Bulletin 123

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ANALYSES OF MINE AND CAR SAMPLES OF COAL COLLECTED IN THE FISCAL YEARS 1913 TO 1916

BY

ARNO C. FIELDNER, HOWARD I. SMITH, J. W. PAUL
AND SAMUEL SANFORD

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ANALYSES OF MINE AND CAR SAMPLES OF COAL COLLECTED IN THE FISCAL YEARS 1913 TO 1916.

By ARNO C. FIELDNER, HOWARD I. SMITH, J. W. PAUL, and SAMUEL SANFORD.

SAMPLING AND ANALYTICAL METHODS.

By ARNO C. FIELDNER.

INTRODUCTION.

Many mine samples of coal are analyzed each year in the laboratories of the Bureau of Mines. The analyses are made in connection with investigations relating to fuels belonging to or for the use of the United States Government, the causes of accidents in coal mines, the geologic relations of coal beds, and the character and the value of the coal and lignite in the public lands. The systematic collection and analysis of such samples in connection with fuel investigations was begun in 1904 at the Government fuel-testing plant at the Louisiana Purchase Exposition, and was under the direction of the United States Geological Survey for six years. Descriptions of the coal samples collected between the beginning of this work, July 1, 1904, and the transfer of the fuel-testing and mine-accident investigations to the Bureau of Mines, July 1, 1910, were compiled and published in Bureau of Mines Bulletin 22.[a] Descriptions and analyses of samples collected during the fiscal years 1911 to 1913 were published in Bureau of Mines Bulletin 85.[b]

The present bulletin presents analyses and descriptions of samples collected during the fiscal years 1913 to 1916. In order that the material in this bulletin may be used to supplement that presented in Bulletins 22 and 85, the same plan of geographical classification has been followed, the analyses and descriptions of the samples being grouped in alphabetical order according to the State, county, and town near which the mines or prospects sampled are situated.

[a] Lord, N. W., and others, Analyses of coals in the United States, with descriptions of mine and field samples collected between July 1, 1904, and June 30, 1910: Bull. 22, Bureau of Mines, 1912, 1,200 pp. (In two parts.)

[b] Fieldner, A. C., and others, Analyses of mine and car samples of coal collected in the fiscal years 1911 to 1913: Bull. 85, Bureau of Mines, 1914, 444 pp.

ACKNOWLEDGMENTS.

Special acknowledgment is due to G. O. Smith, Director of the United States Geological Survey, and to M. R. Campbell, geologist in charge of the economic geology of fuels, for furnishing field descriptions of those samples collected by the geologists of the Survey, and for revising the nomenclature of coal beds and geologic formations.

The mine samples from Kentucky were collected in cooperation with the Kentucky geological survey, under the direction of J. B. Hoeing, State geologist.

The mine samples from Tennessee were collected by Frank R. Clark, of the United States Geological Survey, in cooperation with the State geological survey, under the direction of A. H. Purdue, State geologist. All the Tennessee samples were analyzed at the Pittsburgh laboratory of the Bureau of Mines, with the cooperation and assistance of Paul C. Bowers, chemist of the Tennessee geological survey.

The collection of samples by the fuel-inspection section of the Bureau of Mines was under the direction of G. S. Pope, engineer. Samples designated by the letter W preceding the laboratory number were analyzed in the Washington laboratory of the bureau under the direction of J. D. Davis, chemist.

The collection of mine samples and the gathering of mine data by the field engineers of the Bureau of Mines were under the direction of G. S. Rice, chief mining engineer of the bureau, who also reviewed the descriptions and comments on the methods of field sampling. The descriptions of the mines and the sections of the coal beds were compiled by J. W. Paul, H. I. Smith, and Charles Enzian, mining engineers, assisted by Albert H. Eames, clerk, and Samuel Sanford, engineer. The chemical analyses were made under the direction of A. C. Fieldner, chemist, who was assisted by D. I. Brown and W. A. Selvig, assistant chemists; H. A. Depew, C. W. Davis, R. J. Hamon, V. P. Hawse, H. H. Hill, Corwin Matthews, W. A. Mueller, F. D. Osgood, G. E. Postma, G. H. Mengel, C. A. Taylor, and G. G. Taylor, junior chemists; W. E. Surbled, laboratory assistant; Morris Block, W. E. Demby, and D. A. Grant, laboratory helpers. The assistant junior chemists and laboratory helpers were engaged on coal analyses for varying lengths of time, ranging from one month to two years. The computing and the tabulating of the analyses at the Pittsburgh laboratory were under the direction of Lauson Stone, engineer.

COLLECTION OF SAMPLES.

Samples designated by the letter A in the table of analyses were collected by representatives of the Bureau of Mines, in connection with the investigation of fuels belonging to or for the use of the

Government, and with investigations of accidents in coal mines. Under this designation are also included a number of samples collected by the Bureau of Mines in cooperation with the Kentucky geological survey.

The samples designated by the letter B in the table of analyses were collected by the United States Geological Survey in connection with the study of the geologic relations of coal beds and the classification of public lands. Under this designation are also included a number of samples collected by the United States Geological Survey in cooperation with the Tennessee geological survey.

METHOD OF MINE SAMPLING FOLLOWED BY BUREAU OF MINES.

The method of collecting mine samples by the Bureau of Mines involves selecting a representative face of the bed to be sampled; cleaning the face; making a cut across it from roof to floor, and rejecting or including impurities in this cut according to a definite plan as they are included or excluded in mining operations; reducing this gross sample, by crushing and quartering, to about 3 pounds; and immediately sealing the 3-pound sample in an air-tight container for shipment to the laboratory.[a]

COLLECTION OF CAR SAMPLES.

The carload lots of coal shipped to Pittsburgh for test were sampled by taking definite quantities of coal at regular intervals from a car as it was unloaded, and by reducing to convenient size (about 50 pounds) the gross sample thus obtained. The method of collecting and reducing car samples is given in detail in Bureau of Mines Bulletin 116.[b]

METHOD OF SAMPLING FOLLOWED BY THE UNITED STATES GEOLOGICAL SURVEY.

In collecting mine samples the Geological Survey follows essentially the same method of sampling as that used by the Bureau of Mines. However, in sampling outcrops and prospect holes, or country banks when mining is not in progress, the geologist can not imitate the miner in rejecting or including impurities in the sample, and hence the sample from the cut across the bed includes all partings or bindings less than three-eighths of an inch thick and every concretion or "sulphur ball" having a maximum diameter of less than 2 inches and a thickness of less than one-half inch. All other impurities in the bed are excluded from the sample. Obviously an arbitrary and uniform system of rejecting impurities is necessary for sampling outcrops, prospects, and undeveloped mines.

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[a] Holmes, J. A., The sampling of coal in the mine: Tech. Paper 1, Bureau of Mines, 1911, 18 pp.

[b] Pope, G. S., Methods of sampling delivered coal, and specifications for purchase of coal for the Government: Bull. 116, Bureau of Mines, 1916, 64 pp.

RELATION OF MINE SAMPLES TO COMMERCIAL SHIPMENTS

In comparing analyses of mine samples and those of coal shipped from a mine due allowance must be made for the larger proportion of impurities that may be included in the commercial operation of the mine. It is difficult to take a mine sample in which impurities are rejected in exactly the same manner as is done by the miner. The practice of different miners varies, expecially if rigid inspection at the tipple is not enforced. In some mines, for instance, where the coal bed has friable partings or has a soft, flaky roof or floor, the inclusion of some foreign matter is unavoidable. Hence the analysis of the mine sample usually indicates a better grade of coal as regards ash content and heating value than the actual commercial shipments, and for this reason the mine sample should be considered as representing the coal that can be produced only under the most favorable conditions of mining and preparation.

In commercial shipments that are sampled at their destination the moisture content may be either more or less than that in the mine samples, the relative proportions depending on the amount of bed moisture, the size of the coal, and the weather conditions during transit.

Coals containing 5 per cent or more of moisture tend to lose moisture while in transit, provided no rain or snow falls. Slack coal usually contains more moisture than the mine sample. Low-moisture coals shipped in open cars may gain or lose moisture, depending on weather conditions.[a]

The calorific value, referred to moisture-free and ash-free coal, of samples taken from shipments at destination, tends to be slightly lower than that of the fresh mine samples from the same mine. The deterioration is caused mainly by the freshly exposed surfaces of coal absorbing oxygen from the air. The rate of deterioration varies with the different types of coal and depends on a number of factors, chief of which are: (1) Size of coal, (2) proportion of surface exposed to circulating air, (3) duration of exposure, (4) temperature and humidity.

It is therefore difficult to assign any definite values for deterioration of coal while in transit.[b] A number of mine and car samples tested by the United States Geological Survey and the Bureau of Mines showed the following average losses:

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[a] For a comparison of the moisture, ash, and sulphur contents of mine and car samples tested at the United States fuel-testing plant, St. Louis, Mo., see Burrows, J. S., The importance of uniform and systematic coal-mine sampling: U. S. Geol. Survey Bull. 316, 1907, pp. 490-560. For a discussion of moisture in coal deliveries, see Pope, G. S., Sampling coal deliveries: Bull. 63, Bureau of Mines, 1913, p. 12.

[b] For data on deterioration of coal, see Porter, H. C., and Ovitz, F. K., Deterioration and spontaneous combustion of coal in storage, a preliminary report: Tech. Paper 16, Bureau of Mines, 1912, 14 pp.; Porter, H. C., and Ovitz, F. K., Deterioration in the heating value of coal during storage, Bull 136, Bureau of Mines, 1917, 36 pp.; Parr, S. W., and Wheeler, W. F., The weathering of coal: University of Illinois Eng. Exp. Station Bull. 38, 1909.

Average loss in moisture-free and ash-free calorific value of car sample as compared with that of mine sample.

Kind of coal.	Per cent.
Semibituminous, New River and Pocahontas	0.1
Bituminous, Appalachian field	.3
Bituminous, Illinois, Indiana, and Missouri	.8
Subbituminous and lignite	1.3

ANALYTICAL METHODS.

The methods of analysis and the details of apparatus used by the Bureau of Mines in analyzing coal are fully described in Bulletin 22 [a] and Technical Paper 8 [b] of the Bureau of Mines. They are briefly summarized here, certain changes in minor details, which are fully discussed in Technical Paper 76,[c] being described.

PREPARATION OF LABORATORY SAMPLES.

Immediately after the sealed 3-pound can in which the sample is received at the laboratory has been opened, the contents are transferred to a weighed sheet-metal pan, spread out to a depth of 1 inch, and at once weighed. The pan containing the sample is placed in a large drying oven in which a temperature of 30° to 35° C. is maintained. Through this oven a current of warm air is made to flow by means of an ordinary desk fan mounted on top of the oven, and the sample is dried until the loss in weight between two successive weighings, made 6 to 12 hours apart, does not exceed 0.5 per cent. The total loss of weight is reported as "air-drying loss."

Immediately after the last weighing has been made the entire sample is quickly pulverized to 10-mesh size by being passed through a roll crusher. After having been mixed, the 10-mesh material is reduced with a riffle sampler to 500 grams. This 500-gram part is at once transferred to the porcelain jar of an Abbe ball mill, which is sealed air-tight and rotated at the rate of 60 revolutions per minute until the coal is pulverized to 60-mesh size.

This 60-mesh coal is emptied on a one-half-inch screen, which is vigorously shaken to detach the coal from the pebbles. The sample (approximately 500 grams) is then reduced to the final laboratory sample of approximately 60 grams by successive halvings with a small riffle sampler. The final sample is put through the 60-mesh sieve and at once transferred to a 4-ounce wide-mouthed bottle, which is securely closed with a well-fitting rubber stopper. Any particles of coarse material remaining on the sieve are carefully

[a] Lord, N. W., and others, Analyses of coals in the United States, with descriptions of mine and field samples collected between July 1, 1904, and June 30, 1910: Bull. 22, Bureau of Mines, 1913, pp. 10–26.

[b] Stanton, F. M., and Fieldner, A. C., Methods of analyzing coal and coke: Tech. Paper 8, Bureau of Mines, 1913, 42 pp.

[c] Fieldner, A. C., Notes on the sampling and analysis of coal: Tech. Paper 76, Bureau of Mines, 1914, pp. 14–58.

rubbed down to 60-mesh size on a bucking board and are thoroughly mixed with the sample in the bottle.

This air-dried sample is used in all analytical determinations.

DETERMINATION OF MOISTURE.

The residual moisture in the air-dried sample is determined by heating 1 gram in a shallow porcelain capsule, seven-eighths of an inch deep and $1\frac{3}{4}$ inches in diameter, for one hour at 105° C. in a constant-temperature oven through which a current of dry preheated air is rapidly passing. The air is dried by being passed through concentrated sulphuric acid. The covered capsule is cooled in a desiccator over sulphuric acid and then weighed. The loss in weight is called "moisture at 105°" in the air-dried coal.

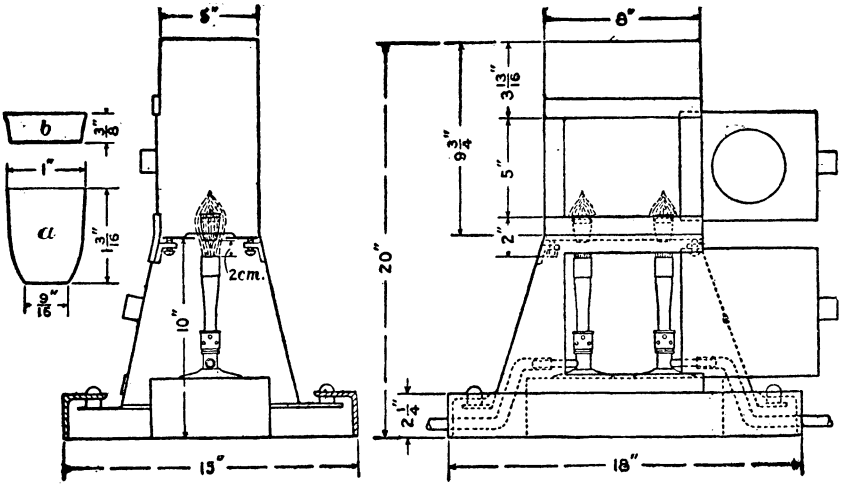


FIGURE 1.—100-c. c. platinum crucible for determining volatile matter.

ASH DETERMINATION.

The same sample is used for determining ash as was previously used for determining moisture. A porcelain capsule containing the sample is placed in a cool muffle and the temperature is gradually raised to approximately 750° C. The ignition in the muffle is continued, with occasional stirring of the ash, until all particles of carbon have disappeared. After the capsule containing the ash has been cooled in a desiccator it is weighed and ignition is repeated until constant weight (0.0005 gram or less) has been attained.

The ash content as determined by this method represents the ignited mineral residue or "uncorrected ash."

DETERMINATION OF VOLATILE MATTER.

METHOD.

A 1-gram sample of the fine (60-mesh) coal is weighed into a bright, well-burnished, 10-gram (10 c. c.) platinum crucible, *a* (fig. 1), with a

close-fitting capsule cover, *b*. The crucible and contents are heated to a temperature of 950° C. in a specially designed electric furnace of

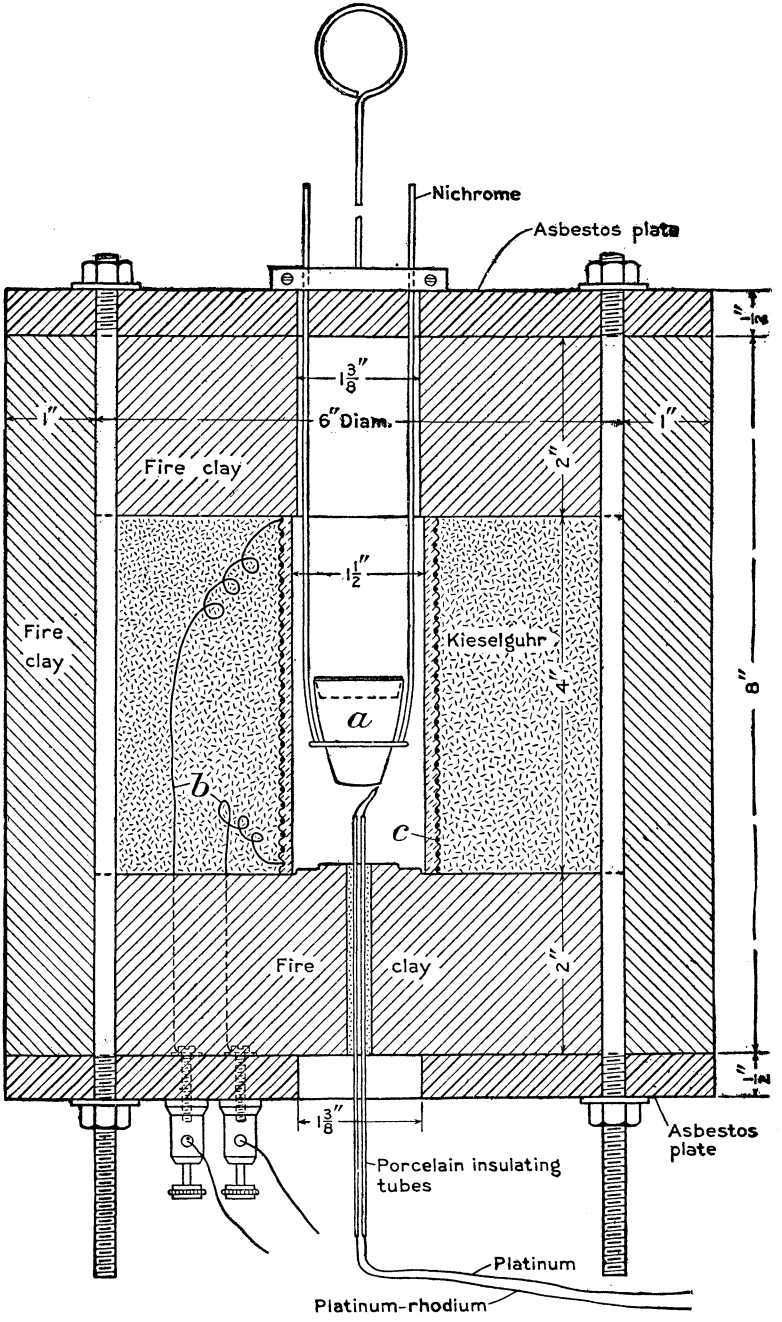


FIGURE 2.—Electric furnace for volatile-matter determination.

the vertical type (fig. 2). After having been heated exactly seven minutes the crucible is removed from the flame, cooled, and weighed.

The loss in weight minus the weight of moisture determined at 105° C. times 100 equals the percentage of volatile matter.

MODIFIED METHOD FOR LIGNITES AND SUBBITUMINOUS COALS.

Lignites and coals high in moisture are heated at a low temperature with a flame until all the moisture is driven out in order to avoid mechanical losses from material thrown out of the crucible by the rapid escape of steam and volatile matter.[a] After this preliminary heating for four to six minutes the crucible is placed at once in the furnace at 950° C., and is heated for six minutes.

It should be clearly understood that the volatile matter does not represent any definite compound in the coal. The method of determination is wholly conventional, and any variation in temperature or rate of heating will change the amount of volatile matter determined.

USE OF THE ELECTRIC FURNACE.

Since February 26, 1913, all volatile-matter determinations at the bureau's laboratory in Pittsburgh have been made in specially designed electric furnaces of the vertical type (fig. 2). Two of these furnaces are connected in series and are controlled by a single rheostat. A current of 8 to 9 amperes is required to maintain the temperature of each furnace at 950° C. Under these conditions the drop in potential across the two furnaces is 60 volts. The life of the heating element under daily operation has been six to eight months. Each furnace contains a platinum platinum-rhodium thermocouple that is connected to a millivoltmeter through a double-pole, double-throw switch. The position of the hot junction in each furnace is so adjusted that the direct reading of the temperature scale of the millivoltmeter is the same as the maximum temperature attained inside the crucible as determined by another standardized couple whose hot junction is in contact with the bottom of the interior of the crucible. In making this comparison a nickel cover perforated for admitting the thermocouple leads is substituted for the usual platinum cover of the crucible. To avoid possible contamination of the thermocouple, 1 gram of ignited silica or alumina is used instead of coal.

DETERMINATION OF FIXED CARBON.

The fixed-carbon content of the sample is determined by calculation—by subtracting the sum of the percentages of moisture, ash, and volatile matter from 100.

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[a] Lord, N. W., Experimental work conducted in the chemical laboratory of the United States fuel-testing plant at St. Louis, Mo.: U. S. Geol. Survey Bull. 323 (reprinted as Bull. 28, Bureau of Mines), pp. 6–7.

SULPHUR DETERMINATION.

Sulphur is determined by the Eschka method. A 1.3737-gram part of the air-dried coal is mixed with 6 grams of Eschka mixture in a No. 1 porcelain crucible and gradually heated in a muffle, with free access of air, until all the carbon has been consumed. The sulphur is extracted with hot water, completely oxidized to sulphate with bromine water, and precipitated and weighed as barium sulphate.

DETERMINATION OF CARBON AND HYDROGEN.

Carbon and hydrogen are determined by the usual method of combustion in a current of oxygen. A 0.2-gram part of the air-dried coal is burned in an electrically heated furnace of the Heraeus type. Complete oxidation is insured by passing the products of combustion over red-hot copper oxide. A layer of lead chromate, following the copper oxide, removes the sulphur. The water and carbon dioxide are absorbed and weighed in calcium chloride and potassium hydroxide solution respectively. No correction is made for carbon or hydrogen from inorganic matter in the coal.

NITROGEN DETERMINATION.

Nitrogen is determined by the Kjeldahl-Gunning method. One gram of the air-dried coal is digested with 30 c. c. of concentrated sulphuric acid, 0.5 gram of metallic mercury, and 5 grams of potassium sulphate, until the carbon has been completely oxidized and all the nitrogen has been converted to ammonium sulphate. After dilution with water and precipitation of the mercury by the addition of potassium sulphide an excess of sodium hydroxide is added and the ammonia determined by distillation.

DETERMINATION OF CALORIFIC VALUE.

The heat of combustion is determined with the bomb calorimeter. One gram of the air-dried coal is completely burned in compressed oxygen gas and the total heat evolved is absorbed in a weighed quantity of water in which the bomb is immersed. The rise in temperature of the water is measured with a thermometer that is graduated in hundredths of 1° C., and can be read, by means of a cathetometer, to 0.002° C.

Corrections are made for "radiation losses," oxidation of nitrogen to aqueous nitric acid, and oxidation of sulphur dioxide to aqueous sulphuric acid. The calorific value obtained in this manner is the total heat of combustion with water vapor condensed to liquid water at the temperature of the calorimeter, that is, 20° to 25° C.

INTERPRETATION OF ANALYTICAL RESULTS.[a]

The coal analyses reported in this bulletin are grouped in the usual manner, as follows:

1. The proximate analysis, including results of determinations of moisture, volatile matter, fixed carbon, and ash.
2. The ultimate analysis, including results of determinations of carbon, hydrogen, nitrogen, oxygen, sulphur, and ash.
3. The calorific value, heating value, or heat of combustion.

For many of the samples the analysis is given for three conditions, as follows: (1) As received at the laboratory, (2) computed to a moisture-free condition, and (3) computed to a moisture-free and ash-free condition.

At mines where two or more samples were taken and a composite sample obtained by mixing equal portions of the separate samples the analysis of the composite sample is given for the three conditions, because presumably the composite sample represents the coal in the mine better than any one of the separate samples.

The analysis of the sample "as received" (condition 1) represents the actual sample as received at the laboratory and, as for a mine sample, represents the coal at the point of sampling in the mine. The "moisture-free" analysis (condition 2) represents the relative composition and heating value of the dry coal; this form of analysis is convenient for comparing similar coals of variable moisture content. The "moisture-free and ash-free" analysis represents approximately the relative composition and calorific value of the dry organic or combustible matter. This form of analysis is only an approximation, because the ash does not have the same weight as the inorganic or incombustible matter in the coal. However, the error does not exceed 1.5 per cent in comparing coals that do not vary much in the character and amount of ash and sulphur.

PROXIMATE ANALYSIS.

The proximate analysis of coal originated in response to the industrial demand for laboratory tests of the relative amounts of certain compounds, either present in the coal or derived from it, that affect its use as a fuel. These compounds are grouped by the proximate analysis as follows:

(1) Water or moisture; (2) mineral impurities that remain in a somewhat altered condition as ash when the coal is burned; (3) organic or combustible matter, which is approximately represented by the volatile matter and fixed carbon.

[a] See also, Fieldner, A. C., Notes on the sampling and analysis of coal: Tech. Paper 76, Bureau of Mines, 1914, pp. 23-57.

MOISTURE CONTENT.

The moisture in coal consists of (1) extraneous moisture, which comes from external sources, such as underground waters trickling over the face of the coal bed, through the coal bed, and, in places going down the dip, from the coal shot down lying in water, condensation from saturated mine air, or, as regards car samples, from atmospheric precipitation or from water used for washing the coal, and (2) inherent moisture, which is one of the products of the original vegetable matter from which coal is derived.

Analysis does not differentiate between extraneous and inherent moisture, because in air-drying coal not only is the extraneous or superficial moisture removed but also more or less of the inherent moisture, the amount depending on the fineness of the coal and the humidity of the air. The percentage loss of weight on air drying should be regarded merely as an indication of the relative tendency of different coals to lose moisture, after removal from the mine, on exposure to comparatively dry atmospheres.

The loss of weight on air drying at 30–35° C., combined with the loss of weight occurring when the air-dried sample is heated in a current of dry air at a temperature of 105° C., is considered equal to the total moisture in the coal as received at the laboratory.

ASH.

Ash is the incombustible residue left from complete combustion of the coal. It is derived from the inorganic matter in the coal, and is composed largely of compounds of silica, alumina, lime, and iron, together with smaller quantities of magnesia, titanium, and alkali compounds. The silica, alumina, and titanic oxide are derived from sand, clay, shale, and "slate"; the iron oxide mainly from iron pyrite; and the lime and magnesia from their corresponding carbonates and sulphates.

The ash-forming constituents consist of (1) "inherent" or "intrinsic" impurities that are present in an intimate mixture with the coal substance, and are derived either from the original vegetable material or from external sources during the accumulation of coal-forming plant remains; (2) impurities formed either during the laying down of the coal bed or subsequently, which occur in the form of partings, "veins," and nodules of clay, shale, pyrite, and calcite; and (3) impurities that become mechanically mixed with the coal in the process of mining, such as fragments of roof and floor.

INHERENT IMPURITIES.

The percentage of ash derived from the intimately mixed impurities may be determined by selecting a sample of clean lumps of homogeneous coal, or, better, by placing the coarsely crushed coal in a

solution of calcium or zinc chloride with a specific gravity of 1.35. The coal will float and the heavier extraneous impurities will sink. In this way a sample of clean coal may be prepared for analysis. In some samples the percentage of "intrinsic" ash is so low that the ash must have come exclusively from the original coal-forming vegetation. Certain coals have deposited in their minute joints or cleavage planes thin flakes of calcite, gypsum, silica, or clay, and some have veinlets of pyrite. These impurities are not intimately mixed with the coal substance, but can not be separated from the coal by any commercial methods of preparation. In some coals, also, microscopic crystals of pyrite are so distributed that washing does not appreciably lower the sulphur content.

EXTRANEOUS IMPURITIES.

The percentage of ash derived from extraneous impurities varies considerably, depending on the number and size of the partings in the bed, the possibility of separating them from the coal, and the care with which the coal is mined. Such impurities of this character, when in the form of "slate" or bone, may be removed to some degree by suitable methods of washing, picking, or screening. The possibility of improving the quality of coal by washing may be determined by the laboratory float-and-sink test already described.

Coal ash, as determined, usually weighs less than the organic matter from which it is produced because of the loss of volatile constituents during ignition. Shale and clay lose their water of hydration; the carbonates are more or less decomposed, giving off carbon dioxide; the iron pyrite is changed to ferric oxide, giving off sulphur dioxide either to the atmosphere or to the free calcium oxide that has been formed from the carbonate. In coals containing calcium carbonate a large proportion of the sulphur may be retained in the ash as calcium sulphate.

VOLATILE MATTER AND FIXED CARBON.

The volatile matter and fixed carbon represent approximately the relative proportions of gaseous and solid combustible matter that are obtained from coal by heating it in a closed vessel. The volatile matter consists chiefly of the combustible gases hydrogen, carbon monoxide, and methane and other hydrocarbons, and some noncombustible gases, as carbon dioxide and water vapor. The volatile matter does not include the water that can be removed from the coal by heating it at 105° C.

From the standpoint of the analyst, 950° to 1,000° C. appears to be the best temperature for the determination of volatile matter, as most duplicate determinations made within those limits agree within 0.5 per cent.

The residue of coke left in the crucible after the ash has been deducted is reported as "fixed carbon." The fixed carbon does not represent the total carbon in the coal, for a considerable part of the carbon is expelled as volatile matter, being in combination with hydrogen as hydrocarbon or with oxygen as carbon monoxide and carbon dioxide. Furthermore, fixed carbon is not pure carbon. The carbonized residue contains, in addition to the ash-forming constituents, several tenths per cent of hydrogen and oxygen, from 0.4 to 1.0 per cent nitrogen, and approximately half the sulphur that was in the coal. The terms "volatile matter" or "volatile combustible matter" and "fixed carbon" do not represent definite compounds that existed in the coal before heating. The method of determination is arbitrary, and results are comparable only when the temperature and rate of heating are the same. In general the sum of the fixed carbon and ash may be taken as representing the relative amount of coke yield from coking coals. However, the conditions under which the laboratory determination is made are so different from the conditions in the commercial manufacture of coke or gas that no close agreement can be expected. The slow rate of heating in the industrial processes yields several per cent more coke than is obtained in the laboratory determination.

SULPHUR.

In the proximate analysis of coal the sulphur is included in the volatile matter, fixed carbon, and ash. If the ash contains no lime or alkali oxides, all the sulphur is distributed between the volatile matter and fixed carbon, approximately half the sulphur being retained by the fixed carbon and the remainder escaping with the volatile matter.

FORMS OF OCCURRENCE IN COAL.

Sulphur occurs in coal (1) as pyrite or marcasite, (2) as sulphate of iron, lime, and alumina, and (3) in combination with the coal substance as organic compounds.

In some coal beds the balls, lenses, and bands of pyrite are easily distinguishable in the face of the bed, and may be largely removed by breaking up the lumps of coal containing them and by suitable washing or picking. In other beds the pyrite is disseminated throughout the lumps of coal in veinlets or in such small particles that it is not practicable to separate them from the lump coal or even to remove them from the screenings by washing.

Sulphur combined as sulphates of iron, lime, and alumina may be found in weathered coal. On exposure to air, pyrite and marcasite tend to absorb oxygen and form iron sulphate. Sulphur combined as sulphate has no heating value.

Next to pyritic sulphur the most prominent form of sulphur in coal is that which occurs in some organic combination with the coal substance. There is no direct method of quantitatively determining the relative amounts of pyritic and "organic" sulphur. However, as regards many coals, if all the sulphate sulphur and an amount of sulphur sufficient to form pyrite equivalent to all the iron in the coal be deducted from the total sulphur, there yet remains a considerable amount of sulphur.

ULTIMATE ANALYSIS.

In the ultimate analysis the composition of coal is expressed in percentages of ash, sulphur, carbon, hydrogen, nitrogen, and oxygen. The sum of these constituents is taken as equal to 100 per cent. As there is no simple direct method for the determination of oxygen, it is estimated by subtracting the sum of the other five constituents from 100. This method throws the summation of all the errors incurred in the other determinations upon the oxygen.

The determination of carbon, hydrogen, and nitrogen, although requiring experience and a considerable degree of skill on the part of the chemist, is not subject to the arbitrary conditions that must be maintained in the proximate analysis. As the chemist is dealing with definite chemical elements, he should be able to make duplicate determinations, agreeing within the following limits: Carbon, 0.3 per cent; hydrogen, 0.07 per cent; nitrogen, 0.05 per cent.

CALORIFIC VALUE.

DIRECT DETERMINATION IN THE BOMB CALORIMETER.

The most accurate method of determining the total heating value is by combustion in a bomb calorimeter. The instrument should be carefully standardized by burning substances of known calorific value, such as the standard samples of cane sugar, naphthalene, and benzoic acid, that are now being furnished by the Bureau of Standards. The standardization should be conducted under exactly the same conditions and with the same thermometer that is used in the tests. The use of calibrated thermometers is essential. In carefully conducted calorimetric work the probable error should not exceed 0.2 per cent, which corresponds to about 30 B. t. u. in a high-grade coal. This degree of accuracy is higher than can be obtained in the usual methods of sampling, the error introduced by which oftentimes increases the total error to 100 B. t. u.

CALCULATION OF CALORIFIC VALUE BY DULONG'S FORMULAS.

Before the bomb calorimeter came into general use the heating value of a coal was frequently calculated from the ultimate analysis by one of Dulong's formulas. These formulas, which are occasionally used in the bureau's work to verify results with the bomb calorimeter, are as follows:

(1) Calorific value in calories per gram $= 8080C + 34460\left(H - \frac{O}{8}\right) + 2250S$.

(2) Calorific value in B. t. u. per pound $= 14544C + 62028\left(H - \frac{O}{8}\right) + 4050S$.

There is a fairly close agreement between the calorific values calculated by Dulong's formula and those determined by the calorimeter. In coals of higher rank than subbituminous the agreement is usually within 1.5 per cent.

DESCRIPTIONS OF SAMPLES.

The samples of coal and the mines from which they were taken are described in the same general manner as the corresponding information was presented in Bulletin 22. The descriptions have been compiled from published reports or from the note books of the engineers or geologists who collected the samples and necessarily vary in completeness. The purpose of the descriptions is to present such information as bears on the significance of the analyses and to give supplementary details, such as methods of mining and cleaning coal, that may be of assistance to Government engineers or purchasing agents and to other persons in preparing specifications and awarding contracts for fuel.

The names of the coal beds, geologic formations, mining districts, and coal fields are those used by the United States Geological Survey. In the descriptions of the sections of coal beds, the word "shale" has been substituted for the "slate" of collectors and "bony coal" or "bone" for "bone coal."

CLASSIFICATION OF COAL.

The usage of the Survey has been followed also in the classification of the coals. The following statement on coal classification is made by Campbell [a] in a recent report:

The classification of coal into various grades, such as bituminous, semibituminous, and lignite, is arbitrary and not at all satisfactory, but it is in common use in the United States, and it seems desirable to give the class for each sample, because from the analysis one could not always determine this important point. The classes generally

[a] Campbell, M. R., Analyses of coal samples from various fields in the United States: U. S. Geol. Survey Bull 541, 1914, pp. 491–526.

used in the United States are as follows: Anthracite, semianthracite, semibituminous, bituminous, subbituminous, and lignite.

Anthracite.—Anthracite is generally well known, but in a systematic classification it is generally defined as a hard coal having a fuel ratio (fixed carbon divided by volatile matter) of not less than 10. Most of this coal comes from the anthracite fields of eastern Pennsylvania, but small areas are known in some of the Western States.

Semianthracite.—Semianthracite coal has a fuel ratio ranging from 6 or 7 to 10. There is only a small amount of this coal in the United States.

Semibituminous.—Semibituminous coal is of great commercial importance, but is not widely distributed. Its fuel ratio ranges from 3 to 6 or 7. It is the best steam coal in the country, and some of it can be utilized in the manufacture of coke. The centers of production are the Pocahontas and New River fields of Virginia and West Virginia, Georges Creek field of Maryland, Windber field of Pennsylvania, and the western end of the Arkansas field in the vicinity of Fort Smith. Though small areas containing this grade of coal have been found in Washington and Colorado, the amount of such coal in these fields is small.

Bituminous.—Bituminous coal is the most important grade in the country and includes most of the coals east of the Rocky Mountains. In the Western States there are large areas of bituminous coal, such as the Trinidad-Raton field of Colorado and New Mexico; the Grand Hogback field of Colorado; the Book Cliffs field of Utah; the Rock Springs, Kemmerer, and Black Hills fields of Wyoming; the Great Falls field of Montana; and many districts of Washington. This grade furnishes most of the coking coal of the country, and it is largely sold for steam raising and for domestic use.

Subbituminous.—The term "subbituminous" has been adopted by the United States Geological Survey for what has generally been called "black lignite." The latter term is objectionable, for the reason that the coal is not lignitic in the sense of being woody, and the use of the term seems to imply that the coal is little better than the brown, woody lignite of North Dakota, whereas many of the coals of this class closely approach the lowest grade of bituminous coal. In fact, it is extremely difficult to separate this class from the one below and the one above. It is generally distinguished from lignite by its color and freedom from apparent woody texture and from bituminous coal by the slacking it undergoes when exposed to the weather. As the latter is an important difference in commercial use, it has been adopted by the Geological Survey as the criterion for the separation of subbituminous and bituminous coals.

Subbituminous coal is found in most of the western fields, being well known in the field about Boulder and Denver and in North Park, Colo.; Gallup, N. Mex.; Hanna, Douglas, Sheridan, and the Bighorn Basin, Wyo.; Red Lodge and Musselshell, Mont., and in many of the districts of Washington and Oregon.

Lignite.—As used by the Geological Survey the term "lignite" is restricted to the coals that are distinctly brown and generally woody. They are intermediate in quality between peat and subbituminous coal. Lignite is abundant in the North in eastern Montana and North Dakota and in the northwest corner of South Dakota. In the South it is present in all of the Gulf States, but it has been developed commercially only in Texas.

TABULATED ANALYSES.

On the following pages are given the analyses of the samples of coal collected during the period covered by this report.

In the first column of the table, locations of samples are, for brevity, not worded as in the detailed descriptions (pp. 132–439).

Table of chemical analyses.

Locality, bed, etc.	Mine notes[a] (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.[b]	Kind.[c]	Condition.[d]	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
ALABAMA.																
BIBB COUNTY.																
Coleanor; sec. 1, T. 24 N., R. 10 E.; Coleanor mine, Thompson bed (face of 37 room, 10 north entry).	.....	20132	A	1	2.67	36.32	52.88	8.13	0.62	.....	.....	.....	.....	1.4	7,363	13,255
Same (face of 41 room, 13 north entry)	.....	20133	A	1	2.74	36.51	53.01	7.74	.61	.....	.....	.....	.....	1.5	7,383	13,289
Same (face of 14 north entry)	.....	20134	A	1	3.04	36.42	52.68	7.86	.50	.....	.....	.....	.....	1.7	7,349	13,228
Same (face of 13 south entry)	.....	20142	A	1	3.31	36.02	52.42	8.25	.51	.....	.....	.....	.....	1.8	7,312	13,162
Same (composite of samples 20132, 20133, 20134, and 20142)	.....	20135	A	1	2.89	36.24	52.92	7.95	.55	5.13	75.25	1.13	9.99	1.6	7,344	13,219
				2	.....	37.32	54.49	8.19	.57	4.95	77.49	1.16	7.64	.....	7,563	13,613
				3	.....	40.65	59.35	.....	.62	5.39	84.40	1.26	8.33	.....	8,238	14,828
Garnsey; sec. 7, T. 22 S., R. 4 W.; Garnsey mine, Thompson bed (4,700 feet southeast of pit mouth).	.....	25431	A	1	3.01	33.20	52.61	11.18	.48	.....	.....	.....	.....	1.5	7,152	12,874
Same (8,000 feet southeast of pit mouth)	.....	25432	A	1	2.41	33.09	52.38	12.12	.45	.....	.....	.....	.....	1.1	7,098	12,776
Same (5,000 feet southwest of pit mouth)	.....	25433	A	1	2.07	34.46	52.59	10.88	.52	.....	.....	.....	.....	.7	7,268	13,082
Same (composite of samples 25431, 25432, and 25433)	.....	25434	A	1	2.45	34.10	52.12	11.33	.48	5.00	73.05	1.00	9.14	1.1	7,175	12,915
				2	.....	34.96	53.43	11.61	.49	4.87	74.88	1.03	7.12	.....	7,355	13,239
				3	.....	39.55	60.45	.....	.55	5.51	84.72	1.17	8.05	.....	8,321	14,978
Marvel; sec. 7, T. 22 S., R. 4 W.; Marvel mine, Clark bed (face of 15 left entry, about 5,400 feet southeast of pit mouth.	.....	25379	A	1	1.63	36.79	55.28	6.30	.73	.....	.....	.....	.....	.4	7,830	14,094
Same (face of 8 right entry, about 3,000 feet south of pit mouth).	.....	25380	A	1	2.40	36.52	54.87	6.21	.71	.....	.....	.....	.....	1.1	7,698	13,856
Same (face of 15 room, 8 right entry, 1 panel, 2,000 feet south of pit mouth).	.....	25381	A	1	2.31	36.26	53.82	7.61	.53	.....	.....	.....	.....	.9	7,539	13,570
Same (face of 9 left entry, about 4,000 feet east of pit mouth)	.....	25384	A	1	2.50	35.40	54.05	8.05	.61	.....	.....	.....	.....	1.0	7,561	13,610
Same (composite of samples 25379, 25380, 25381, and 25384)	.....	25382	A	1	2.16	36.66	54.04	7.14	.69	5.24	77.04	1.14	8.75	.9	7,649	13,768
				2	.....	37.47	55.23	7.30	.71	5.11	78.74	1.17	6.97	.....	7,818	14,072
				3	.....	40.42	59.58	.....	.77	5.51	84.94	1.26	7.52	.....	8,433	15,179

[a] Figures in column 2 refer to page of this bulletin where may be found the description of the section in the mine where the sample was taken.

[b] Laboratory numbers with a prefix "W" represent samples analyzed in the Washington laboratory of the bureau; all others were analyzed at the Pittsburgh laboratory. An asterisk preceding the laboratory number indicates that the volatile matter was determined by the modified method (see p. 8).

[c] The kind of sample is denoted by letter, as follows: A=mine sample collected by an inspector of the Bureau of Mines; B=mine sample collected by a geologist of the United States Gelogical Survey; C=car sample taken at the fuel-testing plant.

[d] The form of analysis is denoted by number, as follows: 1=sample as received; 2=dried at a temperature of 105° C.; 3=moisture and ash free.

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes [a] (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
ALABAMA—Continued.																
BIBB COUNTY—continued.																
Piper; sec. 2, T. 24 N., R. 10 E.; Piper No. 1 mine, Thompson bed (face of 20 east entry).	.....	25383	A	1	2.73	36.69	54.51	6.07	0.48	.....	.....	.....	.....	0.8	7,527	13,549
Same (face of 21 west air course)	.....	25385	A	1	2.48	36.86	55.08	5.58	.32	.....	.....	.....	.....	.4	7,564	13,615
Same (face of 31 room, 5 west entry)	.....	25386	A	1	3.51	35.99	52.92	7.58	.62	.....	.....	.....	.....	1.3	7,269	13,084
Same (composite of samples 25383, 25385, and 25386)	.....	25387	A	1	2.85	36.80	53.77	6.58	.49	5.14	75.82	1.10	10.87	.8	7,439	13,390
				2	.....	37.88	55.35	6.77	.50	4.96	78.04	1.13	8.60	.....	7,657	13,783
				3	.....	40.63	59.37	.....	.54	5.32	83.71	1.21	9.22	.....	8,213	14,783
DEKALB COUNTY.																
Blanche, 1 mile west of; sec. 31, T. 7 S., R. 10 E., Underwood prospect pit (10 feet from opening).	.....	18232	B	1	3.51	20.61	64.82	11.06	2.64	.....	.....	.....	.....	3.0	.....	.....
				2	.....	21.36	67.18	11.46	2.74	.....	.....	.....	.....	.....	.....	.....
				3	.....	24.12	75.88	.....	3.09	.....	.....	.....	.....	.....	.....	.....
3 miles northwest of; Yellow Creek mine, Yellow Creek bed (300 feet south of opening; surface coal).	.....	18230	B	1	3.58	19.03	65.91	11.48	1.44	.....	.....	.....	.....	2.6	.....	.....
				2	.....	19.74	68.35	11.91	1.49	.....	.....	.....	.....	.....	.....	.....
				3	.....	22.41	77.59	.....	1.69	.....	.....	.....	.....	.....	.....	.....
Same (coal 20 inches below surface)	.....	18233	B	1	3.38	18.67	63.41	14.54	1.22	4.29	72.86	1.27	5.82	2.8	7,056	12,701
				2	.....	19.32	65.63	15.05	1.26	4.05	75.41	1.31	2.92	.....	7,303	13,145
				3	.....	22.74	77.26	.....	1.48	4.77	88.77	1.54	3.44	.....	8,597	15,475
Same (coal 12 inches below surface)	.....	18234	B	1	3.80	18.99	64.45	12.76	1.52	.....	.....	.....	.....	2.9	7,213	12,983
				2	.....	19.74	67.00	13.26	1.58	.....	.....	.....	.....	.....	7,498	13,496
				3	.....	22.76	77.24	.....	1.82	.....	.....	.....	.....	.....	8,644	15,559
Fort Payne, 1 mile northeast of; see 24, T. 7 S., R. 9 E.; Beeson Gap mine, Yellow Creek bed (200 feet north-east of mine mouth).	.....	18231	B	1	2.77	20.23	60.63	16.37	4.43	.....	.....	.....	.....	2.2	.....	.....
				2	.....	20.81	62.35	16.84	4.56	.....	.....	.....	.....	.....	.....	.....
				3	.....	25.02	74.98	.....	5.48	.....	.....	.....	.....	.....	.....	.....
JEFFERSON COUNTY.																
Docena; Docena mine, Pratt bed (face of southeast slope)	.....	W46918	A	1	1.90	30.50	63.50	4.10	1.00	.....	.....	.....	.....	.....	8,106	14,590
Same (face of 20 room, 5 right entry, main south slope)	.....	W46919	A	1	1.90	31.50	62.80	3.80	1.35	.....	.....	.....	.....	.....	8,133	14,640
Same (face of main south slope air course)	.....	W46920	A	1	1.70	30.80	62.50	5.00	1.45	.....	.....	.....	.....	.....	8,033	14,460

Same (face of 52 room, 2 left entry, southeast slope)	W46921	A	1	1.90	31.60	61.60	4.90	1.40						8,017	14,431
Same (face of 7 left entry, main south slope)	W46922	A	1	.80	31.50	62.90	4.80	1.35						8,167	14,700
Same (composite of samples W46918, W46919, W46920, and W46921)	19645	A	1	1.66	30.43	63.29	4.62	1.40	5.13	81.53	1.55	5.77		8,114	14,605
			2		30.94	64.36	4.70	1.42	5.03	82.91	1.58	4.36		8,251	14,852
			3		32.47	67.53		1.49	5.28	87.00	1.66	4.57		8,668	15,584
Same (car sample)	W46544	C	1	1.00	29.70	62.50	6.80	1.48						7,996	14,320
	W46545		2		30.60	63.15	6.85	1.50						8,036	14,465
			3		32.20	67.80		1.61						8,627	15,529
Ensley (Birmingham); Pratt No. 4 mine, Pratt bed (face of 10 room, A west entry).	W46826	A	1	.70	32.80	60.90	5.60	1.60						8,078	14,540
Same (8 room, 10 cross entry, back slope)	W46827	A	1	2.80	31.90	60.10	5.20	.65						7,861	14,150
Same (17 room, 35 west entry)	W46828	A	1	1.40	32.20	59.80	6.60	1.90						7,911	14,240
Same (1 room, 13 cross entry, back slope)	W46831	A	1	1.80	33.50	56.90	7.80	.85						7,706	13,870
Same (1 room, 42 east cross entry)	W46832	A	1	1.90	30.90	61.00	6.20	1.95						7,922	14,260
Same (composite of samples W46826, W46827, W46831, and W46832).	19641	A	1	1.70	31.27	60.77	6.26	1.47	5.13	79.75	1.60	5.79		7,941	14,294
			2		31.81	61.82	6.37	1.50	5.03	81.13	1.63	4.34		8,078	14,540
			3		33.97	66.03		1.60	5.37	86.65	1.74	4.64		8,627	15,529
Same (car sample)	W46527	C	1	1.05	31.37	61.49	6.09	1.37						7,986	14,375
	W46528		2		31.70	62.15	6.15	1.38						8,072	14,530
			3		33.78	66.22		1.47						8,603	15,485
Mulga, 2½ miles northeast of; Edgewater mine, Pratt bed (face of 6 east entry, 1 south-heading).	W46660	A	1	1.80	30.20	62.30	5.70	1.55						7,967	14,340
Same (face of 2 south entry, main west-heading)	W46661	A	1	2.90	29.30	62.60	5.20	1.40						7,950	14,310
Same (face of 7 west entry, 1 south-heading)	W46662	A	1	2.30	30.70	61.50	5.50	1.75						7,945	14,300
Same (face of 2 west entry, 1 north-heading)	W46663	A	1	1.60	29.80	63.30	5.30	1.35						8,045	14,480
Same (face of 2 north entry, main west-heading)	W46664	A	1	2.20	29.70	62.10	6.00	1.55						7,928	14,270
Same (face of 6 east entry, 2 north-heading, bottom level)	W46691	A	1	2.00	28.90	62.40	6.70	1.90						7,867	14,160
Same (face of main south-heading, bottom level)	W46692	A	1	3.40	30.50	60.30	5.80	1.35						7,828	14,090
Same (face of 20 room, 1 left entry, main south-heading, bottom level).	W46693	A	1	2.20	29.30	61.90	6.60	1.00						7,861	14,150
Same (face of 1 east entry, 2 north-heading, bottom level)	W46694	A	1	2.10	29.40	61.50	7.00	1.35						7,834	14,100
Same (face of 6 west entry, 2 north-heading, bottom level)	W46695	A	1	1.50	29.90	61.70	6.90	1.55						7,895	14,210
Same (composite of samples W46660, W46661, W46662, W46663, W46664, W46691, W46692, W46693, W46694, and W46695).	19643	A	1	2.20	28.83	62.88	6.09	1.62	5.10	79.89	1.56	5.74		7,909	14,236
			2		29.48	64.29	6.23	1.66	4.97	81.69	1.59	3.86		8,087	14,557
			3		31.44	68.56		1.77	5.30	87.11	1.70	4.12		8,624	15,523
Same (car sample, screened coal being loaded at mine)	W46288	C	1	1.10	29.70	63.40	5.80	1.68						8,047	14,484
	W46289		2		30.05	64.20	5.85	1.70						8,136	14,645
			3		31.90	68.10		1.81						8,642	15,555
Same (car sample, screened coal being loaded at mine)	W46294	C	1	1.10	29.40	63.30	6.20	1.68						8,033	14,459
	W46295		2		29.70	64.00	6.30	1.70						8,122	14,620
			3		31.70	68.30		1.81						8,669	15,603
Same (car sample, screened coal being loaded at mine)	W46342	C	1	.80	29.60	63.60	6.00	1.74						8,046	14,483
	W46343		2		29.85	64.10	6.05	1.75						8,111	14,600
			3		31.80	68.20		1.86						8,634	15,540
Same (car sample, screened coal being loaded at mine)	W46344	C	1	.70	29.50	63.10	6.70	1.67						7,991	14,384
	W46345		2		29.75	63.50	6.75	1.68						8,047	14,485
			3		31.90	68.10		1.80						8,630	15,534
Same (car sample, screened coal being loaded at mine)	W46346	C	1	.90	29.50	63.90	5.70	1.54						8,080	14,543
	W46347		2		29.75	64.60	5.75	1.55						8,153	14,675
			3		31.60	68.40		1.64						8,650	15,570

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
ALABAMA—Continued.																
JEFFERSON COUNTY—continued.																
Mulga, 2½ miles northeast of; Edgewater mine, Pratt bed (car sample, screened coal, being unloaded).	.....	W46546	C	1	1.25	29.30	63.10	6.45	1.53	.....	.....	.....	.....	.....	7,999	14,398
		W46547		2	.....	29.65	63.95	6.50	1.55	.....	.....	.....	.....	.....	8,092	14,565
				3	.....	31.70	68.30	.....	1.66	.....	.....	.....	.....	.....	8,655	15,578
Same (car sample, screened coal, being unloaded)	.....	W46548	C	1	1.00	29.60	63.70	5.70	1.83	.....	.....	.....	.....	.....	8,071	14,528
		W46549		2	.....	29.90	64.45	5.75	1.85	.....	.....	.....	.....	.....	8,153	14,675
				3	.....	31.70	68.30	.....	1.96	.....	.....	.....	.....	.....	8,650	15,570
Same (car sample, screened coal, being unloaded)	.....	W46550	C	1	1.20	29.50	63.80	5.50	1.66	.....	.....	.....	.....	.....	8,091	14,563
		W46551		2	.....	29.90	64.65	5.55	1.68	.....	.....	.....	.....	.....	8,191	14,743
				3	.....	31.70	68.30	.....	1.78	.....	.....	.....	.....	.....	8,670	15,606
Mulga; sec. 18, T. 17 S., R. 4 N.; Mulga mine, Pratt bed (face of 7, left entry, north haulage road).	.....	19970	A	1	2.29	27.82	64.78	5.11	1.15	.....	.....	.....	.....	1.8	8,054	14,497
Same (face of 19 room, 8 right entry, north haulage road)	.....	19971	A	1	2.39	28.82	63.73	5.06	1.77	.....	.....	.....	.....	1.8	8,026	14,447
Same (face of 22 room, main east entry)	.....	19978	A	1	2.04	29.78	63.00	5.18	1.19	.....	.....	.....	.....	1.4	8,069	14,524
Same (face of 6 room, 5 right entry, 1 north entry, main east entry)	.....	19979	A	1	2.22	29.40	62.97	5.41	1.72	.....	.....	.....	.....	1.7	8,013	14,423
Same (face of 33 room, 4 left entry, north haulage way)	.....	19980	A	1	2.28	26.97	63.97	6.78	2.13	.....	.....	.....	.....	1.7	7,884	14,191
Same (composite of samples 19970, 19971, 19978, 19979, and 19980)	.....	19972	A	1	2.25	28.43	63.78	5.54	1.60	5.08	80.91	1.56	5.31	1.7	8,011	14,420
				2	.....	29.08	65.25	5.67	1.64	4.94	82.77	1.60	3.38	.....	8,195	14,751
				3	.....	30.83	69.17	.....	1.74	5.24	87.74	1.70	3.58	.....	8,688	15,638
Pinson, 3 miles northwest of; sec. 13, T. 15 S., R. 2 W.; Dixana No. 4 mine; Black Creek bed (face of 8 room, 12 left entry, 3,000 feet southwest of opening).	.....	22467	A	1	2.76	30.62	63.91	2.71	.81	.....	.....	.....	.....	1.6	8,116	14,609
Same (face of 15 right air course, 3,300 feet west of opening)	.....	22468	A	1	2.43	31.57	63.46	2.54	.84	.....	.....	.....	.....	1.3	8,158	14,684
Same (face of 13 right entry, 2,800 feet northwest of opening)	.....	22469	A	1	2.59	32.04	63.30	2.07	.92	.....	.....	.....	.....	1.4	8,170	14,706
Same (face of 8 left entry, 2,500 feet northwest of opening)	.....	22470	A	1	2.97	31.86	61.88	3.29	.65	.....	.....	.....	.....	1.8	8,036	14,465
Same (composite of samples 22467, 22468, 22469, and 22470)	.....	22471	A	1	2.57	31.84	62.87	2.72	.80	5.36	82.67	1.80	6.65	1.5	8,130	14,634
				2	.....	32.68	64.53	2.79	.82	5.20	84.85	1.85	4.49	.....	8,345	15,021
				3	.....	33.62	66.38	.....	.84	5.35	87.29	1.90	4.62	.....	8,585	15,453

Same (grab sample of nut coal from loading chute from washer bin)	22466	C	1	2.20	32.13	63.55	2.12	.66					1.0	8,224	14,803
			2		32.85	64.98	2.17	.67						8,409	15,136
			3		33.58	66.42		.68						8,596	15,473
Same (grab sample of pea coal from loading chute from washer bin)	22472	C	1	7.91	30.06	58.23	3.80	.61					6.7	7,593	13,667
Same (grab sample of pea coal from loading chute from washer bin)	22473	C	1	5.51	31.04	59.74	3.71	.64					4.3	7,798	14,036
Same (grab sample of pea coal from loading chute from washer (bin)	22474	C	1	7.80	29.92	58.43	3.85	.62					6.6	7,571	13,628
Same (grab sample of pea coal from loading chute from washer bin.)	22475	C	1	8.58	29.50	58.17	3.75	.66					7.4	7,536	13,565
Same (grab sample of pea coal from loading chute from washer bin)	22476	C	1	8.02	29.77	58.05	4.16	.65					6.7	7,532	13,558
Same (grab sample of pea coal from loading chute from washer bin)	22477	C	1	5.56	30.51	60.15	3.78	.68					4.2	7,775	13,995
Same (grab sample of pea coal from loading chute from washer bin)	22478	C	1	6.68	30.63	59.26	3.43	.63					5.5	7,724	13,903
Same (composite of samples 22472, 22473, 22474, 22475, 22476, 22477, and 22478)	22479	C	1	7.08	30.42	58.66	3.84	.64	5.52	77.65	1.72	10.63	5.9	7,644	13,759
			2		32.74	63.13	4.13	.69	5.09	83.57	1.85	4.67		8,226	14,807
			3		34.15	65.85		.72	5.31	87.17	1.93	4.87		8,581	15,446
Sayreton; Sayreton mine, Mary Lee bed (face of 57 room, 13 west entry)	20993	A	1	2.23	29.55	58.36	9.86	.68					1.4	7,531	13,556
Same (face of 58 room, 11 west entry)	20994	A	1	2.53	29.89	57.35	10.23	.81					1.6	7,454	13,417
Same (composite of samples 20993 and 20994)	20995	A	1	2.34	29.74	57.97	9.95	.75	5.17	76.65	1.58	5.90	1.5	7,495	13,491
			2		30.45	59.37	10.18	.77	5.03	78.49	1.62	3.91		7,675	13,815
			3		33.90	66.10		.86	5.60	87.38	1.80	4.36		8,545	15,381
Same (pillar of 80 room, 10 east entry)	20996	A	1	2.18	30.15	57.07	10.60	.76					1.2	7,457	13,423
			2		30.82	58.34	10.84	.78						7,623	13,721
			3		34.57	65.43		.87						8,550	15,390
Wylam; Pratt No. 5 mine, Pratt bed (pillar in 44 room, 30 west entry)	W46829	A	1	1.70	32.00	61.20	5.10	1.45						8,017	14,430
Same (face of 37 west air course)	W46830	A	1	1.90	30.40	62.70	5.00	1.45						8,044	14,480
Same (face of 33 west air course)	W46833	A	1	2.20	30.30	62.60	4.90	1.35						8,028	14,450
Same (pillar in 2 room, old 31 west entry)	W46834	A	1	1.90	31.90	61.80	4.40	1.30						8,067	14,520
Same (composite of samples W46829, W46830, W46833, and W46834)	19642	A	1	1.94	30.28	62.97	4.81	1.52	5.10	81.24	1.62	5.71		8,062	14,512
			2		30.88	64.21	4.91	1.55	4.98	82.85	1.65	4.06		8,221	14,798
			3		32.47	67.53		1.63	5.24	87.13	1.74	4.26		8,645	15,561
Same (car sample)	W46516	C	1	1.10	29.50	63.00	6.40	1.81						7,962	14,331
	W46517		2		29.85	63.75	6.50	1.83						8,050	14,490
			3		31.93	68.17		1.96						8,609	15,497
Pratt No. 8 mine, Pratt bed (face of 7 room, 13 west entry, main west slope)	W46821	A	1	1.90	33.10	59.10	5.90	1.80						7,883	14,190
Same (face of 6 room, 3 right entry, back slope)	W46822	A	1	2.00	35.10	58.30	4.60	1.10						7,956	14,320
Same (face of main west slope)	W46823	A	1	2.10	33.00	59.70	5.20	1.60						7,956	14,320
Same (pillar in 10 room, 29 west entry)	W46824	A	1	1.90	32.90	60.50	4.70	1.35						8,072	14,530
Same (pillar at face of 26 east entry)	W46825	A	1	1.60	34.40	59.60	4.40	1.20						8,072	14,530
Same (composite of samples W46821 to W46825)	19644	A	1	1.90	32.58	60.54	4.98	1.61	5.20	80.54	1.58	6.09		8,003	14,405
			2		33.21	61.71	5.08	1.64	5.09	82.10	1.61	4.48		8,158	14,684
			3		34.99	65.01		1.73	5.36	86.49	1.70	4.72		8,594	15,469
Same (car sample)	W46529	C	1	1.30	33.00	59.20	6.50	1.76						7,894	14,210
	W46530		2		33.40	60.00	6.60	1.78						7,994	14,390
			3		35.80	64.20		1.91						8,556	15,400

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
ALABAMA—Continued.																
ST. CLAIR COUNTY.																
Parsons, 1 mile west of; sec. 24, T. 16 S., R. 1 E.; Acmar mine, Harkness bed (face of 19 room, 6 left entry).	1 and 2	18853	A	1	2.46	33.29	53.14	11.11	0.88	.....	.....	.....	.....	1.1	7,303	13,145
Same (face of 14 room, 5 left entry)	.....	18854	A	1	2.59	33.92	51.73	11.76	.89	.....	.....	.....	.....	1.2	7,213	12,983
Same (composite of samples 18853 and 18854)	.....	18855	A	1	2.52	33.13	52.91	11.44	.87	5.01	72.79	1.67	8.22	1.1	7,259	13,066
				2	.....	33.99	54.27	11.74	.89	4.85	74.68	1.71	6.13	.....	7,447	13,405
				3	.....	38.50	61.50	.....	1.01	5.50	84.61	1.94	6.94	.....	8,437	15,187
Sanie, 3 miles west of; Margaret No. 1 mine, Harkness bed (face of 12 north entry).	.....	18549	A	1	1.90	32.95	52.81	12.34	2.10	.....	.....	.....	.....	.8	7,188	12,938
Same (face of 11 south entry)	.....	18550	A	1	2.14	31.68	53.58	12.60	1.88	.....	.....	.....	.....	1.0	7,153	12,875
Same (face of 8 south entry)	.....	18551	A	1	2.61	31.74	53.58	12.07	1.92	.....	.....	.....	.....	1.4	7,150	12,870
Same (composite of samples 18549, 18550, and 18551)	.....	18552	A	1	2.20	31.84	53.59	12.37	1.92	4.88	72.09	1.70	7.04	1.1	7,145	12,861
				2	.....	32.55	54.80	12.65	1.96	4.73	73.71	1.74	5.21	.....	7,306	13,151
				3	.....	37.26	62.74	.....	2.24	5.41	84.38	1.99	5.98	.....	8,364	15,055
Sanie, 3 miles west of: Margaret No. 2 mine, Harkness bed (face of 11 room, 10 south entry).	.....	24374	A	1	2.38	32.23	55.31	10.08	1.38	.....	.....	.....	.....	1.1	7,368	13,262
Same (face of 11 north entry)	.....	24375	A	1	2.36	32.70	55.10	9.84	1.89	.....	.....	.....	.....	1.1	7,393	13,307
Same (face of 9 room, 10 north entry)	.....	24376	A	1	2.20	33.66	54.19	9.95	2.02	.....	.....	.....	.....	1.0	7,412	13,342
Same (composite of samples 24374, 24375, and 24376)	.....	24377	A	1	2.28	33.07	54.63	10.02	1.76	5.06	73.98	1.65	7.53	1.1	7,407	13,333
				2	.....	33.84	55.91	10.25	1.80	4.92	75.70	1.69	5.64	.....	7,580	13,644
				3	.....	37.70	62.30	.....	2.01	5.48	84.34	1.88	6.29	.....	8,446	15,203
SHELBY COUNTY.																
Helena, 6 miles northeast of; Acton No. 2 mine, Helena bed (face of 5 right entry).	.....	18288	A	1	2.39	35.51	54.31	7.79	.42	.....	.....	.....	.....	.8	7,517	13,531
Same (face of 16 room, 8 right entry)	.....	18289	A	1	2.44	34.93	54.46	8.17	.50	.....	.....	.....	.....	.9	7,527	13,549
Same (face of 8 left entry)	.....	18290	A	1	1.95	36.10	55.03	6.92	.63	.....	.....	.....	.....	.5	7,627	13,729
Same (composite of samples 18288, 18289, and 18290)	.....	18291	A	1	2.19	35.57	54.63	7.61	.55	5.19	76.82	1.47	8.36	.7	7,566	13,619
				2	.....	36.37	55.85	7.78	.56	5.06	78.54	1.50	6.56	.....	7,735	13,923
				3	.....	39.44	60.56	.....	.61	5.49	85.17	1.63	7.10	.....	8,838	15,098

TUSCALOOSA COUNTY.															
Rock Castle; sec. 24, T. 20 S., R. 7 W.; Rock Castle mine, Jagger bed (face of 17 room, 18 right entry).	.....	18510	A	1	2.87	25.63	62.86	8.64	.60	.....	.....	.....	.....	2.4	7,657	13,783
Same (face of 26 room, 17 right entry)	.....	18511	A	1	2.60	25.95	63.71	7.74	.62	.....	.....	.....	.....	2.1	7,767	13,981
Same (face of 1 room, 19 left entry)	.....	18512	A	1	2.57	26.37	61.45	9.61	.69	.....	.....	.....	.....	2.0	7,612	13,702
Same (composite of samples 18510, 18511, and 18512)	.....	18513	A	1	2.70	25.77	62.87	8.66	.69	4.87	78.59	1.58	5.61	2.1	7,691	13,844
				2	.....	26.48	64.62	8.90	.71	4.70	80.77	1.62	3.30	.....	7,904	14,227
				3	.....	29.07	70.93	.....	.78	5.16	88.66	1.78	3.62	.....	8,676	15,617
WALKER COUNTY.															
Carbon Hill, 1 mile southwest of; sec. 36, T. 13 S., R. 10 W.; Galloway No. 11 mine, Jagger bed (face of 1 room, 2 left face heading, 3 left entry).	.....	24954	A	1	4.42	33.48	52.53	9.57	.63	.....	.....	.....	.....	1.8	7,022	12,640
Same (face of 7 right entry)	.....	24955	A	1	4.29	34.22	52.10	9.39	.66	.....	.....	.....	.....	1.7	7,027	12,649
Same (face of 2 room, 1 right face heading, 3 right entry)	.....	24956	A	1	4.27	32.10	49.74	13.89	.66	.....	.....	.....	.....	1.8	6,658	11,984
Same; face of slope	.....	24957	A	1	4.33	33.49	52.21	9.97	.69	.....	.....	.....	.....	1.8	6,991	12,584
Same (composite of samples 24954, 24955, 24956, and 24957)	.....	24958	A	1	4.36	33.17	51.73	10.74	.68	5.11	69.57	1.63	12.27	1.8	6,934	12,481
				2	.....	34.68	54.09	11.23	.71	4.84	72.74	1.70	8.78	.....	7,250	13,050
				3	.....	39.07	60.93	.....	.80	5.45	81.94	1.92	9.89	.....	8,167	14,701
Dora, 9 miles northeast of; Sipsey mine, Black Creek bed (face of 6 west entry).	.....	18404	A	1	3.75	34.58	57.80	3.87	1.22	.....	.....	.....	.....	2.0	.....	.....
Same (face of 12 room, 10 west entry)	.....	18405	A	1	3.36	35.54	58.64	2.46	.93	.....	.....	.....	.....	1.5	.....	.....
Same (face of 13 room, 9 east entry)	.....	18406	A	1	3.75	34.05	59.55	2.65	.83	.....	.....	.....	.....	1.8	.....	.....
Same (face of 9 room, 5 east entry)	.....	18407	A	1	3.59	33.94	58.93	3.54	1.11	.....	.....	.....	.....	1.8	.....	.....
Same (composite of samples 18404, 18405, 18406, and 18407)	.....	18408	A	1	3.61	34.77	58.58	3.04	1.06	5.35	79.13	1.73	9.69	1.8	7,819	14,074
				2	.....	36.07	60.78	3.15	1.10	5.14	82.10	1.79	6.72	.....	8,112	14,602
				3	.....	37.24	62.76	.....	1.14	5.31	84.77	1.85	6.93	.....	8,376	15,077
ALASKA.															
BERING RIVER.															
Wardall Ridge, west side of; SE. ¼ of sec. 10, T. 17 S., R. 8 E.; outcrop	.....	22932	A	1	5.33	17.53	70.26	6.88	.64	.....	.....	.....	.....	.8	6,868	12,362
				2	.....	18.52	74.21	7.27	.68	.....	.....	.....	.....	.....	7,255	13,058
				3	.....	19.97	80.03	.....	.73	.....	.....	.....	.....	.....	7,824	14,082
Same (outcrop of bed about 30 feet below bed from which sample 22932 was taken).	.....	22933	A	1	3.12	15.62	80.03	1.23	.68	.....	.....	.....	.....	.5	7,900	14,220
				2	.....	16.12	82.61	1.27	.70	.....	.....	.....	.....	.....	8,154	14,677
				3	.....	16.33	83.67	.....	.71	.....	.....	.....	.....	.....	8,259	14,866
FAIRHAVEN DISTRICT.															
Candle, 20 miles from; Kugruk mine (face of stope, 450 feet from adit, 180 feet vertically below surface).	.....	*19928	A	1	19.74	36.25	38.84	5.17	1.21	6.26	54.82	1.03	31.51	8.5	5,324	9,583
				2	.....	45.17	48.39	6.44	1.51	5.07	68.31	1.28	17.39	.....	6,634	11,941
				3	.....	48.28	51.72	.....	1.61	5.42	73.01	1.37	18.59	.....	7,090	12,762
IDITAROD DISTRICT.															
Iditarod-Flat tramway	.....	19347	B	1	1.42	6.60	84.73	7.25	1.10	.....	.....	.....	.....	.0	.....	.....
				2	.....	6.70	85.95	7.35	1.12	.....	.....	.....	.....	.....	.....	.....
				3	.....	7.23	92.77	.....	1.21	.....	.....	.....	.....	.....	.....	.....

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
ALASKA—Continued.																
MATANUSKA FIELD.																
Anthracite Ridge, about 500 feet from eastern edge of field (outcrop at elevation of about 5,800 feet and overlooking Matanuska Glacier).	.....	17792	B	1	4.73	34.87	52.76	7.64	0.48	5.51	71.81	1.30	13.26	0.7	7,082	12,748
				2	.....	36.60	55.38	8.02	.50	5.23	75.37	1.36	9.52	.....	7,433	13,379
				3	.....	39.79	60.21	.....	.54	5.69	81.94	1.48	10.35	.....	8,081	14,546
Boulder Creek, 16½ miles above its mouth; pieces from outcrop	.....	19346	B	1	5.27	35.50	50.57	8.66	.43	.....	.....	.....	.....	.7	.....	.....
				2	.....	37.47	53.39	9.14	.45	.....	.....	.....	.....	.....	.....	.....
				3	.....	41.24	58.76	.....	.50	.....	.....	.....	.....	.....	.....	.....
Chickaloon River, outcrop on east bank, 1 mile above ford	.....	18036	A	1	1.78	22.47	68.22	7.53	.57	.....	.....	.....	.....	.....	.....	.....
				2	.....	22.88	69.45	7.67	.58	.....	.....	.....	.....	.....	.....	.....
				3	.....	24.78	75.22	.....	.63	.....	.....	.....	.....	.....	.....	.....
U. S. N. A. C. I. E. Tunnel B, lower No. 5 bed, crosscut connecting Tunnels 2 and B.	.....	18148	A	1	1.96	19.18	69.50	9.36	.57	4.63	79.38	1.56	4.50	1.2	7,707	13,873
				2	.....	19.56	70.89	9.55	.58	4.50	80.97	1.59	2.81	.....	7,861	14,150
				3	.....	21.63	78.37	.....	.64	4.98	89.52	1.76	3.10	.....	8,691	15,644
Same (No. 5½ bed)	.....	18141	A	1	2.37	20.17	69.51	7.95	.61	4.66	79.94	1.42	5.42	1.6	7,761	13,970
				2	.....	20.66	71.20	8.14	.62	4.51	81.88	1.45	3.40	.....	7,950	14,310
				3	.....	22.49	77.51	.....	.67	4.91	89.13	1.58	3.71	.....	8,654	15,577
Same (upper 2 feet of 3-foot section of No. 6 bed)	.....	18143	A	1	1.89	20.47	74.63	3.01	.68	4.78	85.55	1.50	4.48	1.4	8,280	14,904
				2	.....	20.87	76.06	3.07	.69	4.66	87.20	1.53	2.85	.....	8,440	15,192
				3	.....	21.53	78.47	.....	.71	4.81	89.96	1.58	2.94	.....	8,708	15,674
Same (sample of coal through ¾-inch screen from No. 8 bed)	.....	18317	A	1	1.44	21.00	70.34	7.22	.51	.....	.....	.....	.....	.8	7,946	14,303
				2	.....	21.31	71.36	7.33	.52	.....	.....	.....	.....	.....	8,062	14,512
				3	.....	23.00	77.00	.....	.56	.....	.....	.....	.....	.....	8,700	15,660
Same (No. 9 bed, face of tunnel)	.....	18150	A	1	2.64	18.01	59.35	20.00	.54	4.25	68.13	1.40	5.68	1.9	6,579	11,842
				2	.....	18.50	60.96	20.54	.55	4.07	69.98	1.44	3.42	.....	6,757	12,163
				3	.....	23.28	76.72	.....	.69	5.12	88.07	1.81	4.31	.....	8,504	15,307
Same (screenings for a 3-day run, from "Big Vein")	.....	18039	A	1	1.28	20.85	70.29	7.58	.49	.....	.....	.....	.....	.6	7,901	14,222
				2	.....	21.12	71.20	7.68	.50	.....	.....	.....	.....	.....	8,004	14,407
				3	.....	22.88	77.12	.....	.54	.....	.....	.....	.....	.....	8,670	15,606
Same (fines from "Big Vein")	.....	18042	A	1	2.21	20.75	68.93	8.11	.43	.....	.....	.....	.....	1.6	7,779	14,002
				2	.....	21.22	70.49	8.29	.44	.....	.....	.....	.....	.....	7,955	14,319
				3	.....	23.14	76.86	.....	.48	.....	.....	.....	.....	.....	8,674	15,613

Same (slack from "Big Vein")		18043	A	1	1.25	21.50	70.09	7.16	.45					.7	7,957	14,323
				2		21.77	70.98	7.25	.46						8,058	14,504
				3		23.47	76.53		.50						8,688	15,638
Same (150 pounds of screenings from "Big Vein," crushed and split; sample taken with a scoop, below the hopper, at every third sack).		18149	A	1	2.18	20.38	68.40	9.04	.46					1.6	7,692	13,846
				2		20.83	69.93	9.24	.47						7,864	14,155
				3		22.95	77.05		.52						8,665	15,597
Same (sample of fines from bunker at Tunnel B)		18037	A	1	.84	21.39	70.47	7.30	.49							
				2		21.57	71.07	7.36	.49							
				3		23.28	76.72		.53							
Same (sample of fines from bunker at Tunnel B)		18044	A	1	1.70	20.86	69.30	8.14	.46					1.1	7,851	14,132
				2		21.22	70.50	8.28	.47						7,987	14,377
				3		23.14	76.86		.51						8,708	15,674
Same (sample of fines from bunker at Tunnel B)		18045	A	1	2.03	21.19	68.78	8.00	.43					1.4	7,816	14,069
				2		21.63	70.20	8.17	.44						7,978	14,360
				3		23.56	76.44		.48						8,688	15,638
Same (slack from bunker at Tunnel B)		18145	A	1	1.85	20.35	69.48	8.32	.46					1.3	7,782	14,008
				2		20.73	70.79	8.48	.47						7,928	14,270
				3		22.65	77.35		.51						8,663	15,593
Same		18152	A	1	1.93	20.07	69.86	8.14	.46					1.3	7,788	14,018
				2		20.47	71.23	8.30	.47						7,941	14,294
				3		22.32	77.68		.51						8,660	15,588
Same		18154	A	1	1.72	20.73	68.77	8.78	.45					1.2	7,750	13,950
				2		21.09	69.98	8.93	.46						7,886	14,195
				3		23.16	76.84		.51						8,660	15,588
Same		18146	A	1	1.78	20.23	67.09	10.90	.47					1.2	7,528	13,550
				2		20.60	68.30	11.10	.48						7,664	13,795
				3		23.17	76.83		.54						8,621	15,518
Same		18105	A	1	1.38	20.29	67.42	10.91	.45					.8	7,584	13,651
				2		20.57	68.37	11.06	.46						7,690	13,842
				3		23.13	76.87		.52						8,647	15,565
Same		18099	A	1	1.61	20.42	67.68	10.29	.48					1.0	7,619	13,714
				2		20.75	68.79	10.46	.49						7,744	13,939
				3		23.17	76.83		.55						8,648	15,566
Same		18106	A	1	1.33	20.73	67.57	10.37	.46					.8	7,634	13,741
				2		21.01	68.48	10.51	.47						7,737	13,927
				3		23.48	76.52		.53						8,645	15,561
Same		18098	A	1	1.33	21.34	68.07	9.26	.47					.8	7,743	13,937
				2		21.63	68.98	9.39	.48						7,848	14,126
				3		23.87	76.13		.53						8,661	15,590
U. S. N. A. C. I. E. Tunnel C; C bed (at face)		18038	A	1	2.28	19.19	63.95	14.58	.81							
				2		19.64	65.44	14.92	.83							
				3		23.08	76.92		.98							
U. S. N. A. C. I. E. Tunnel D; E bed (near face)		18046	A	1	2.60	21.48	65.08	10.84	1.47	4.55	76.11	1.62	5.41	1.7	7,420	13,356
				2		22.05	66.82	11.13	1.51	4.37	78.14	1.66	3.19		7,618	13,712
				3		24.81	75.19		1.70	4.92	87.92	1.87	3.59		8,572	15,430
Same, D bed (face of 1 left crosscut, 120 feet from mouth of tunnel)		17793	A	1	1.77	19.88	66.34	12.01	.53	4.61	76.59	1.70	4.56	.6	7,447	13,405
				2		20.24	67.53	12.23	.54	4.49	77.97	1.73	3.04		7,581	13,646
				3		23.06	76.94		.62	5.12	88.83	1.97	3.46		8,637	15,547
U. S. N. A. C. I. E. Tunnel E; B bed		17916	A	1	1.88	16.85	54.52	26.75	.58							
				2		17.17	55.57	27.26	.59							
				3		23.60	76.40		.81							

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
ALASKA—Continued.																
MATANUSKA FIELD—continued.																
Chickaloon River—Continued.																
U. S. N. A. C. I. E. Tunnel I; No. 8 bed (at face, 10 feet from mouth)		18093	A	1	2.45	20.80	65.69	11.06	0.63	4.53	76.71	1.37	5.70	1.5	7,384	13,291
				2	.....	21.32	67.34	11.34	.65	4.37	78.64	1.40	3.60	.....	7,569	13,624
				3	.....	24.05	75.95	.....	.73	4.93	88.70	1.58	4.06	.....	8,537	15,367
Same (best part of section)		18101	A	1	1.91	21.15	68.07	8.87	.62	4.61	79.06	1.48	5.36	1.2	7,695	13,851
				2	.....	21.56	69.40	9.04	.63	4.49	80.60	1.51	3.73	.....	7,845	14,121
				3	.....	23.70	76.30	.....	.69	4.94	88.61	1.66	4.10	.....	8,625	15,525
U. S. N. A. C. I. E. Tunnel 2; upper No. 5 bed (face of crosscut, driven west).		18153	A	1	2.08	19.62	70.57	7.73	.56	4.67	80.48	1.51	5.05	1.3	7,803	14,045
				2	.....	20.04	72.07	7.89	.57	4.53	82.19	1.54	3.28	.....	7,968	14,342
				3	.....	21.76	78.24	.....	.62	4.92	89.23	1.67	3.56	.....	8,651	15,572
U. S. N. A. C. I. E. Tunnel 3; No. 3 bed (1 left gangway, 52 feet from mouth).		18095	A	1	2.72	20.07	71.59	5.62	.67	4.74	81.19	1.72	6.06	1.8	7,929	14,272
				2	.....	20.63	73.59	5.78	.69	4.56	83.46	1.77	3.74	.....	8,151	14,672
				3	.....	21.89	78.11	.....	.73	4.84	88.58	1.88	3.97	.....	8,651	15,572
Same (No. 4 bed, face, 75 feet from opening)		18138	A	1	2.54	19.39	68.82	9.25	.63	4.63	78.51	1.50	5.48	1.9	7,619	13,714
				2	.....	19.90	70.61	9.49	.65	4.46	80.56	1.54	3.30	.....	7,818	14,072
				3	.....	21.99	78.01	.....	.72	4.93	89.01	1.70	3.64	.....	8,638	15,548
U. S. N. A. C. I. E. Tunnel 4; C bed (40 feet from mouth of tunnel)		17915	A	1	1.63	19.30	63.34	15.73	.54	.....	.....	.....	.....	.....	.....	.....
				2	.....	19.62	64.39	15.99	.55	.....	.....	.....	.....	.....	.....	.....
				3	.....	23.35	76.65	.....	.65	.....	.....	.....	.....	.....	.....	.....
Same (lower 2¼ feet of section represented by sample 18100)		18097	A	1	4.51	19.96	61.57	13.96	.44	4.49	72.03	1.70	7.38	3.6	6,974	12,553
				2	.....	20.90	64.48	14.62	.46	4.18	75.43	1.78	3.53	.....	7,303	13,145
				3	.....	24.48	75.52	.....	.54	4.90	88.34	2.08	4.14	.....	8,553	15,395
Same, D bed (face of 1 left crosscut, 150 feet from tunnel mouth)		18100	A	1	4.37	19.54	65.54	10.55	.49	4.68	75.46	1.75	7.07	3.5	7,328	13,190
				2	.....	20.43	68.54	11.03	.51	4.38	78.91	1.83	3.34	.....	7,663	13,793
				3	.....	22.96	77.04	.....	.57	4.92	88.69	2.06	3.76	.....	8,613	15,503
Same (crosscut to left of Tunnel 4 and counter to Tunnel D)		18142	A	1	2.52	19.54	63.61	14.33	.50	.....	.....	.....	.....	1.7	7,146	12,863
				2	.....	20.05	65.25	14.70	.51	.....	.....	.....	.....	.....	7,331	13,196
				3	.....	23.50	76.50	.....	.60	.....	.....	.....	.....	.....	8,594	15,469

Same, D bed (slack coal through ¾-inch screen from D bed)		18318	A	1	1.95	20.29	66.88	10.88	.55					1.1	7,526	13,547
				2		20.69	68.21	11.10	.56						7,676	13,817
				3		23.27	76.73		.63						8,635	15,543
Coal Creek; U. S. N. A. C. I. E. Tunnel A, on west side of Coal Creek opposite cabin (No. 2 bed, rib of gangway, 124 feet from mouth of tunnel).		17907	A	1	2.74	26.56	58.68	12.02	.34							
				2		27.31	60.33	12.36	.35							
				3		31.16	68.84		.40							
Same (No. 7 bed, rib along tunnel)		18140	A	1	2.72	16.91	61.00	19.37	.59	4.16	68.86	1.32	5.70	1.8	6,692	12,046
				2		17.38	62.71	19.91	.61	3.97	70.79	1.36	3.36		6,879	12,382
				3		21.70	78.30		.76	4.96	88.39	1.70	4.19		8,589	15,460
Same (No. 8 bed, face of 1 gangway, 50 feet from its mouth)		18104	A	1	1.71	21.12	72.08	5.09	.46	4.82	83.41	1.42	4.80	1.1	8,130	14,634
				2		21.49	73.33	5.18	.47	4.71	84.86	1.44	3.34		8,271	14,888
				3		22.66	77.34		.50	4.97	89.49	1.52	3.52		8,723	15,701
Same (No. 8 bed, along rib of tunnel)		18108	A	1	1.84	20.78	70.07	7.31	.45	4.66	80.94	1.46	5.18	1.2	7,910	14,238
				2		21.17	71.38	7.45	.46	4.54	82.45	1.49	3.61		8,058	14,504
				3		22.87	77.13		.50	4.91	89.09	1.61	3.89		8,707	15,673
Same (No. 8 bed; along rib of tunnel from the best-appearing part of No. 8 bed).		18139	A	1	1.89	21.20	72.77	4.14	.46	4.85	84.30	1.44	4.81	1.4	8,180	14,724
				2		21.61	74.17	4.22	.47	4.73	85.93	1.47	3.18		8,338	15,008
				3		22.56	77.44		.49	4.94	89.72	1.53	3.32		8,706	15,671
Outcrop; C bed (1½ miles above mouth of Coal Creek on east bank)		18321	A	1	3.58	37.88	55.19	3.35	.32					1.6	7,670	13,806
				2		39.29	57.24	3.47	.33						7,955	14,319
				3		40.70	59.30		.34						8,241	14,834
Outcrop; No. 3 bed (station 9–B of Geological Survey)		18041	A	1	2.84	36.19	55.21	5.76	.39	5.53	75.97	1.87	10.48	.6	7,544	13,579
				2		37.25	56.82	5.93	.40	5.36	78.19	1.92	8.20		7,764	13,975
				3		39.60	60.40		.43	5.70	83.12	2.04	8.71		8,253	14,855
Same (upper part of section represented by sample 18041)		18047	A	1	2.75	39.36	55.08	2.81	.33	5.82	78.95	2.07	10.02	.6	7,873	14,171
				2		40.47	56.64	2.89	.34	5.67	81.18	2.13	7.79		8,096	14,573
				3		41.68	58.32		.35	5.84	83.60	2.19	8.02		8,337	15,007
Same (exposed outcrop)		18103	A	1	3.45	20.97	65.63	9.95	.35	4.69	75.66	1.79	7.56	1.8	7,316	13,169
				2		21.72	67.97	10.31	.36	4.46	78.36	1.85	4.66		7,577	13,639
				3		24.22	75.78		.40	4.97	87.37	2.06	5.20		8,448	15,206
Outcrop; No. 2 bed (½ mile below cabin, at station 19–B of Geological Survey).		18040	A	1	2.53	20.94	67.01	9.52	.42	4.69	77.68	1.78	5.91	1.3	7,532	13,558
				2		21.48	68.75	9.77	.43	4.51	79.70	1.83	3.76		7,728	13,910
				3		23.81	76.19		.48	5.00	88.33	2.03	4.16		8,565	15,417
Same		18094	A	1	4.96	21.79	68.83	4.42	.39	4.84	78.67	1.69	9.99	2.8	7,644	13,759
				2		22.93	72.42	4.65	.41	4.51	82.78	1.78	5.87		8,043	14,477
				3		24.05	75.95		.43	4.73	86.82	1.87	6.15		8,435	15,183
Outcrop; No. 6 bed (bottom of 4-foot 7-inch section, ⅞ mile above mouth of Coal Creek).		18092	A	1	4.78	19.20	64.65	11.37	.43	4.54	72.59	1.71	9.36	2.7	6,960	12,528
				2		20.16	67.90	11.94	.45	4.21	76.23	1.80	5.37		7,309	13,156
				3		22.89	77.11		.51	4.78	86.57	2.04	6.10		8,300	14,940
Same (10-foot cut from 13-foot 11-inch bed)		18109	A	1	6.32	17.19	67.45	9.04	.43	4.44	73.67	1.74	10.68	3.7	7,021	12,638
				2		18.35	72.00	9.65	.46	3.99	78.64	1.86	5.40		7,495	13,491
				3		20.31	79.69		.51	4.42	87.04	2.06	5.97		8,295	14,931
Outcrop; No. 5 bed (50 feet upstream, from sample 18320, which was taken ¾ mile above mouth of Coal Creek, on east bank).		18322	A	1	2.82	21.43	66.15	9.60	.39					1.8	7,511	13,520
				2		22.05	68.07	9.88	.40						7,729	13,912
				3		24.47	75.53		.44						8,576	15,437
Outcrop; No. 1 bed (about ½ mile below Coal Creek cabin, 40 feet downstream, from outcrop of No. 2 bed).		17906	A	1	2.25	21.96	69.48	6.31	.54							
				2		22.47	71.07	6.46	.55							
				3		24.02	75.98		.59							
Outcrop; No. 4 bed (¾ mile above mouth of Coal Creek, on east bank).		18320	A	1	3.51	21.45	68.46	6.58	.50					2.5	7,613	13,703
				2		22.23	70.95	6.82	.52						7,890	14,202
				3		23.86	76.14		.56						8,468	15,242

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
ALASKA—Continued.																
MATANUSKA FIELD—continued.																
Coal Creek, U. S. N. A. C. I. E. prospect drift 1, No. 1 bed (at face 16½ feet from mouth).	.....	18107	A	1	3.95	20.16	67.04	8.85	0.50	4.58	76.44	1.68	7.95	2.6	7,463	13,433
				2	.....	20.99	69.80	9.21	.52	4.31	79.58	1.75	4.63	.....	7,770	13,986
				3	.....	23.12	76.88	.....	.57	4.75	87.65	1.93	5.10	.....	8,558	15,404
U. S. N. A. C. I. E. prospect drift 2, No. 4 bed (at face, 43 feet from mouth).	.....	18096	A	1	2.35	20.34	64.19	13.12	.61	4.56	74.47	1.68	5.56	1.6	7,326	13,187
				2	.....	20.83	65.73	13.44	.62	4.40	76.26	1.72	3.56	.....	7,503	13,505
				3	.....	24.06	75.94	.....	.72	5.08	88.10	1.99	4.11	.....	8,668	15,602
Same (at face, 43 feet from mouth of drift; 2-foot 4-inch cut of clean, bright coal at bottom of bed).	.....	18102	A	1	2.03	21.60	69.68	6.69	.57	4.84	81.03	1.88	4.99	1.4	7,958	14,324
				2	.....	22.05	71.12	6.83	.58	4.71	82.71	1.92	3.25	.....	8,123	14,621
				3	.....	23.67	76.33	.....	.62	5.06	88.77	2.06	3.49	.....	8,718	15,692
Kings River outcrop, No. 1 bed (below lower bridge on west bank of river).	.....	18137	A	1	2.37	23.60	63.12	10.91	.50	4.74	76.75	1.12	5.98	1.6	7,454	13,417
				2	.....	24.17	64.65	11.18	.51	4.59	78.62	1.15	3.95	.....	7,635	13,743
				3	.....	27.21	72.79	.....	.57	5.17	88.52	1.29	4.45	.....	8,596	15,473
Same (on west bank, 600 feet below cabin)	.....	18139	A	1	1.78	23.19	66.46	8.57	.57	.....	.....	.....	.....	.9	7,748	13,946
				2	.....	23.61	67.66	8.73	.58	.....	.....	.....	.....	.....	7,888	14,198
				3	.....	25.87	74.13	.....	.64	.....	.....	.....	.....	.....	8,642	15,556
Same (on east bank above Rock Tunnel at point where igneous sill divides bed into two parts; sample taken from upper part).	.....	18136	A	1	6.55	5.28	76.25	11.92	.19	2.21	75.89	.84	8.95	4.8	6,493	11,687
				2	.....	5.65	81.59	12.76	.20	1.58	81.21	.90	3.35	.....	6,948	12,506
				3	.....	6.48	93.52	.....	.23	1.81	93.09	1.03	3.84	.....	7,964	14,335
Same (selected pieces of natural coke from outcrop, 15 feet to the right of where sample 18136 was taken).	.....	18147	A	1	1.80	3.78	82.11	12.31	.11	1.23	82.33	.68	3.34	1.0	6,808	12,254
				2	.....	3.85	83.61	12.54	.11	1.05	83.84	.69	1.77	.....	6,933	12,479
				3	.....	4.40	95.60	.....	.13	1.20	95.86	.79	2.02	.....	7,927	14,269
Outcrop; No. 2 bed (outcrop of bed about 13 feet above outcrop of No. 1 bed).	.....	18151	A	1	2.89	22.56	58.56	15.99	.52	4.54	71.14	1.14	6.67	1.8	6,923	12,461
				2	.....	23.23	60.30	16.47	.54	4.35	73.26	1.17	4.21	.....	7,129	12,832
				3	.....	27.81	72.19	.....	.65	5.21	87.71	1.40	5.03	.....	8,535	15,363
Matanuska River, outcrop on south bank, 3 miles above mouth of Chickaloon River.	.....	18144	A	1	10.29	24.75	46.37	18.59	.28	4.68	56.67	1.61	18.17	6.0	5,374	9,673
				2	.....	27.59	51.69	20.72	.31	3.95	63.17	1.79	10.06	.....	5,990	10,782
				3	.....	34.80	65.20	.....	.39	4.98	79.68	2.26	12.69	.....	7,556	13,601
Port Graham; outcrop	.....	*17489	B	1	20.40	32.68	34.34	12.58	.84	.....	.....	.....	.....	3.5	4,757	8,563
				2	.....	41.06	43.14	15.80	1.06	.....	.....	.....	.....	.....	5,976	10,757
				3	.....	48.76	51.24	.....	1.26	.....	.....	.....	.....	.....	7,097	12,775

NENANA FIELD.																
Igloo Creek, about ¼ mile above its junction with Healy Creek, which is about 6 miles above the junction of Healy Creek with the Nenana River; outcrop (surface exposed).	.....	*17794	A	1	25.73	36.39	34.52	3.36	.15	6.87	51.41	.71	37.50	12.7	4,853	8,735
				2	.....	49.00	46.48	4.52	.20	5.40	69.22	.96	19.70	.....	6,534	11,761
				3	.....	51.32	48.68	.....	.21	5.66	72.49	1.01	20.63	.....	6,843	12,317
Same (400 to 500 feet below the point where sample 17794 was taken; surface exposed).	.....	*17795	A	1	28.52	34.29	33.59	3.60	.06	6.68	48.05	.68	40.93	14.2	4,494	8,089
				2	.....	47.97	46.99	5.04	.08	4.92	67.22	.95	21.79	.....	6,287	11,317
				3	.....	50.52	49.48	.....	.08	5.18	70.79	1.00	22.95	.....	6,621	11,918
Healy Creek; left bank nearly ¼ mile above its junction with Igloo Creek; outcrop (8-foot bed of exposed lignite).	.....	*17796	A	1	27.41	34.67	33.49	4.43	.16	6.71	48.51	.68	39.51	12.3	4,604	8,287
				2	.....	47.76	46.14	6.10	.22	5.04	66.83	.94	20.87	.....	6,342	11,416
					.....	50.86	49.14	.....	.23	5.37	71.17	1.00	22.23	.....	6,754	12,157
Nenana River; 1½ miles below Lignite Creek; exposure on west bank of Nenana River.	.....	*23042	B	1	28.16	34.52	33.68	3.64	.15	.....	.....	.....	.....	19.2	4,487	8,077
				2	.....	48.05	46.88	5.07	.21	.....	.....	.....	.....	.....	6,246	11,243
				3	.....	50.62	49.38	.....	.22	.....	.....	.....	.....	.....	6,580	11,844
Tatlanika River, right bank; about 6 miles below mouth of Grubstake Creek (2-foot cut of shaly material from near top of a bed of exposed lignite).	.....	*17797	A	1	19.70	37.45	24.74	18.11	.26	5.68	42.75	.59	32.61	7.1	4,048	7,286
				2	.....	46.64	30.81	22.55	.32	4.35	53.24	.73	18.81	.....	5,041	9,074
				3	.....	60.22	39.78	.....	.41	5.62	68.74	.94	24.29	.....	6,509	11,716
YAKATAGA FIELD.																
Duktoth Valley; on slope, 200 feet above valley floor and about 25 miles from mouth of Duktoth River; outcrop.	.....	19345	B	1	.99	11.46	64.09	23.46	.66	.....	.....	.....	.....	0.1	.....	.....
				2	.....	11.57	64.74	23.69	.67	.....	.....	.....	.....	.....	.....	.....
				3	.....	15.16	84.84	.....	.88	.....	.....	.....	.....	.....	.....	.....
ARKANSAS.																
FRANKLIN COUNTY.																
Denning, ½ mile east of depot; Denning No. 2 mine, Denning bed (face of 1 dip entry, 14 north, straight plane, 7,200 feet from shaft).	.....	18746	A	1	3.24	15.19	74.01	7.56	2.27	.....	.....	.....	.....	2.6	7,642	13,756
Same (face of 2 dip entry, 14 north, straight plane, 7,250 feet from shaft).	.....	18747	A	1	3.41	15.32	73.84	7.43	2.25	.....	.....	.....	.....	2.7	7,652	13,774
Same (face of 15 north, straight plane, 8,000 feet from shaft).	.....	18748	A	1	4.33	15.16	74.16	6.35	2.54	.....	.....	.....	.....	3.8	7,639	13,750
Same (composite of samples 18746, 18747, and 18748)	.....	18749	A	1	3.64	15.32	73.88	7.16	2.43	4.18	79.81	1.75	4.67	3.0	7,635	13,743
				2	.....	15.90	76.67	7.43	2.52	3.92	82.83	1.82	1.48	.....	7,924	14,263
				3	.....	17.18	82.82	.....	2.72	4.23	89.48	1.97	1.60	.....	8,560	15,408
LOGAN COUNTY.																
Paris, 1 mile northeast of; Grand No. 1 mine, Paris bed (face of 3 east, main slope, 1,500 feet from shaft bottom).	.....	18750	A	1	2.48	17.11	70.58	9.83	3.29	.....	.....	.....	.....	1.8	7,498	13,496
Same (face of 4 east, main slope, 1,900 feet from shaft bottom)	.....	18751	A	1	2.38	17.25	70.47	9.90	3.14	.....	.....	.....	.....	1.8	7,540	13,572
Same (face of 18 room, 3 west, main slope, 1,700 feet southwest of shaft bottom).	.....	18752	A	1	2.48	17.12	70.51	9.89	3.17	.....	.....	.....	.....	1.9	7,536	13,565
Same (composite of samples 18750, 18751, and 18752)	.....	18753	A	1	2.41	17.23	70.35	10.01	3.21	4.17	77.97	1.52	3.12	1.8	7,513	13,523
				2	.....	17.66	72.08	10.26	3.29	4.00	79.90	1.56	.99	.....	7,699	13,858
				3	.....	19.68	80.32	.....	3.67	4.46	89.03	1.74	1.10	.....	8,579	15,442
POPE COUNTY.																
Russelville, 2½ miles southwest of; Bernice mine, Shinn Basin bed (face of 10 room, 3 west entry, main west slope).	.....	18755	A	1	2.79	11.90	75.24	10.07	2.17	3.69	78.28	1.66	4.13	2.2	7,420	13,356
				2	.....	12.24	77.40	10.36	2.23	3.48	80.53	1.71	1.69	.....	7,633	13,739
				3	.....	13.65	86.35	.....	2.49	3.88	89.84	1.91	1.88	.....	8,515	15,327
Same (8 inches of dirty coal only included in sample)	.....	18757	A	1	3.55	10.36	53.65	32.44	.....	.....	.....	.....	.....	2.2	.....	.....
				2	.....	10.74	55.63	33.63	.....	.....	.....	.....	.....	.....	.....	.....
				3	.....	16.18	83.82	.....	.....	.....	.....	.....	.....	.....	.....	.....

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
ARKANSAS—Continued.																
SEBASTIAN COUNTY.																
Hackett; Branner No. 2 mine, Hartshorne (Huntington) bed (face of 22 room, 5 west level, 2,300 feet from pit mouth).	.....	18062	A	1	3.55	15.73	65.56	15.16	1.67	4.11	72.56	1.62	4.88	2.7	6,967	12,541
				2	.....	16.31	67.97	15.72	1.73	3.86	75.23	1.68	1.78	.....	7,223	13,001
				3	.....	19.35	80.65	.....	2.05	4.58	89.26	1.99	2.12	.....	8,570	15,426
Same (face of 7 west level, main slope)	.....	18063	A	1	3.56	17.45	60.78	18.21	1.39	3.95	69.59	1.58	5.28	2.6	6,619	11,914
				2	.....	18.09	63.03	18.88	1.44	3.68	72.16	1.64	2.20	.....	6,863	12,353
				3	.....	22.30	77.70	.....	1.78	4.54	88.95	2.02	2.71	.....	8,460	15,228
Jenny Lind, 1½ miles southwest of; Jenny Lind No. 17 mine, Hartshorne bed (22 room neck, "U" entry, main slope, 6,500 feet from shaft).	.....	18267	A	1	2.03	17.08	71.39	9.50	1.39	4.07	79.87	1.68	3.49	1.5	7,644	13,759
				2	.....	17.43	72.87	9.70	1.42	3.92	81.52	1.71	1.73	.....	7,802	14,044
				3	.....	19.30	80.70	1.00	1.57	4.34	90.28	1.89	1.92	.....	8,640	15,552
COLORADO.																
ELBERT COUNTY.																
Mattison, 4 miles east of; sec. 21, T. 10 S., R. 58 W.; Barker strip pit (back end of pit; coal slightly weathered).	.....	*19902	B	1	33.10	25.61	25.63	15.66	.44	6.20	36.78	.70	40.22	23.5	3,415	6,147
				2	.....	38.28	38.31	23.41	.66	3.77	54.98	1.05	16.13	.....	5,105	9,189
				3	.....	49.98	50.02	.....	.86	4.92	71.79	1.37	21.06	.....	6,666	11,999
GARFIELD COUNTY.																
New Castle, 2 miles east of; sec. 1, T. 6 S., R. 91 W.; Vulcan mine, Allen bed (face of east entry).	.....	18366	A	1	6.77	40.49	46.46	6.28	.51	5.76	70.33	1.61	15.51	4.1	7,022	12,640
				2	.....	43.43	49.83	6.74	.55	5.37	75.44	1.73	10.17	.....	7,532	13,558
				3	.....	46.57	53.43	.....	.59	5.76	80.89	1.86	10.90	.....	8,077	14,539
Same (face of 23 room)	.....	18376	A	1	4.56	42.92	46.08	6.44	.52	5.60	71.44	1.51	14.49	1.7	7,111	12,800
				2	.....	44.97	48.28	6.75	.54	5.33	74.85	1.58	10.95	.....	7,451	13,412
				3	.....	48.23	51.77	.....	.58	5.72	80.27	1.69	11.74	.....	7,990	14,382
LA PLATA COUNTY.																
Durango, about 27½ miles southwest of; sec. 14, T. 32 N., R. 12 W.; Cinder Butte mine, B bed (at back of entry).	.....	17747	B	1	11.64	31.38	40.08	16.90	.61	.....	.....	.....	.....	1.4	4,613	8,303
				2	.....	35.51	45.36	19.13	.69	.....	.....	.....	.....	.....	5,221	9,398
				3	.....	43.91	56.09	.....	.85	.....	.....	.....	.....	.....	6,456	11,621

About 25 miles southwest of; sec. 1, T. 32 N., R. 12 W.; Soda Spring mine, B bed (100 feet west of opening).	.....	17748	B	1	4.21	36.14	44.57	15.08	.69	.....	.....	.....	.....	.7	6,502	11,704
				2	.....	37.73	46.53	15.74	.72	.....	.....	.....	.....	.....	6,788	12,218
				3	.....	44.78	55.22	.....	.85	.....	.....	.....	.....	.....	8,056	14,501
Hesperus, 12 miles south of; sec. 17, T. 33 N., R. 11 W.; Mormon mine (near end of entry, 50 feet from opening).	.....	17745	B	1	4.66	36.78	45.04	13.52	.86	5.47	66.56	1.51	12.08	1.3	6,639	11,950
				2	.....	38.58	47.24	14.18	.90	5.19	69.81	1.58	8.34	.....	6,964	12,535
				3	.....	44.95	55.05	.....	1.05	6.05	81.34	1.84	9.72	.....	8,114	14,605
7½ miles southwest of; sec. 31, T. 35 N., R. 11 W.; Wheeler mine, "Upper No. 5" bed (near end of entry, 75 feet from mouth).	.....	17855	B	1	5.80	37.21	50.28	6.71	.58	5.67	71.41	1.61	14.02	2.5	7,027	12,649
				2	.....	39.50	53.38	7.12	.62	5.34	75.81	1.71	9.40	.....	7,460	13,428
				3	.....	42.53	57.47	.....	.67	5.75	81.62	1.84	10.12	.....	8,032	14,458
Mancos, 6 miles southeast of; sec. 7, T. 35 N., R. 12 W.; Hauert mine, Spencer bed (60 feet west of opening).	.....	20268	B	1	15.74	31.72	44.48	8.06	.58	5.65	59.59	1.19	24.93	11.5	5,706	10,271
				2	.....	37.65	52.78	9.57	.69	4.63	70.72	1.41	12.98	.....	6,772	12,190
				3	.....	41.63	58.37	.....	.76	5.12	78.20	1.56	14.36	.....	7,488	13,478
MOFFAT COUNTY.																
Craig 15 miles south and 1 mile west of; T. 4 N., R. 90 W.; Hart mine (100 feet northwest from entrance).	.....	17782	B	1	11.87	36.78	45.63	5.72	.55	5.83	64.36	1.40	22.14	1.8	6,241	11,234
				2	.....	41.73	51.78	6.49	.62	5.12	73.03	1.59	13.15	.....	7,082	12,748
				3	.....	44.63	55.37	.....	.66	5.48	78.10	1.70	14.06	.....	7,573	13,631
¾ mile north of; sec. 32, T. 7 N., R. 90 W.; Kimberly mine (120 feet from opening).	.....	*17593	B	1	22.10	31.61	41.95	4.34	.72	6.01	55.39	1.18	32.36	5.1	5,165	9,297
				2	.....	40.58	53.85	5.57	.92	4.56	71.10	1.51	16.34	.....	6,630	11,934
				3	.....	42.97	57.03	.....	.97	4.83	75.29	1.60	17.31	.....	7,021	12,638
16 miles south of; T. 4 N., R. 91 W.; Roby mine (75 feet northwest from opening.	.....	17840	B	1	14.20	36.26	45.36	4.18	.59	5.82	63.54	1.22	24.65	2.2	6,098	10,976
				2	.....	42.26	52.87	4.87	.69	4.94	74.06	1.42	14.02	.....	7,107	12,793
				3	.....	44.42	55.58	.....	.73	5.19	77.85	1.49	14.74	.....	7,471	13,448
8 miles northwest of; sec. 2, T. 7 N., R. 92 W.; Seick mine (120 feet N., 80° E. from opening).	.....	*17592	B	1	23.26	29.59	40.02	7.13	.65	5.79	54.00	.68	31.75	7.8	4,926	8,867
				2	.....	38.56	52.15	9.29	.85	4.18	70.37	.89	14.42	.....	6,419	11,554
				3	.....	42.51	57.49	.....	.94	4.61	77.58	.98	15.89	.....	7,076	12,737
sec. 17, T. 6 N., R. 90 W.; Walker mine (580 feet N., 55° W. from mine mouth).	.....	22725	B	1	16.82	36.39	41.92	4.87	.81	.....	.....	.....	.....	4.8	5,854	10,537
				2	.....	43.75	50.40	5.85	.97	.....	.....	.....	.....	.....	7,038	12,668
				3	.....	46.47	53.53	.....	1.03	.....	.....	.....	.....	.....	7,475	13,455
7 miles north of; sec. 28, T. 8 N., R. 93 W.; Blevins mine (about 140 feet N., 50° W. from opening).	.....	*17696	B	1	18.94	30.41	44.36	6.29	.64	5.71	57.47	.82	29.07	6.1	5,401	9,722
				2	.....	37.52	54.72	7.76	.79	4.45	70.90	1.01	15.09	.....	6,663	11,993
				3	.....	40.68	59.32	.....	.86	4.82	76.86	1.09	16.37	.....	7,223	13,001
Lay, 1½ miles southeast of; sec. 31, T. 7 N., R. 93 W.; Lay mine (270 feet south of opening).	.....	17686	B	1	11.71	38.00	44.33	5.96	.92	5.84	63.99	1.14	22.15	2.4	6,212	11,182
				2	.....	43.04	50.21	6.75	1.04	5.14	72.48	1.29	13.30	.....	7,036	12,665
				3	.....	46.16	53.84	.....	1.12	5.51	77.73	1.38	14.26	.....	7,545	13,581
MONTEZUMA COUNTY.																
Cortez, 6 miles southeast of; sec. 25, T. 35 N., R. 16 W.; Todd mine, Spencer bed (face of room on left, 85 feet from mine mouth).	.....	20267	B	1	12.10	37.70	44.13	6.07	.59	5.96	64.41	1.41	21.56	8.7	6,330	11,394
				2	.....	42.89	50.20	6.91	.67	5.26	73.28	1.60	12.28	.....	7,202	12,964
				3	.....	46.07	53.93	.....	.72	5.65	78.72	1.72	13.19	.....	7,736	13,925
Mancos, 2 miles southeast of; sec. 2, T. 35 N., R. 13 W.; Fielding-Spencer mine, Spencer bed (face of right entry, 400 feet from mouth of of mine).	.....	20499	B	1	5.51	38.35	47.29	8.85	.77	5.59	69.92	1.33	13.54	3.2	6,971	12,548
				2	.....	40.59	50.04	9.37	.81	5.27	74.00	1.41	9.14	.....	7,377	13,279
				3	.....	44.79	55.21	.....	.89	5.81	81.65	1.56	10.09	.....	8,140	14,652
2 miles southeast of; sec. 3, T. 35 N., R. 13 W.; Old Spencer mine, Peacock bed (face of north entry, 700 feet from mouth of mine).	.....	20498	B	1	8.46	39.25	46.96	5.33	.99	5.96	69.99	1.31	16.42	6.2	6,976	12,557
				2	.....	42.88	51.30	5.82	1.08	5.48	76.46	1.43	9.73	.....	7,621	13,718
				3	.....	45.53	54.47	.....	1.15	5.82	81.19	1.52	10.32	.....	8,092	14,566
2 miles southeast of; sec. 3, T. 35 N., R. 13 W.; Spencer mine, Spencer bed (room on right of entry, 500 feet from mine mouth).	.....	20500	B	1	6.96	38.36	50.21	4.47	.61	5.70	72.57	1.33	15.32	4.6	7,186	12,935
				2	.....	41.23	53.97	4.80	.66	5.30	78.00	1.43	9.81	.....	7,724	13,903
				3	.....	43.31	56.69	.....	.69	5.57	81.93	1.50	10.31	.....	8,113	14,603

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratary No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
COLORADO—Continued.																
ROUTT COUNTY.																
Hayden, 7 miles southwest of; sec. 6, T. 5 N., R. 89 W.; Carey mine (140 feet from mine mouth).	.....	*22775	B	1	16.85	32.25	45.48	5.42	.39	.....	.....	.....	.....	4.5	5,756	10,361
				2	.....	38.78	54.70	6.52	.47	.....	.....	.....	.....	.....	6,922	12,460
				3	.....	41.48	58.52	.....	.50	.....	.....	.....	.....	.....	7,404	13,327
5 miles south of; sec. 4, T. 5 N., R. 88 W.; Dry Creek mine (515 feet southwest of opening).	.....	*23024	B	1	15.89	32.94	47.35	3.82	.38	.....	.....	.....	.....	7.9	6,059	10,906
				2	.....	39.16	56.30	4.54	.45	.....	.....	.....	.....	.....	7,204	12,967
				3	.....	41.02	58.98	.....	.47	.....	.....	.....	.....	.....	7,547	13,585
Milner, 2 miles south of; Curtis No. 1 mine; Curtis bed (face of main slope, 270 feet from mine mouth).	.....	22750	B	1	11.73	37.01	43.73	7.53	.64	.....	.....	.....	.....	2.8	6,131	11,036
				2	.....	41.93	49.54	8.53	.73	.....	.....	.....	.....	.....	6,946	12,503
				3	.....	45.84	54.16	.....	.80	.....	.....	.....	.....	.....	7,594	13,669
½ mile west of; Schuster mine (face of main entry, 250 feet from mine mouth).	.....	22749	B	1	14.14	36.80	43.90	5.16	.47	.....	.....	.....	.....	2.7	6,044	10,879
				2	.....	42.86	51.13	6.01	.55	.....	.....	.....	.....	.....	7,039	12,670
				3	.....	45.60	54.40	.....	.59	.....	.....	.....	.....	.....	7,489	13,480
Mount Harris, 2 miles east of; sec. 11, T. 6 N., R. 87 W.; Bear River mine (about 375 feet west of mine mouth).	.....	22724	B	1	10.47	37.40	47.08	5.05	.51	.....	.....	.....	.....	3.3	6,514	11,725
				2	.....	41.77	52.59	5.64	.57	.....	.....	.....	.....	.....	7,275	13,095
				3	.....	44.27	55.73	.....	.60	.....	.....	.....	.....	.....	7,710	13,878
At; SW. ¼ SW. ¼ sec. 15, T. 6 N., R. 87 W.; Colorado & Utah No. 1 mine, Harris bed (face of main entry, 2,600 feet south of mine mouth).	.....	22737	B	1	10.63	38.40	45.88	5.09	.43	.....	.....	.....	.....	2.7	6,458	11,624
Same (on main dip entry, 1,700 feet southwest of mine mouth).	.....	22738	B	1	10.30	37.74	45.64	6.32	.42	.....	.....	.....	.....	2.5	6,401	11,522
Same (face of Hill entry, 800 feet southeast of mine mouth)	.....	22739	B	1	10.40	38.52	43.80	7.28	.46	.....	.....	.....	.....	2.9	6,285	11,313
Same (composite of samples 22737, 22738, and 22739)	.....	22740	B	1	10.39	37.90	45.49	6.22	.42	5.85	64.87	1.59	21.05	2.7	6,372	11,470
				2	.....	42.29	50.77	6.94	.47	5.24	72.39	1.77	13.19	.....	7,111	12,800
				3	.....	45.44	54.56	.....	.51	5.63	77.79	1.90	14.17	.....	7,641	13,754
½ mile northeast of; International mine, Wolf Creek bed (air course 300 feet from mine mouth).	.....	22736	B	1	9.81	36.82	40.76	12.61	.44	.....	.....	.....	.....	2.6	5,946	10,703
				2	.....	40.83	45.19	13.98	.49	.....	.....	.....	.....	.....	6,593	11,867
				3	.....	47.46	52.54	.....	.57	.....	.....	.....	.....	.....	7,664	13,795

ILLINOIS.

FRANKLIN COUNTY.

Buckner, ½ mile east of; No. 2 mine, No. 6 bed (face of main east entry, 3,600 feet east of shaft).	.....	23473	A	1	9.28	34.21	47.76	8.75	1.10	.....	.....	.....	.....	4.0	6,639	11,950
Same (face of 5 south entry, main east entry, 3,000 feet southeast of shaft).	.....	23474	A	1	8.91	35.51	47.46	8.12	.80	.....	.....	.....	.....	3.8	6,713	12,083
Same (face of 3 south entry, main east entry, 3,000 feet south of shaft).	.....	23475	A	1	8.82	33.91	48.87	8.40	.81	.....	.....	.....	.....	2.3	6,688	12,038
Same (face of 27 room, 8 panel, 4 north entry, main west entry, 2,400 feet northeast of shaft).	.....	23476	A	1	9.25	33.76	48.08	8.91	1.07	.....	.....	.....	.....	2.6	6,610	11,898
Same (face of 6 panel, 3 north entry, main west entry, 1,900 feet north of shaft).	.....	23477	A	1	8.75	33.71	48.44	9.10	1.55	.....	.....	.....	.....	2.7	6,635	11,943
Same (composite of samples 23473, 23474, 23475, 23476, and 23477)	.....	23478	A	1	9.01	34.52	47.87	8.60	1.08	5.45	67.37	1.38	16.12	3.1	6,650	11,970
				2	.....	37.94	52.61	9.45	1.19	4.89	74.04	1.52	8.91	.....	7,308	13,154
				3	.....	41.90	58.10	.....	1.31	5.40	81.77	1.68	9.84	.....	8,071	14,528
Christopher, 1 mile east of; United No. 1 mine, No. 6 bed (19 room, 7 east panel, 8 southeast entry).	.....	22686	A	1	9.33	33.60	48.48	8.59	.82	.....	.....	.....	.....	4.0	6,569	11,824
Same (6 room, 5 panel, 4 south entry)	.....	22687	A	1	9.05	33.74	48.65	8.56	.96	.....	.....	.....	.....	3.0	6,588	11,858
Same (6 room, 2 west panel, 9 northeast entry)	.....	22688	A	1	8.59	34.66	48.89	7.86	.92	.....	.....	.....	.....	3.0	6,716	12,089
Same (9 room, 8 panel, 8 southeast entry)	.....	22689	A	1	8.91	33.87	49.21	8.01	.99	.....	.....	.....	.....	2.9	6,676	12,017
Same (face of 5 south entry, 250 feet south of 5 panel)	.....	22690	A	1	10.06	33.92	47.26	8.76	.92	.....	.....	.....	.....	3.8	6,531	11,756
Same (composite of samples 22686, 22687, 22688, 22689, and 22690)	.....	22691	A	1	9.19	33.80	48.61	8.40	.92	5.49	67.25	1.52	16.42	3.3	6,625	11,925
				2	.....	37.22	53.53	9.25	1.01	4.92	74.06	1.67	9.09	.....	7,295	13,131
				3	.....	41.01	58.99	.....	1.11	5.42	81.61	1.84	10.02	.....	8,038	14,468
Orient, Orient mine, No. 6 bed (face of 4 east entry, main south entry, 1,500 feet south from shaft).	.....	23442	A	1	9.72	32.91	48.92	8.45	.87	.....	.....	.....	.....	5.6	6,592	11,866
Same (face of main west entry, 2,850 feet west from shaft)	.....	23443	A	1	10.24	32.54	49.49	7.73	.80	.....	.....	.....	.....	5.1	6,634	11,941
Same (composite of samples 23442 and 23443)	.....	23444	A	1	9.93	33.13	48.77	8.17	.75	5.46	67.08	1.41	17.13	5.3	6,609	11,896
				2	.....	36.78	54.15	9.07	.83	4.84	74.47	1.57	9.22	.....	7,337	13,207
				3	.....	40.45	59.55	.....	.91	5.32	81.89	1.73	10.15	.....	8,068	14,522
Royalton, North mine, No. 6 bed (face of 4 north entry, 2 main west entry).	.....	20080	A	1	9.33	31.15	50.36	9.16	.56	.....	.....	.....	.....	6.5	6,559	11,806
Same (face of 27 room, 1 north entry, 1 main east entry)	.....	20081	A	1	10.01	29.93	50.08	9.98	.52	.....	.....	.....	.....	7.4	6,401	11,522
Same (face of 1 main east entry, main north entry)	.....	20082	A	1	9.25	31.03	51.02	8.70	.48	.....	.....	.....	.....	6.7	6,587	11,857
Same (composite of samples 20080, 20081, and 20082)	.....	20083	A	1	9.61	30.68	50.44	9.27	.50	5.37	66.67	1.43	16.76	6.9	6,514	11,725
				2	.....	33.94	55.80	10.26	.55	4.76	73.76	1.58	9.09	.....	7,206	12,971
				3	.....	37.82	62.18	.....	.61	5.30	82.19	1.76	10.14	.....	8,030	14,454
Same (face of 2 west-south entry, about 2,000 feet west of shaft)	.....	20723	A	1	8.21	32.46	49.00	10.33	.96	.....	.....	.....	.....	4.3	6,539	11,770
Same (face of 26 room, 3 southwest entry, near entry)	.....	20724	A	1	9.07	32.24	48.42	10.27	1.14	.....	.....	.....	.....	4.9	6,448	11,606
Same (face of 1 east south entry)	.....	20725	A	1	9.83	31.44	51.53	7.20	.50	.....	.....	.....	.....	5.2	6,661	11,990
Same (composite of samples 20723, 20724, and 20725)	.....	20726	A	1	8.87	32.72	49.05	9.36	.94	5.05	66.81	1.52	16.32	4.8	6,547	11,785
				2	.....	35.90	53.83	10.27	1.03	4.46	73.31	1.67	9.26	.....	7,184	12,931
				3	.....	40.01	59.99	.....	1.15	4.97	81.70	1.86	10.32	.....	8,007	14,413
West Frankfort; West Frankfort No. 1 mine, No. 6 bed (face of 1 southwest entry, about 100 feet inby 4 east entry).	.....	22915	A	1	9.78	32.29	49.73	8.20	1.02	.....	.....	.....	.....	5.7	6,589	11,860
Same (face of 1 northeast entry, 60 feet inby 6 west entry)	.....	22916	A	1	10.23	31.97	49.87	7.93	.91	.....	.....	.....	.....	6.2	6,577	11,839
Same (opposite 15 room neck, at face of 4 west entry, 2 southwest entry).	.....	22917	A	1	10.48	33.53	49.02	6.97	1.22	.....	.....	.....	.....	5.8	6,629	11,932
Same (face of main west entry, about 1,000 feet from 2 north and 2 southwest entry).	.....	22918	A	1	8.86	33.27	49.48	8.39	.86	.....	.....	.....	.....	4.6	6,650	11,970

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
ILLINOIS—Continued.																
FRANKLIN COUNTY—continued.																
West Frankfort; West Frankfort No. 1 mine, No. 6 bed (face of 2 main north entry, 60 feet inby 6 west entry).	.....	22919	A	1	10.48	31.87	49.10	8.55	1.16	.....	.....	.....	.....	6.1	6,488	11,678
Same (face of 11 room, 30 feet from 3 east entry, 2 northeast entry)	.....	22920	A	1	10.16	32.66	49.63	7.56	.99	.....	.....	.....	.....	4.3	6,623	11,921
Same (composite of samples 22915, 22916, 22917, 22918, 22919, and 22920).	.....	22921	A	1	9.99	32.82	49.27	7.92	1.03	5.52	66.80	1.57	17.16	5.5	6,587	11,857
				2	.....	36.46	54.74	8.80	1.14	4.90	74.21	1.74	9.21	.....	7,318	13,172
				3	.....	39.98	60.02	.....	1.25	5.37	81.37	1.91	10.10	.....	8,024	14,443
GALLATIN COUNTY.																
Shawneetown, 8 miles southwest of; sec. 35, T. 10 S., R. 9 E.; country bank, four-foot bed (200 feet north from mouth of slope).	.....	23424	B	1	3.41	35.21	52.47	8.91	2.91	.....	.....	.....	.....	1.3	7,329	13,192
				2	.....	36.45	54.33	9.22	3.01	.....	.....	.....	.....	.....	7,588	13,658
				3	.....	40.15	59.85	.....	3.32	.....	.....	.....	.....	.....	8,359	15,046
6 miles southwest of; sec. 27, T. 10 S., R. 9 E.; middle mine of Saline mines, No. 5 bed (300 feet east of mouth of slope).	.....	23425	B	1	3.93	36.82	51.04	8.21	2.80	.....	.....	.....	.....	2.0	7,281	13,106
				2	.....	38.33	53.12	8.55	2.91	.....	.....	.....	.....	.....	7,579	13,642
				3	.....	41.91	58.09	.....	3.18	.....	.....	.....	.....	.....	8,288	14,918
4 miles southwest of; sec. 9, T. 10 S., R. 9 E.; Strong mine, Herrin or No. 6 bed (400 feet northwest of slope opening).	.....	23426	B	1	3.70	37.72	49.17	9.41	3.03	.....	.....	.....	.....	1.8	7,215	12,987
				2	.....	39.17	51.06	9.77	3.15	.....	.....	.....	.....	.....	7,493	13,487
				3	.....	43.41	56.59	.....	3.49	.....	.....	.....	.....	.....	8,304	14,947
MACOUPIN COUNTY.																
Gillespie, 2½ miles southwest of; Superior No. 1 mine, Herrin coal (Belleville, No. 6) (11 room, 3 south entry, 5 east south entry).	.....	18545	A	1	12.90	37.80	39.77	9.53	4.23	5.62	59.65	1.18	19.79	9.9	6,029	10,852
Same (1 room, 1 south entry, 5 east north entry)	.....	18546	A	1	14.16	35.53	40.21	10.10	3.70	5.64	58.45	1.13	20.98	11.3	5,897	10,615
Same (composite of samples 18545 and 18546)	.....	18553	A	1	13.59	37.20	39.33	9.88	3.86	5.65	59.41	1.12	20.08	10.6	5,945	10,701
				2	.....	43.05	45.52	11.43	4.47	4.79	68.76	1.30	9.25	.....	6,880	12,384
				3	.....	48.61	51.39	.....	5.05	5.41	77.64	1.47	10.43	.....	7,768	13,982
Same (run-of-mine coal from carload shipped to Pittsburgh station for testing purposes).	.....	18910	C	1	12.38	36.88	37.50	13.24	5.05	5.37	56.94	1.00	18.40	6.7	5,756	10,361
				2	.....	42.09	42.80	15.11	5.76	4.55	64.99	1.14	8.45	.....	6,569	11,825
				3	.....	49.58	50.42	.....	6.79	5.36	76.56	1.34	9.95	.....	7,738	13,928

MONTGOMERY COUNTY.															
Panama; Shoal Creek No. 1 mine, Herrin coal (Belleville, No. 6) (face of 15 room neck, 7 south stub entry, 7 east south entry).	.....	21901	A	1	14.87	33.42	40.70	11.01	3 26	.....	.....	.....	.....	10.2	5,821	10,478
Same (face of 9 west north entry, 150 feet inby back north main entry).	.....	21902	A	1	12.70	35.52	40.16	11.62	4.15	.....	.....	.....	.....	8.1	5,927	10,669
Same (face of 5 south stub entry, 7 east south entry)	.....	21903	A	1	13.04	34.06	39.58	13.32	4.84	.....	.....	.....	.....	8.7	5,723	10,301
Same (face of 10 east north entry, 200 feet inby 2 north stub entry).	.....	21904	A	1	13.43	35.06	40.96	10.55	3.82	.....	.....	.....	.....	8.7	5,962	10,732
Same (face of 1 north stub entry, 7 east south entry)	.....	21905	A	1	13.31	34.86	40.42	11.41	4.02	.....	.....	.....	.....	8.8	5,900	10,620
Same (composite of samples 21901, 21902, 21903, 21904, and 21905)	.....	21906	A	1	13.48	34.84	40.13	11.55	4.03	5.56	58.33	1.19	19.34	8.9	5,860	10,548
				2	.....	40.27	46.38	13.35	4.66	4.69	67.42	1.38	8.50	.....	6,773	12,191
				3	.....	46.48	53.52	.....	5.38	5.41	77.81	1.59	9.81	.....	7,817	14,071
PEORIA COUNTY.																
Bartonville, 1 mile west of; Collier mine, No. 5 bed (face of 6 north entry, main west entry).	.....	21032	A	1	15.66	34.74	40.38	9.22	2.64	.....	.....	.....	.....	13.3	5,999	10,798
Same (face of 1 room, 4 north entry, inby 3 north parting)	.....	21033	A	1	15.38	34.51	39.48	10.63	2.75	.....	.....	.....	.....	13.6	5,914	10,645
Same (face of 5 north entry, main west entry)	.....	21034	A	1	15.34	34.25	40.80	9.61	3.11	.....	.....	.....	.....	13.4	5,967	10,741
Same (composite of samples 21032, 21033, and 21034)	.....	21035	A	1	15.44	34.72	39.81	10.03	2.85	5.93	59.19	1.14	20.86	13.4	5,969	10,744
				2	.....	41.06	47.08	11.86	3.37	4.98	70.00	1.35	8.44	.....	7,059	12,706
				3	.....	46.59	53.41	.....	3.82	5.65	79.42	1.53	9.58	.....	8,009	14,416
Hanna City: Hanna City mine No. 5 bed (face of 2 north entry, 6 west entry, main north entry, 3,500 feet from shaft).	.....	22982	A	1	15.03	34.56	39.05	11.36	2.64	.....	.....	.....	.....	7.8	5,828	10,490
Same (face of 1 north entry, 6 east entry, main north entry, 3,200 feet from shaft).	.....	22983	A	1	15.41	33.87	38.85	11.87	2.88	.....	.....	.....	.....	10.5	5,770	10,386
Same (5 room, 1 south entry, 6 east entry, main north entry, 2,500 feet from shaft).	.....	22984	A	1	15.51	34.77	38.69	11.03	2.62	.....	.....	.....	.....	7.8	5,827	10,489
Same (face of 6 west entry, main north entry, 3,400 feet from shaft).	.....	22985	A	1	15.57	34.08	38.18	12.17	3.42	.....	.....	.....	.....	9.5	5,713	10,283
Same (composite of samples 22982, 22983, 22984, and 22985)	.....	22986	A	1	15.41	34.34	38.52	11.73	2.97	5.65	57.96	1.12	20.57	8.9	5,790	10,422
				2	.....	40.60	45.53	13.87	3.51	4.66	68.52	1.32	8.12	.....	6,845	12,321
				3	.....	47.14	52.86	.....	4.08	5.41	79.55	1.53	9.43	.....	7,947	14,305
PERRY COUNTY.																
Duquoin, 5 miles east of; Majestic mine, No. 6 bed (38 room neck, face of 6 southwest entry, 2,450 feet southwest of shaft).	.....	20728	A	1	10.88	32.97	47.20	8.95	1.15	.....	.....	.....	.....	8.2	6,322	11,380
Same (face of 11 southeast entry, 20 feet inby 5 west entry, 2,900 feet southeast of shaft).	.....	20729	A	1	10.20	33.08	49.63	7.09	.80	.....	.....	.....	.....	7.3	6,527	11,749
Same (face of main east entry, about 50 feet inby 11 and 12 north entries, 2,830 feet east of shaft).	.....	20730	A	1	11.47	32.05	48.44	8.04	.92	.....	.....	.....	.....	8.7	6,359	11,446
Same (face of 3 northwest entry, 800 feet west and 3,100 feet north of shaft).	.....	20731	A	1	10.64	32.78	48.93	7.65	.68	.....	.....	.....	.....	7.8	6,456	11,621
Same (face of 13 room, 8 northwest entry, 2,150 feet west and 700 feet north of shaft).	.....	20732	A	1	11.54	32.16	49.35	6.95	.85	.....	.....	.....	.....	8.5	6,432	11,578
Same (face of 9 north entry, main east entry, 20 feet inby 28 room)	.....	20733	A	1	10.99	32.24	48.32	8.45	.72	.....	.....	.....	.....	8.1	6,359	11,446
Same (composite of samples 20728, 20729, 20730, 20731, 20732, and 20733).	.....	20734	A	1	11.03	32.40	48.64	7.93	.86	5.60	65.26	1.42	18.93	8.1	6,432	11,578
				2	.....	36.41	54.68	8.91	.97	4.92	73.34	1.60	10.26	.....	7,228	13,010
				3	.....	39.97	60.03	.....	1.06	5.40	80.51	1.76	11.27	.....	7,935	14,283
VERMILION COUNTY.																
Westville; Bunsen mine, No. 6 bed (from car of nut coal sampled at Pittsburgh experiment station).	.....	25413	C	1	15.62	35.59	39.97	8.82	1.68	5.82	61.09	1.13	21.46	5.6	6,025	10,845
				2	.....	42.18	47.37	10.45	1.99	4.84	72.40	1.34	8.98	.....	7,140	12,852
				3	.....	47.10	52.90	.....	2.22	5.40	80.85	1.50	10.03	.....	7,973	14,351

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample. Laboratory No.	Sample. Kind.	Sample. Condition.	Proximate. Moisture.	Proximate. Volatile matter.	Proximate. Fixed carbon.	Proximate. Ash.	Ultimate. Sulphur.	Ultimate. Hydrogen.	Ultimate. Carbon.	Ultimate. Nitrogen.	Ultimate. Oxygen.	Air-drying loss.	Calorific value. Calories.	Calorific value. British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
ILLINOIS—Continued.																
WILLIAMSON COUNTY.																
Herrin; C. & H. mine, No. 7 bed (from car of run-of-mine coal sampled at Pittsburgh experiment station).	.....	19714	C	1	7.28	32.03	50.00	10.69	1.91	5.06	66.55	1.57	14.22	1.5	6,558	11,804
				2	.....	34.54	53.93	11.53	2.06	4.58	71.77	1.69	8.37	.....	7,073	12,731
				3	.....	39.04	60.96	.....	2.33	5.18	81.12	1.91	9.46	.....	7,995	14,391
Near; Jeffrey mine, Herrin coal (Belleville, No. 6) (face of 13 room, 8 east entry, main south entry, 3,000 feet southeast of shaft).	.....	17719	A	1	8.77	32.64	51.41	7.18	1.10	.....	.....	.....	.....	2.1	6,765	12,177
				2	.....	35.78	56.35	7.87	1.21	.....	.....	.....	.....	.....	7,415	13,347
				3	.....	38.84	61.16	.....	1.31	.....	.....	.....	.....	.....	8,048	14,486
Same (face of 18 room, 3 west entry, main north entry, 1,500 feet northwest of shaft).	.....	17721	A	1	8.70	31.78	51.89	7.63	1.00	.....	.....	.....	.....	2.2	6,763	12,173
				2	.....	34.81	56.83	8.36	1.10	.....	.....	.....	.....	.....	7,408	13,334
				3	.....	37.98	62.02	.....	1.20	.....	.....	.....	.....	.....	8,084	14,551
Same (face of 42 room, 1 west entry, main south entry, 1,800 feet southwest of shaft).	.....	17720	A	1	9.37	32.83	49.63	8.17	1.70	.....	.....	.....	.....	2.7	6,660	11,988
				2	.....	36.22	54.77	9.01	1.88	.....	.....	.....	.....	.....	7,349	13,228
				3	.....	39.81	60.19	.....	2.07	.....	.....	.....	.....	.....	8,077	14,539
INDIANA.																
GIBSON COUNTY.																
Fort Branch, 1 mile south of; Fort Branch mine, No. 5 bed (face of 3 north entry, main east entry, 1,100 feet northeast of shaft).	.....	20365	A	1	6.04	38.36	45.57	10.03	3.62	.....	.....	.....	.....	4.0	6,771	12,188
Same (face of main west entry, 1,900 feet west of shaft)	.....	20366	A	1	6.69	38.13	47.20	7.98	3.73	.....	.....	.....	.....	4.4	6,875	12,375
Same (face of 2 north entry, main west entry, 2,000 feet northwest of shaft).	.....	20367	A	1	7.96	38.22	44.66	9.16	3.36	.....	.....	.....	.....	6.0	6,710	12,078
Same (composite of samples 20365, 20366, and 20367)	.....	20368	A	1	6.87	38.74	45.40	8.99	3.51	5.40	67.35	1.47	13.28	4.8	6,771	12,188
				2	.....	41.60	48.75	9.65	3.77	4.98	72.32	1.58	7.70	.....	7,271	13,088
				3	.....	46.04	53.96	.....	4.17	5.51	80.04	1.75	8.53	.....	8,048	14,486
KNOX COUNTY.																
Bicknell, 4 miles south of; Indian Creek mine, No. 5 bed (face of main south entry, 1,900 feet from shaft).	.....	18435	A	1	10.75	36.38	43.12	9.75	4.43	.....	.....	.....	.....	7.4	6,376	11,477
Same (rib of last open crosscut between 3 and 4 south entries, 4 east south entry, 2,200 feet from shaft).	.....	18436	A	1	10.87	37.68	42.86	8.59	4.19	.....	.....	.....	.....	7.6	6,475	11,655

Same (composite of samples 18435 and 18436)		18437	A	1	10.72	37.17	42.77	9.34	4.24	5.45	63.62	1.25	16.10	7.5	6,453	11,615
				2		41.63	47.91	10.46	4.75	4.77	71.26	1.40	7.36		7,228	13,010
				3		46.49	53.51		5.30	5.33	79.58	1.56	8.23		8,072	14,530
SULLIVAN COUNTY.																
Carlisle, ½ mile north of; Viola mine, No. 5 bed (face of 9 south entry, main east entry, 4,000 feet southeast of shaft).		22217	A	1	10.17	38.17	41.48	10.18	3.36					7.7	6,473	11,651
Same (near 3 room at face of 8 south entry, main east entry, 3,500 feet southeast of shaft).		22218	A	1	11.85	37.11	42.50	8.54	2.67					8.7	6,439	11,590
Same (face of 1 west entry, 5 south entry, main east entry, 3,000 feet south of shaft).		22219	A	1	11.25	36.75	43.26	8.74	2.70					8.5	6,496	11,693
Same (face of 5 room, 8 north entry, main east entry, 3,500 feet northeast of shaft).		22220	A	1	10.03	38.49	42.08	9.40	3.36					7.2	6,538	11,768
Same (composite of samples 22217, 22218, 22219, and 22220)		22221	A	1	10.80	37.57	42.44	9.19	2.96	5.78	64.38	1.21	16.48	8.0	6,493	11,687
				2		42.12	47.58	10.30	3.32	5.13	72.18	1.36	7.71		7,279	13,102
				3		46.96	53.04		3.70	5.72	80.47	1.52	8.59		8,115	14,607
Dugger, 1½ miles southwest of; Vandalia No. 10 mine, No. 4 bed (face of 7 room, 3 north entry, 2 east entry, 3 north entry, main east entry, 3,500 feet northeast of shaft).		23224	A	1	13.96	33.76	43.92	8.36	.92					12.0	6,238	11,228
Same (face of 8 room, 3 south entry, 1 east entry, 3 north entry, main east entry, 3,200 feet northeast of shaft).		23225	A	1	13.62	34.53	45.85	6.00	1.06					11.5	6,457	11,623
Same (face of 11 room, 1 east entry, 9 south entry, main east entry, 3,200 feet southeast of shaft).		23226	A	1	13.15	36.00	44.75	6.10	1.15					11.0	6,583	11,849
Same (composite of samples 23224, 23225, and 23226)		23227	A	1	13.60	34.97	44.58	6.85	1.06	5.84	64.78	1.44	20.03	11.5	6,414	11,545
				2		40.47	51.60	7.93	1.23	5.01	74.98	1.67	9.18		7,424	13,363
				3		43.95	56.05		1.34	5.44	81.44	1.81	9.97		8,063	14,513
VANDERBURG COUNTY.																
Evansville; Sunnyside mine, No. 5 bed (face of 4 east entry, main north entry, 3,400 feet northeast of shaft).		20249	A	1	10.60	34.64	44.99	9.77	2.65					8.7	6,325	11,385
Same (face of main north entry, 3,200 feet north of shaft)		20250	A	1	7.72	37.19	46.44	8.65	2.74					5.5	6,641	11,954
Same (head of main west entry, 3,800 feet west of shaft)		20251	A	1	9.99	35.84	44.04	10.13	2.67					7.9	6,342	11,416
Same (face of 5 west entry, 3,200 feet west of main shaft)		20252	A	1	10.64	34.59	42.83	11.94	3.77					8.9	6,115	11,007
Same (composite of samples 20249, 20250, 20251, and 20252)		20253	A	1	9.72	35.61	44.48	10.19	2.92	5.43	63.53	1.37	16.56	7.7	6,353	11,435
				2		39.45	49.26	11.29	3.23	4.82	70.37	1.52	8.77		7,037	12,667
				3		44.47	55.53		3.64	5.43	79.33	1.71	9.89		7,933	14,279
VERMILION COUNTY.																
Clinton, 2½ miles southwest of; Crown Hill No. 3 mine, No. 3 bed (face of last room, 4 west entry, 3 north entry, main west entry, 3,600 feet from shaft).		23212	A	1	12.05	38.14	41.03	8.78	3.35					9.9	6,370	11,466
Same (face of 3 room, 4 east entry, 3 north entry, main west entry, 3,000 feet from shaft).		23213	A	1	12.09	37.53	41.23	9.15	3.31					9.9	6,327	11,389
Same (14 room, main west entry)		23215	A	1	11.27	38.78	41.69	8.26	3.04					9.2	6,493	11,687
Same (face of 5 south entry, main west entry)		23216	A	1	10.94	38.33	41.86	8.87	3.16					8.8	6,456	11,621
Same (composite of samples 23212, 23213, 23215, and 23216)		23217	A	1	1.59	38.20	41.44	8.77	3.21	5.86	63.79	1.26	17.11	9.4	6,412	11,542
				2		43.21	46.87	9.92	3.63	5.17	72.15	1.43	7.70		7,253	13,055
				3		47.97	52.03		4.03	5.74	80.10	1.59	8.54		8,052	14,494

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
INDIANA—Continued.																
VERMILION COUNTY—continued.																
Clinton, 1¾ miles southwest of; Dering No. 1 mine, No. 3 bed (15 room, 1 east entry, 2 southeast entry).	.....	25345	A	1	11.08	38.80	39.78	10.34	4.29	.....	.....	.....	.....	6.8	6,316	11,369
Same (face of 10 room, 6 east entry, 2 northeast entry)	.....	25346	A	1	11.59	38.77	40.81	8.83	3.35	.....	.....	.....	.....	6.6	6,408	11,534
Same (face of 11 room, 5 west entry, 2 southwest entry)	.....	25347	A	1	10.64	40.15	41.15	8.06	3.08	.....	.....	.....	.....	5.7	6,564	11,815
Same (face of 1 room, 8 west entry, 2 north entry, main west entry).	.....	25348	A	1	11.94	39.05	41.37	7.64	2.96	.....	.....	.....	.....	7.4	6,482	11,668
Same (composite of samples 25345, 25346, 25347, and 25348)	.....	25349	A	1	11.39	38.87	41.10	8.64	3.48	5.91	63.62	1.07	17.28	6.6	6,430	11,574
				2	.....	43.86	46.39	9.75	3.93	5.24	71.80	1.21	8.07	.....	7,256	13,061
				3	.....	48.60	51.40	.....	4.35	5.81	79.55	1.34	8.95	.....	8,040	14,472
½ mile east of Blanford; West Clinton No. 1 mine, No. 5 bed (face of 3 east south entry, 40 feet inby 16 room).	.....	21874	A	1	11.72	39.81	40.23	8.24	2.53	.....	.....	.....	.....	6.9	6,457	11,623
Same (face of 5 room, 4 west south entry)	.....	21875	A	1	10.54	39.46	39.59	10.41	3.96	.....	.....	.....	.....	5.8	6,352	11,434
Same (composite of samples 21874 and 21875)	.....	21876	A	1	11.13	39.46	40.06	9.35	3.18	5.88	63.40	1.26	16.93	6.4	6,416	11,549
				2	.....	44.40	45.08	10.52	3.58	5.22	71.33	1.42	7.93	.....	7,219	12,994
				3	.....	49.62	50.38	.....	4.00	5.83	79.72	1.59	8.86	.....	8,068	14,522
VIGO COUNTY.																
Liggett, 6 miles west of Terre Haute; Vandalia No. 82 mine, No. 5 bed (face of A. W. entry, 2,200 feet southeast of shaft).	.....	23113	A	1	11.77	39.16	39.86	9.21	2.46	.....	.....	.....	.....	9.0	6,409	11,536
Same (face of B. F. entry, 1,900 feet northeast from shaft)	.....	23114	A	1	11.69	39.42	39.37	9.52	3.01	.....	.....	.....	.....	9.4	6,393	11,507
Same (face of 40 room, L entry, 2,200 feet south of shaft)	.....	23115	A	1	10.39	40.33	41.48	7.80	3.00	.....	.....	.....	.....	7.8	6,661	11,990
Same (face of 20 room, B. I. entry, 2,200 feet east of shaft)	.....	23116	A	1	11.61	38.22	39.54	10.63	3.27	.....	.....	.....	.....	9.1	6,280	11,304
Same (composite of samples 23113, 23114, 23115, and 23116)	.....	23117	A	1	11.42	39.08	40.32	9.18	3.01	5.78	63.77	1.19	17.07	8.8	6,444	11,599
				2	.....	44.12	45.52	10.36	3.40	5.09	71.99	1.34	7.82	.....	7,275	13,095
				3	.....	49.22	50.78	.....	3.79	5.68	80.31	1.49	8.73	.....	8,116	14,609
Same, (north side of west lead to double parting on C. I. entry, 1,400 feet northeast from shaft).	.....	24063	A	1	9.95	39.93	40.02	10.10	3.10	.....	.....	.....	.....	7.8	6,468	11,642
Same (south side of west lead to double parting on C. I. entry, 1,400 feet from shaft).	.....	24064	A	1	9.77	39.71	39.94	10.58	3.63	.....	.....	.....	.....	8.0	6,466	11,639
Same (composite of samples 24063 and 24064)	.....	24065	A	1	9.91	39.55	40.18	10.36	3.36	5.77	63.77	1.10	15.64	7.9	6,447	11,605
				2	.....	43.90	44.60	11.50	3.73	5.18	70.78	1.22	7.59	.....	7,156	12,881
				3	.....	49.60	50.40	.....	4.21	5.85	79.97	1.38	8.59	.....	8,086	14,555

KANSAS.																
CRAWFORD COUNTY.																
Pittsburg, 4 miles southwest of; Central mine, Cherokee bed (steam-shovel strip pit, 200 feet from outcrop, "dead coal").	.....	*23238	B	1	25.49	26.07	43.95	4.49	.71	5.69	53.39	1.00	34.72	19.1	4,882	8,788
				2	.....	34.99	58.98	6.03	.95	3.84	71.65	1.34	16.19	.....	6,552	11,794
				3	.....	37.24	62.76	.....	1.01	4.09	76.25	1.43	17.22	.....	6,973	12,551
Same (in strip pit 300 feet from outcrop, medium-grade coal)	.....	23239	B	1	6.55	33.52	54.17	5.76	1.68	5.39	74.18	1.30	11.69	4.0	7,358	13,245
				2	.....	35.87	57.97	6.16	1.80	4.99	79.38	1.39	6.28	.....	7,874	14,173
				3	.....	38.22	61.78	.....	1.92	5.32	84.59	1.48	6.69	.....	8,391	15,104
Same (near tipple, about 1,000 feet from outcrop, in steam-shovel strip pit, best "strip-pit" coal).	.....	23240	B	1	6.84	32.90	51.92	8.34	3.06	5.32	70.74	1.32	11.22	4.4	7,078	12,740
				2	.....	35.31	55.74	8.95	3.28	4.89	75.93	1.42	5.53	.....	7,598	13,676
				3	.....	38.78	61.22	.....	3.60	5.37	83.39	1.56	6.08	.....	8,345	15,021
Same (in steam-shovel strip pit near tipple, "dead" coal)	.....	*23244	B	1	33.42	24.43	36.51	5.64	.55	5.76	43.86	.97	43.22	25.1	3,801	6,842
				2	.....	36.69	54.84	8.47	.83	3.08	65.88	1.46	20.28	.....	5,709	10,276
				3	.....	40.08	59.92	.....	.91	3.36	71.97	1.60	22.16	.....	6,237	11,227
2 miles north of; Patton mine (¼ mile south of tipple)	.....	23237	B	1	6.43	34.57	46.31	12.69	3.23	5.20	66.72	1.19	10.97	4.9	6,713	12,084
				2	.....	36.94	49.50	13.56	3.45	4.80	71.30	1.27	5.62	.....	7,174	12,913
				3	.....	42.74	57.26	.....	3.99	5.55	82.49	1.47	6.50	.....	8,300	14,940
KENTUCKY.																
BELL COUNTY.																
Arjay; Glendon mine, Straight Creek bed (face of 8 right entry, 3,400 feet from mine opening).	.....	21557	A	1	3.01	38.89	56.03	2.07	1.11	.....	.....	.....	.....	1.1	7,963	14,333
Same (face of 12 right entry, 4,200 feet from mine opening)	.....	21558	A	1	2.72	38.43	56.10	2.75	.83	.....	.....	.....	.....	1.2	7,911	14,240
Same (face of 7 right entry, 2,000 feet from mine opening)	.....	21559	A	1	2.92	37.31	55.70	4.07	.83	.....	.....	.....	.....	.9	7,771	13,988
Same (face of 4 right entry, 3,200 feet from mine opening)	.....	21560	A	1	3.10	38.07	55.61	3.22	.73	.....	.....	.....	.....	1.1	7,855	14,139
Same (composite of samples 21557, 21558, 21559, and 21560)	.....	21561	A	1	2.97	37.75	56.34	2.94	.96	5.66	79.41	1.97	9.06	1.1	7,890	14,202
				2	.....	38.91	58.06	3.03	.99	5.49	81.84	2.03	6.62	.....	8,131	14,636
				3	.....	40.12	59.88	.....	1.02	5.66	84.39	2.09	6.84	.....	8,385	15,093
Chenoa, 1 mile southeast of; Chenoa Hignite mine, Lower Hignite bed (face of 6 right entry, 2,000 feet from mine opening).	.....	21786	A	1	3.24	36.61	53.69	6.46	1.45	.....	.....	.....	.....	1.2	7,424	13,363
				2	.....	37.84	55.48	6.68	1.50	.....	.....	.....	.....	.....	7,673	13,811
				3	.....	40.55	59.45	.....	1.61	.....	.....	.....	.....	.....	8,222	14,800
Same (face of main entry, 1,700 feet from mine opening)	.....	21787	A	1	8.37	35.73	51.64	4.26	.97	.....	.....	.....	.....	6.1	7,242	13,036
Same (face of 1 left entry, 1,500 feet from mine opening)	.....	21788	A	1	4.64	36.98	54.07	4.31	1.02	.....	.....	.....	.....	2.3	7,559	13,606
Same (face of 5 right entry, 2,000 feet from mine opening)	.....	21789	A	1	4.43	36.90	54.32	4.35	1.11	.....	.....	.....	.....	2.1	7,543	13,577
Same (composite of samples 21787, 21788, and 21789)	.....	21790	A	1	5.74	36.76	53.20	4.30	1.01	5.80	74.89	1.65	12.35	3.5	7,446	13,403
				2	.....	39.00	56.44	4.56	1.07	5.47	79.45	1.75	7.70	.....	7,899	14,218
				3	.....	40.86	59.14	.....	1.12	5.73	83.25	1.83	8.07	.....	8,277	14,899
2 miles southeast of; Log Mountain No. 1 mine, Mason bed (face of main entry, 1,900 feet from mine opening).	.....	21781	A	1	4.78	35.77	57.12	2.33	.69	.....	.....	.....	.....	2.7	7,736	13,925
Same (face of 5 left entry, 1,600 feet from opening)	.....	21782	A	1	4.16	35.98	57.79	2.07	.72	.....	.....	.....	.....	1.5	7,798	14,036
Same (face of 6 diagonal entry, 3,000 feet from mine opening)	.....	21783	A	1	4.39	36.22	56.31	3.08	1.05	.....	.....	.....	.....	2.2	7,672	13,810
Same (face of 4 right entry, 1,500 feet from mine opening)	.....	21784	A	1	4.45	36.00	57.36	2.19	.79	.....	.....	.....	.....	2.1	7,761	13,970
Same (composite of samples of 21781, 21782, 21783, and 21784)	.....	21785	A	1	4.35	36.11	57.12	2.42	.79	5.83	78.11	1.94	10.91	2.1	7,742	13,936
				2	.....	37.75	59.72	2.53	.83	5.59	81.66	2.03	7.36	.....	8,094	14,569
				3	.....	38.73	61.27	.....	.85	5.74	83.78	2.08	7.55	.....	8,304	14,947
Colmar, 1 mile north of; Armu mine, Mason bed (face of 5 left entry, 3,400 feet from mine opening).	.....	21681	A	1	2.28	38.59	54.46	4.67	1.33	.....	.....	.....	.....	.8	7,842	14,116
Same (face of 6 right entry, 2,200 feet from mine opening)	.....	21682	A	1	2.48	37.93	53.53	6.06	1.73	.....	.....	.....	.....	1.0	7,696	13,853
Same (face of 7 left entry, 2,300 feet from mine opening)	.....	21683	A	1	2.62	37.31	53.16	6.91	1.53	.....	.....	.....	.....	1.0	7,625	13,725

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
KENTUCKY—Continued.																
BELL COUNTY—continued.																
Colmar, 1 mile north of Armu mine, Mason bed (face of 2 left entry, 3,600 feet from mine opening)	.....	21684	A	1	2.26	39.10	53.78	4.86	1.47	.....	.....	.....	.....	0.6	7,854	14,137
Same (composite of samples 21681, 21682, 21683, and 21684)	.....	21685	A	1	2.54	38.20	53.72	5.54	1.51	5.53	77.25	2.07	8.10	.9	7,760	13,968
				2	.....	39.20	55.12	5.68	1.55	5.39	79.27	2.12	5.99	.....	7,963	14,333
				3	.....	41.56	58.44	.....	1.64	5.71	84.04	2.25	6.36	.....	8,442	15,196
Fourmile, 3 miles southwest of; East Jellico mine, Dean bed (face of 1 right entry, 3 main entry, 700 feet from mine opening)	.....	21796	A	1	3.71	35.39	53.71	7.19	.85	.....	.....	.....	.....	1.8	7,346	13,223
Same (face of 1 left entry, 3 main entry, 1,000 feet from mine opening).	.....	21797	A	1	3.93	33.83	54.19	8.05	1.12	.....	.....	.....	.....	2.0	7,224	13,003
Same (face of 1 right entry, 2 main entry, 750 feet from mine opening).	.....	21798	A	1	4.16	35.16	53.41	7.27	.69	.....	.....	.....	.....	2.3	7,295	13,131
Same (composite of samples 21796, 21797, and 21798)	.....	21799	A	1	3.91	34.64	53.95	7.50	.88	5.45	73.87	1.74	10.56	2.0	7,290	13,122
				2	.....	36.05	56.14	7.81	.92	5.22	76.88	1.81	7.36	.....	7,587	13,657
				3	.....	39.10	60.90	.....	1.00	5.66	83.39	1.96	7.99	.....	8,230	14,814
2 miles southwest of; Magnet mine, Dean bed (face of 4 left entry, 2,100 feet from mine opening).	.....	21791	A	1	3.88	36.35	53.96	5.81	.85	.....	.....	.....	.....	1.9	7,475	13,455
Same (face of 6 room, 3 right entry, 1,700 feet from mine opening)	.....	21792	A	1	3.58	36.28	53.19	6.95	.82	.....	.....	.....	.....	1.7	7,389	13,300
Same (face of 5 left entry, 2,200 feet from mine opening)	.....	21793	A	1	4.93	35.82	52.82	6.43	1.33	.....	.....	.....	.....	3.3	7,321	13,178
Same (face of main entry, 2,200 feet from mine opening)	.....	21794	A	1	4.50	35.62	54.00	5.88	1.00	.....	.....	.....	.....	2.8	7,422	13,360
Same (composite of samples 21791, 21792, 21793 and 21794)	.....	21795	A	1	4.29	35.96	53.47	6.28	1.00	5.53	74.30	1.79	11.10	2.4	7,398	13,316
				2	.....	37.57	55.87	6.56	1.04	5.28	77.63	1.87	7.62	.....	7,729	13,912
				3	.....	40.21	59.79	.....	1.11	5.65	83.08	2.00	8.16	.....	8,272	14,890
Fox Ridge; Fox Ridge mine, Straight Creek bed (face of 12 left entry, 4,600 feet from mine opening).	.....	21552	A	1	3.98	37.78	56.53	1.71	.85	.....	.....	.....	.....	2.3	7,951	14,312
Same (face of 12 right entry, 4,500 feet from mine opening)	.....	21553	A	1	3.64	38.85	54.94	2.57	1.38	.....	.....	.....	.....	1.9	7,924	14,263
Same (face of 10 right entry, 4,500 feet from mine opening)	.....	21554	A	1	3.09	38.15	57.60	1.16	.80	.....	.....	.....	.....	1.3	8,082	14,548
Same (face of main air course, 4,600 feet from mine opening)	.....	21555	A	1	4.51	36.31	57.00	2.18	1.07	.....	.....	.....	.....	2.6	7,854	14,137
Same (composite of samples 21552, 21553, 21554, and 21555)	.....	21556	A	1	3.84	37.68	56.60	1.88	1.02	5.75	79.58	1.90	9.87	2.0	7,960	14,328
				2	.....	39.18	58.86	1.96	1.06	5.53	82.76	1.98	6.71	.....	8,278	14,900
				3	.....	39.96	60.04	.....	1.08	5.64	84.42	2.02	6.84	.....	8,443	15,197

Harrison; Log Mountain No. 52 mine, Poplar Lick bed (face of 7 left entry, 3,200 feet from opening).	21617	A	1	3.33	37.04	53.63	6.00	1.06					1.0	7,545	13,581
Same (face of 7 right entry, 3,400 feet from mine opening)	21618	A	1	3.35	37.83	54.44	4.38	.96					1.1	7,679	13,822
Same (face of 2 face heading, 3,000 feet from mine opening)	21619	A	1	3.58	36.81	54.40	5.21	.96					1.2	7,577	13,639
Same (face of 5 left entry, 3,200 feet from mine opening)	21620	A	1	3.54	37.70	53.90	4.86	1.08					1.3	7,623	13,721
Same (composite of samples 21617, 21618, 21619, and 21620)	21621	A	1	3.37	37.52	54.03	5.08	1.01	5.59	76.50	1.99	9.83	1.2	7,616	13,709
			2	.....	38.83	55.91	5.26	1.05	5.40	79.17	2.06	7.06	.....	7,882	14,188
			3	.....	40.99	59.01	.....	1.11	5.70	83.56	2.17	7.46	.....	8,319	14,974
Kettle Island; Pioneer mine, Straight Creek bed (face of 6 left entry, 2,500 feet from mine opening).	21547	A	1	4.49	37.12	53.62	4.77	1.23					2.8	7,588	13,658
Same (face of 6 right entry, 2,700 feet from mine opening)	21548	A	1	4.55	37.46	52.95	5.04	1.50					3 0	7,616	13,709
Same (face of 4 left entry, 1,900 feet from mine opening)	21549	A	1	3.79	35.95	54.59	5.67	1.26					2.2	7,599	13,678
Same (face of 1 left entry, 2,000 feet from mine opening)	21550	A	1	3.94	37.13	55.82	3.11	1.30					2.3	7,865	14,157
Same (composite of samples 21547, 21548, 21549, and 21550)	21551	A	1	4.17	37.17	53.97	4.69	1.37	5.61	76.75	1.90	9.68	2.6	7,663	13,793
			2	.....	38.79	56.32	4.89	1.43	5.37	80.09	1.98	6.24	.....	7,996	14,393
			3	.....	40.78	59.22	.....	1.50	5.65	84.21	2.08	6.56	.....	8,407	15,133
Rim; Rim No. 4 mine, Hickory bed (face of 6 right entry, 3,200 feet from mine opening).	21622	A	1	3.17	35.25	52.22	9.36	1.24					1.3	7,270	13,086
Same (face of 6 left entry, 3,100 feet from mine opening)	21623	A	1	3.51	37.30	55.63	3.56	1.04					1.4	7,780	14,004
Same (face of 1 main entry, 3,200 feet from mine opening)	21624	A	1	3.58	36.76	56.25	3.41	.84					1.4	7,786	14,015
Same (face of 4 left entry, 2,400 feet from mine opening)	21625	A	1	3.48	37.69	54.41	4.42	1.02					1.5	7,721	13,898
Same (composite of samples 21622, 21623, 21624, and 21625)	21626	A	1	3.43	36.98	54.38	5.21	1.01	5.55	76.87	1.75	9.61	1.4	7,661	13,790
			2	.....	38.29	56.32	5.39	1.05	5.35	79.60	1.81	6.80	.....	7,933	14,279
			3	.....	40.47	59.53	.....	1.11	5.65	84.14	1.91	7.19	.....	8,385	15,093
Straight Creek; Barker No. 2 & 3 mine, Straight Creek bed (face of 4 right entry, 1½ miles from mine opening).	21567	A	1	2.92	38.27	55.30	3.51	1.22					1.4	7,832	14,098
Same (face of 5 north entry, 1½ miles from mine opening)	21568	A	1	3.28	37.55	56.83	2.34	1.17					1.6	7,898	14,216
Same (face of 3 right entry, 7 north entry, 1½ miles from mine opening).	21569	A	1	3.24	37.23	55.95	3.58	1.10					1.4	7,784	14,011
Same (face of 4 right entry, 3 main entry, about 1½ miles from mine opening).	21570	A	1	4.06	36.52	54.64	4.78	1.72					2.3	7,631	13,736
Same (face of 2 main entry, 1½ miles from mine opening)	21571	A	1	2.73	38.16	54.33	4.78	1.67					1.1	7,706	13,871
Same (composite of samples 21567, 21568, 21569, 21570, and 21571)	21572	A	1	3.27	37.51	55.42	3.80	1.31	5.58	78.06	1.97	9.28	1.6	7,791	14,024
			2	.....	38.78	57.29	3.93	1.35	5.40	80.70	2.04	6.58	.....	8,054	14,497
			3	.....	40.37	59.63	.....	1.41	5.62	84.00	2.12	6.85	.....	8,383	15,089
Tejay; Tejay mine, Mason or Creech bed (face of 6 right entry, 2,600 feet from mine opening).	21562	A	1	3.18	37.35	56.75	2.72	.85					1.9	7,884	14,191
Same (face of 4 left entry, 3,600 feet from mine opening)	21563	A	1	2.81	37.76	56.29	3.14	.95					1.1	7,911	14,240
Same (face of 4 right entry, 2,000 feet from mine opening)	21564	A	1	2.74	38.98	55.66	2.62	.99					1.1	7,954	14,317
Same (face of 7 left entry, 2,800 feet from mine opening)	21565	A	1	2.69	38.46	54.97	3.88	.96					1.0	7,854	14,137
Same (composite of samples, 21562, 21563, 21564, and 21565)	21566	A	1	2.92	37.98	56.04	3.06	.98	5.64	79.44	1.87	9.01	1.3	7,901	14,222
			2	.....	39.12	57.73	3.15	1.01	5.48	81.83	1.93	6.60	.....	8,139	14,650
			3	.....	40.39	59.61	.....	1.04	5.66	84.49	1.99	6.82	.....	8,404	15,127
Varilla; Varilla mine, Upper Hance bed (face of 2 main entry, 400 feet from mine opening).	21776	A	1	2.53	37.64	56.29	3.54	1.06					1.1	7,918	14,252
Same (face of 10 left entry, 3,700 feet from mine opening)	21777	A	1	2.25	38.13	55.09	4.53	1.55					.9	7,840	14,112
Same (face of 7 right entry, 3,200 feet from mine opening)	21778	A	1	2.04	39.06	52.37	6.53	2.65					.8	7,685	13,851
Same (face of 5 right entry, 3,700 feet from mine opening)	21779	A	1	2.32	37.37	55.37	3.94	1.03					.9	7,880	14,184
Same (composite of samples 21776, 21777, 21778, and 21779)	21780	A	1	2.34	37.82	55.24	4.60	1.57	5.71	78.18	1.96	7.98	.9	7,840	14,112
			2	.....	38.73	56.56	4.71	1.61	5.58	80.06	2.01	6.03	.....	8,028	14,450
			3	.....	40.64	59.36	.....	1.69	5.86	84.01	2.11	6.33	.....	8,425	15,165

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
KENTUCKY—Continued.																
BUTLER COUNTY.																
Morgantown, 1½ miles southwest of, 1½ miles from Green River; Gillam mine (left rib, 1 room, main west entry, 100 feet from entrance).	.....	19399	A	1	8.93	39.29	43.63	8.15	3.12	.....	.....	.....	.....	3.6	6,686	12,035
Same (left rib, 1 room, main west entry, 100 feet from entrance)	.....	19400	A	1	8.45	40.02	44.48	7.05	3.65	.....	.....	.....	.....	3.2	6,829	12,292
Same (composite of samples 19399 and 19400)	.....	19401	A	1	8.76	39.56	44.12	7.56	3.48	5.73	67.08	1.61	14.54	3.4	6,751	12,152
				2	.....	43.36	48.35	8.29	3.81	5.22	73.52	1.76	7.40	.....	7,399	13,318
				3	.....	47.28	52.72	.....	4.15	5.69	80.17	1.92	8.07	.....	8,068	14,522
CHRISTIAN COUNTY.																
Empire, ¾ mile west of; Empire mine, Empire bed (face of main south entry, 3,000 feet from shaft bottom).	.....	19293	A	1	11.18	34.48	52.70	1.64	.84	.....	.....	.....	.....	6.6	7,056	12,701
Same (face of 8 west entry, south entry, 3,000 feet from shaft bottom).	.....	19294	A	1	10.79	35.46	50.67	3.08	1.48	.....	.....	.....	.....	5.7	6,963	12,533
Same (face of 1 north entry, 6 west entry, 3,500 feet from shaft bottom).	.....	19295	A	1	9.59	37.02	47.19	6.20	2.60	.....	.....	.....	.....	5.5	6,841	12,314
Same (face of main 6 west entry, 4,060 feet from shaft bottom)	.....	19296	A	1	11.24	35.77	48.55	4.44	2.12	.....	.....	.....	.....	6.9	6,789	12,220
Same (composite of samples 19293, 19294, 19295, and 19296)	.....	19297	A	1	10.79	35.72	49.68	3.81	1.75	5.85	70.02	1.65	16.92	6.2	6,898	12,416
				2	.....	40.04	55.69	4.27	1.96	5.21	78.49	1.85	8.22	.....	7,733	13,919
				3	.....	41.83	58.17	.....	2.05	5.44	81.99	1.93	8.59	.....	8,078	14,540
CRITTENDEN COUNTY.																
Sullivan, 3 miles west of; Barnaby mine (200 feet east of opening)	.....	22894	B	1	4.42	36.77	51.12	7.69	3.43	.....	.....	.....	.....	2.5	7,381	13,286
				2	.....	38.47	53.48	8.05	3.59	.....	.....	.....	.....	.....	7,722	13,900
				3	.....	41.84	58.16	.....	3.90	.....	.....	.....	.....	.....	8,398	15,116
3 miles east of; Newcome mine (500 feet northeast from opening)	.....	22895	B	1	4.38	35.88	52.94	6.80	3.43	.....	.....	.....	.....	2.2	7,466	13,439
				2	.....	37.52	55.37	7.11	3.59	.....	.....	.....	.....	.....	7,808	14,054
				3	.....	40.39	59.61	.....	3.86	.....	.....	.....	.....	.....	8,405	15,129
DAVIESS COUNTY.																
Owensboro, 3 miles northwest of; Fulkerson mine, No. 9 bed (2 room, main entry, 800 feet from mouth of slope).	.....	18970	A	1	10.94	36.86	40.77	11.43	3.87	.....	.....	.....	.....	3.5	6,064	10,915

Same (1 room, main entry, 800 feet from mouth of slope)		18971	A	1	12.38	36.48	41.04	10.10	3.74					5.1	6,069	10,924
Same (composite of samples 18970 and 18971)		18972	A	1	11.57	36.47	41.20	10.76	3.81	5.40	60.24	1.40	18.39	4.3	6,054	10,897
				2		41.24	46.59	12.17	4.31	4.65	68.12	1.58	9.17		6,846	12,323
				3		46.96	53.04		4.91	5.29	77.56	1.80	10.44		7,795	14,031
3 miles west of, George Rudy mine, No. 9 bed (face of 6 north entry, 2,000 feet from shaft bottom).		18958	A	1	12.08	36.61	42.74	8.57	2.80					3.5	6,289	11,320
Same (face of 15 room, 5 north entry, 2,200 feet from shaft bottom)		18959	A	1	11.45	36.60	41.67	10.28	2.96					3.4	6,166	11,099
Same (face of main west entry, 1,800 feet from shaft bottom)		18960	A	1	12.09	35.80	42.50	9.61	3.84					3.9	6,151	11,071
Same (composite of samples 18958, 18959, and 18960)		18961	A	1	11.84	36.79	41.99	9.38	3.25	5.48	62.11	1.37	18.41	3.6	6,195	11,151
				2		41.73	47.63	10.64	3.69	4.72	70.45	1.55	8.95		7,027	12,649
				3		46.70	53.30		4.13	5.28	78.84	1.73	10.02		7,864	14,155
HARLAN COUNTY.																
Benham; Benham mine, "C" or Kellioka bed (face of 3 right entry, 1 left entry, face heading).		24834	A	1	2.64	36.83	58.45	2.08	.53					.8	8,102	14,584
Same (face of 3 room, 2 right entry, 2 left entry, face heading)		24835	A	1	2.59	37.25	58.37	1.79	.51					.6	8,124	14,623
Same (face of 8 room, 1 left entry, 2 right entry, face heading)		24836	A	1	2.74	36.99	58.12	2.15	.48					.8	8,093	14,567
Same (face of 7 room, 3 left entry, 1 right entry, face heading)		24837	A	1	2.60	37.80	56.74	2.86	.32					.7	8,047	14,485
Same (composite of samples 24834, 24835, 24836, and 24837)		24838	A	1	2.50	37.52	57.63	2.35	.52	5.56	80.94	1.52	9.11	.7	8,105	14,589
				2		38.48	59.11	2.41	.53	5.42	83.01	1.56	7.07		8,312	14,962
				3		39.43	60.57		.54	5.55	85.06	1.60	7.25		8,517	15,331
Harlan, 2 miles east of; Clover Fork mine, Harlan bed (25 pillar, 7 left entry).		24728	A	1	2.02	39.25	55.63	3.10	.78					.4	7,986	14,375
				2		40.06	56.78	3.16	.80						8,151	14,672
				3		41.37	58.63		.83						8,417	15,151
Same (face of 7 left air course)		24729	A	1	3.83	37.11	56.56	2.50	.67					2.1	7,900	14,220
Same (face of 9 left entry)		24730	A	1	3.40	37.41	56.49	2.70	.82					1.7	7,912	14,242
Same (face of 7 right entry)		24731	A	1	3.35	37.46	56.19	3.00	.61					1.7	7,878	14,180
Same (composite of samples 24729, 24730, and 24731)		24732	A	1	3.56	37.18	56.55	2.71	.70	5.54	79.61	1.61	9.83	1.8	7,900	14,220
				2		38.55	58.64	2.81	.73	5.33	82.55	1.67	6.91		8,192	14,746
				3		39.66	60.34		.75	5.48	84.94	1.72	7.11		8,429	15,172
4 miles east of; Coxton mine, Harlan bed (face of 22 room, 1 right entry).		24713	A	1	3.68	36.42	56.23	3.67	1.30					2.0	7,814	14,065
Same (face of 17 room, 4 right entry)		24714	A	1	2.76	37.95	55.79	3.50	.83					1.5	7,882	14,188
Same (face of 5 left entry)		24715	A	1	3.04	37.02	56.60	3.34	.87					1.8	7,868	14,162
Same (face of 2 room, 3 left entry)		24716	A	1	3.03	36.91	57.10	2.96	.70					1.3	7,932	14,278
Same (composite of samples 24713, 24714, 24715, and 24716)		24717	A	1	3.18	37.21	56.30	3.31	.93	5.48	78.91	1.67	9.70	1.6	7,859	14,146
				2		38.43	58.15	3.42	.96	5.30	81.50	1.72	7.10		8,117	14,611
				3		39.79	60.21		.99	5.49	84.39	1.78	7.35		8,404	15,127
1 mile east of; Gaston mine, Harlan bed (face of 4 right entry)		24633	A	1	3.22	37.52	56.36	2.90	.52					1.6	7,910	14,238
Same (face of main haulageway)		24634	A	1	3.03	37.94	56.47	2.56	.60					1.4	7,962	14,332
Same (composite of samples 24633 and 24634)		24635	A	1	3.29	37.86	56.17	2.68	.57	5.59	79.63	1.68	9.85	1.5	7,950	14,310
				2		39.15	58.08	2.77	.59	5.40	82.34	1.74	7.16		8,220	14,796
				3		40.27	59.73		.61	5.55	84.69	1.79	7.36		8,454	15,217
3 miles east of; Wood mine, Harlan bed (face of 5 right entry)		24770	A	1	3.13	35.66	55.47	5.74	1.35					1.1	7,616	13,709
				2		36.81	57.26	5.93	1.39						7,862	14,152
				3		39.13	60.87		1.48						8,357	15,043
Same (face of 3 right air course)		24771	A	1	3.90	35.98	55.92	4.20	.61					1.7	7,735	13,923
Same (face of 4 right entry)		24772	A	1	3.44	36.18	54.80	5.58	.71					1.5	7,631	13,736
Same (composite of samples 24771 and 24772)		24773	A	1	3.59	35.99	55.45	4.97	.70	5.43	77.82	1.59	9.49	1.6	7,679	13,822
				2		37.33	57.52	5.15	.73	5.22	80.71	1.65	6.54		7,965	14,337
				3		39.36	60.64		.77	5.50	85.09	1.74	6.90		8,397	15,115

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
KENTUCKY—Continued.																
HENDERSON COUNTY.																
Baskett; No. 1 mine, No. 9 bed (face of main south entry, 3,000 feet from shaft).	.....	18962	A	1	12.21	35.56	42.36	9.87	2.91	.....	.....	.....	.....	3.9	6,182	11,128
Same (face of 1 west entry, main south entry, 1,400 feet from shaft).	.....	18963	A	1	10.12	35.71	42.82	11.35	2.87	.....	.....	.....	.....	2.0	6,232	11,219
Same (face of 29 room, 2 east south entry, 3,500 feet from shaft)	.....	18964	A	1	10.36	37.29	42.73	9.62	2.61	.....	.....	.....	.....	2.4	6,334	11,401
Same (face of main north entry, 2,600 feet from shaft)	.....	18965	A	1	11.38	36.75	42.45	9.42	3.53	.....	.....	.....	.....	3.9	6,273	11,291
Same (composite of samples 18962, 18963, 18964, and 18965)	.....	18966	A	1	11.05	36.32	42.59	10.04	3.08	5.51	62.60	1.35	17.42	3.0	6,257	11,263
				2	.....	40.83	47.88	11.29	3.46	4.81	70.37	1.52	8.55	.....	7,304	12,661
				3	.....	46.03	53.97	.....	3.90	5.42	79.33	1.71	9.64	.....	7,929	14,272
Corydon; Corydon mine, No. 12 bed (face of 8 room, 2 south entry, 1,000 feet from shaft).	.....	19103	A	1	12.13	35.34	41.09	11.44	3.28	.....	.....	.....	.....	5.4	5,969	10,744
Same (face of 8 room, 2 north entry, 1,000 feet from shaft)	.....	19104	A	1	11.82	34.22	41.24	12.72	3.05	.....	.....	.....	.....	6.5	5,922	10,660
Same (face of 1 north entry, 800 feet from shaft)	.....	19105	A	1	10.88	36.45	42.92	9.75	2.58	.....	.....	.....	.....	4.8	6,204	11,167
Same (face of 2 south entry, 1,000 feet from shaft)	.....	19106	A	1	10.72	35.51	42.61	11.16	3.08	.....	.....	.....	.....	5.0	6,114	11,005
Same (composite of samples 19103, 19104, 19105, and 19106)	.....	19107	A	1	11.28	35.72	41.61	11.39	2.94	5.33	60.83	1.39	18.12	5.4	6,054	10,897
				2	.....	40.26	46.90	12.84	3.31	4.60	68.55	1.57	9.13	.....	6,823	12,281
				3	.....	46.19	53.81	.....	3.80	5.28	78.65	1.80	10.47	.....	7,828	14,090
Henderson, 1¼ miles south of; Nicholson mine, No. 9 bed (4 room, 2 west entry, 1,250 feet from shaft).	.....	18973	A	1	11.27	36.56	41.51	10.66	2.87	.....	.....	.....	.....	4.9	6,176	11,117
Same (face of 1 west entry, 1,200 feet from shaft)	.....	18974	A	1	11.77	36.45	40.66	11.12	3.42	.....	.....	.....	.....	5.1	6,089	10,960
Same (composite of samples 18973 and 18974)	.....	18975	A	1	11.55	36.15	41.49	10.81	3.18	5.41	61.30	1.41	17.89	5.0	6,132	11,038
				2	.....	40.87	46.91	12.22	2.60	4.67	69.31	1.59	8.61	.....	6,933	12,479
				3	.....	46.56	53.44	.....	4.10	5.32	78.96	1.81	9.81	.....	7,898	14,216
Robards, ¾ mile south of; Panama mine, No. 9 bed (face of 27 room, 3 south entry, 1,800 feet from shaft).	.....	18976	A	1	9.90	36.53	43.77	9.80	3.35	.....	.....	.....	.....	4.3	6,357	11,443
Same (face of 3 north entry, 1,600 feet from shaft)	.....	18977	A	1	9.57	37.56	42.07	10.80	4.08	.....	.....	.....	.....	4.4	6,176	11,117
Same (composite of samples 18976 and 18977)	.....	18978	A	1	9.68	37.01	43.02	10.29	3.76	5.31	62.21	1.42	17.01	4.3	6,255	11,259
				2	.....	40.98	47.63	11.39	4.16	4.68	68.88	1.57	9.32	.....	6,929	12,467

			3	.....	46.25	53.75	.....	4.69	5.28	77.73	1.77	10.53	.....	7,816	14,069
Smith Mills; Smith Mills mine, No. 12 bed (face of 12 room, 4 north entry, 1,200 feet from shaft).	.....	19108	A	1	13.30	32.48	44.73	9.49	2.02	.....	.....	.....	4.9	6,038	10,868
Same (face of 11 room, 3 north entry, 1,100 feet from shaft)	.....	19109	A	1	12.60	32.89	46.11	8.40	1.77	.....	.....	.....	6.5	6,206	11,171
Same (face of 4 room, west entry, 1,200 feet from shaft)	.....	19110	A	1	13.35	34.06	45.02	7.57	1.69	.....	.....	.....	5.4	6,244	11,239
Same (face of 5 room, main north entry, 1,200 feet from shaft)	.....	19111	A	1	12.74	33.02	46.95	7.29	1.56	.....	.....	.....	5.0	6,323	11,381
Same (composite of samples 19108, 19109, 19110, and 19111)	.....	19112	A	1	12.96	33.39	45.40	8.25	1.80	5.47	62.90	1.44	20.14	5.5	6,227	11,209
				2	.....	38.36	52.16	9.48	2.07	4.63	72.27	1.65	9.90	.....	7,154	12,877
				3	.....	42.38	57.62	.....	2.29	5.12	79.85	1.82	10.92	.....	7,904	14,227
HOPKINS COUNTY.																
Dawson Springs, 1 mile north of; J. W. Workman mine, Dawson bed (face of main east entry, 500 feet east of shaft).	.....	19298	A	1	8.95	39.03	47.70	4.32	2.72	.....	.....	.....	5.6	7,053	12,695
Same (face of 3 room, main east entry, 500 feet from shaft)	.....	19299	A	1	8.20	39.22	48.78	3.80	2.25	.....	.....	.....	4.2	7,148	12,866
Same (left rib near face of 2 room, air course, 500 feet from shaft)	.....	19300	A	1	8.99	36.77	47.62	6.62	3.68	.....	.....	.....	4.8	6,864	12,355
Same (right rib at face of 2 room, air course, 500 feet from shaft)	.....	19301	A	1	8.76	37.79	48.15	5.30	2.71	.....	.....	.....	4.6	6,959	12,526
Same (composite of samples 19298, 19299, 19300, and 19301)	.....	19302	A	1	8.84	37.83	48.28	5.05	2.78	5.74	70.34	1.63	14.46	4.8	6,982	12,568
				2	.....	41.50	52.96	5.54	3.05	5.22	77.16	1.79	7.24	.....	7,659	13,786
				3	.....	43.93	56.07	.....	3.23	5.53	81.68	1.89	7.67	.....	8,108	14,594
Earlington, ½ mile southeast of; No. 9 mine, No. 9 bed (face of main north entry, 4,000 feet from entrance).	.....	19204	A	1	8.51	35.67	45.85	9.97	3.99	.....	.....	.....	4.7	6,526	11,747
Same (face of 100 room, 7 east entry, 8,000 feet from entrance)	.....	19205	A	1	8.43	37.12	46.65	7.80	3.76	.....	.....	.....	4.6	6,707	12,073
Same (rib of 16 east entry, opposite 37 room, 5,000 feet from entrance).	.....	19206	A	1	8.65	36.56	45.61	9.18	3.24	.....	.....	.....	4.7	6,585	11,853
Same (face of 39 room, 13 east entry, 5,000 feet from entrance)	.....	19207	A	1	8.66	36.23	45.50	9.61	3.57	.....	.....	.....	4.8	6,557	11,803
Same (rib of 92 room, 7 east entry, 7,500 feet from entrance)	.....	19208	A	1	8.05	37.07	45.67	9.21	3.38	.....	.....	.....	4.4	6,623	11,921
Same (rib of 10 east entry, 65 room, 8,000 feet from entrance)	.....	19209	A	1	8.67	36.49	44.53	10.31	3.05	.....	.....	.....	5.0	6,504	11,707
Same (face of 14 east entry, 5,000 feet from entrance)	.....	19210	A	1	8.36	36.91	46.07	8.66	3.83	.....	.....	.....	4.7	6,657	11,983
Same (face of 62 room, 60 feet from 10 east entry, 5,000 feet from entrance).	.....	19211	A	1	9.45	36.39	45.63	8.53	2.82	.....	.....	.....	5.2	6,579	11,842
Same (composite of samples 19204, 19205, 19206, 19207, 19208, 19209, 19210, and 19211).	.....	19212	A	1	8.54	36.36	45.89	9.21	3.48	5.42	65.94	1.40	14.55	4.8	6,602	11,884
				2	.....	39.76	50.17	10.07	3.81	4.89	72.10	1.53	7.60	.....	7,219	12,994
				3	.....	44.21	55.79	.....	4.24	5.44	80.18	1.70	8.44	.....	8,028	14,450
Madisonville, 1 mile west of; Reinecke mine, No. 11 bed (face of 8 west entry, main north entry, 1¾ miles from shaft).	.....	19194	A	1	6.53	39.68	46.42	7.37	3.75	.....	.....	.....	3.3	6,943	12,497
Same (face of 10 west entry, 1¾ miles from shaft)	.....	19195	A	1	6.34	39.86	45.69	8.11	3.73	.....	.....	.....	3.2	6,884	12,391
Same (face of 15 room, 5 west entry, 1½ miles from shaft)	.....	19196	A	1	5.92	41.02	45.30	7.76	3.43	.....	.....	.....	2.7	6,970	12,546
Same (face of main north entry, 1¼ miles from shaft)	.....	19197	A	1	5.43	40.25	47.63	6.69	3.45	.....	.....	.....	2.3	7,087	12,757
Same (face of 12 west entry, at junction of 1 south entry, 1¼ miles from shaft).	.....	19198	A	1	6.53	39.13	45.24	9.10	4.17	.....	.....	.....	3.0	6,761	12,170
Same (1 room, 16 east entry, main south entry, 2 miles from shaft).	.....	19199	A	1	7.15	39.85	47.56	5.44	3.32	.....	.....	.....	3.5	7,040	12,672
Same (face of 8 room, 16 east air course, 1¾ miles southeast of shaft).	.....	19200	A	1	6.04	40.68	47.23	6.05	3.44	.....	.....	.....	2.9	7,086	12,755
Same (rib of 6 west entry, opposite 8 room, 1½ miles from shaft)	.....	19201	A	1	6.32	39.87	47.02	6.79	3.83	.....	.....	.....	2.9	6,996	12,593
Same (face of 14 west entry, 20 room, 2 miles southwest of shaft	.....	19202	A	1	6.94	38.31	45.11	9.64	4.54	.....	.....	.....	3.9	6,685	12,033
Same (composite of samples of 19194, 19195, 19196, 19197, 19198, 19199, 19200, 19201, and 19202).	.....	19203	A	1	6.22	39.89	46.40	7.49	3.70	5.45	69.23	1.31	12.82	3.1	6,931	12,476
				2	.....	42.53	49.48	7.99	3.95	5.08	73.82	1.40	7.76	.....	7,391	13,304
				3	.....	46.22	53.78	.....	4.29	5.52	80.23	1.52	8.44	.....	8,033	14,459

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
KENTUCKY—Continued.																
HOPKINS COUNTY—continued.																
Nebo, 3 miles south of; Nebo mine, No. 14 bed (last cut-through, 2 east entry, north entry, 3,000 feet from entrance).	.....	19230	A	1	9.41	35.32	43.24	12.03	3.73	.....	.....	.....	.....	6.0	6,218	11,192
Same (face of 15 room, 1 east entry, 3,000 feet from entrance)	.....	19231	A	1	8.48	35.21	48.42	7.89	2.64	.....	.....	.....	.....	4.1	6,659	11,986
Same (rib of 5 room, 1 north entry, 3,000 feet from entrance)	.....	19232	A	1	7.73	36.78	49.15	6.34	2.24	.....	.....	.....	.....	3.2	6,854	12,337
Same (face of 2 room, 3 east entry, north entry, 3,200 feet from entrance).	.....	19233	A	1	9.11	34.09	47.20	9.60	3.12	.....	.....	.....	.....	5.1	6,535	11,763
Same (face of 1 west entry, 1 north entry, 3,400 feet from entrance).	.....	19234	A	1	8.81	35.47	47.56	8.16	2.54	.....	.....	.....	.....	4.1	6,635	11,943
Same (2 east break-through, 40 feet from intersection of 4 east and north entries, 3,600 feet from entrance).	.....	19235	A	1	9.69	35.84	48.37	6.10	2.20	.....	.....	.....	.....	5.4	6,704	12,067
Same (composite of samples 19230, 19231, 19232, 19233, 19234, and 19235).	.....	19236	A	1	8.85	35.29	47.51	8.35	2.79	5.40	67.21	1.53	14.72	4.7	6,623	11,921
				2	.....	38.72	52.12	9.16	3.06	4.85	73.74	1.68	7.51	.....	7,266	13,079
				3	.....	42.62	57.38	.....	3.37	5.34	81.17	1.85	8.27	.....	7,998	14,396
Nortonville, 1,000 feet west of; Norton No. 1 mine, No. 11 bed (face of 23 room, 1 west back heading, 2,500 feet from shaft).	.....	19237	A	1	7.38	39.42	45.90	7.30	3.68	.....	.....	.....	.....	3.6	6,819	12,274
Same (face of 27 room, 2 east entry, 2,500 feet from shaft)	.....	19238	A	1	8.36	38.36	46.28	7.00	3.30	.....	.....	.....	.....	4.5	6,782	12,208
Same (face of 23 room, 2 west entry, 3,000 feet from shaft)	.....	19239	A	1	7.59	37.98	46.52	7.91	3.90	.....	.....	.....	.....	4.0	6,728	12,110
Same (face of 2 east entry air course, 3,000 feet east of shaft)	.....	19240	A	1	7.67	39.13	46.71	6.49	3.41	.....	.....	.....	.....	4.3	6,878	12,380
Same (face of 25 room, 1 west entry, 2,500 feet west of shaft)	.....	19241	A	1	7.92	39.22	46.79	6.07	3.10	.....	.....	.....	.....	3.5	6,886	12,395
Same (face of 2 west entry, 3,000 feet west of shaft)	.....	19242	A	1	7.83	38.64	46.92	6.61	3.48	.....	.....	.....	.....	3.4	6,843	12,317
Same (composite of samples 19237, 19238, 19239, 19240, 19241, and 19242).	.....	19243	A	1	7.87	38.89	46.27	6.97	3.54	5.54	68.51	1.25	14.19	3.9	6,824	12,283
				2	.....	42.21	50.22	7.57	3.84	5.07	74.36	1.36	7.80	.....	7,407	13,333
				3	.....	45.67	54.33	.....	4.15	5.49	80.45	1.47	8.44	.....	8,014	14,425
St. Charles, 2 miles northwest of; Carbondale No. 1 mine, No. 9 bed (face of 7 west entry, 6 north entry, 4,500 feet from entrance).	.....	19261	A	1	8.85	37.72	45.96	7.47	2.47	.....	.....	.....	.....	6.1	6,676	12,017
Same (face of 3 main north entry, 2,000 feet from entrance)	.....	19262	A	1	9.53	36.47	46.17	7.83	3.06	.....	.....	.....	.....	6.6	6,568	11,822
Same (neck of 12 room, 6 east entry, 3 north entry, 2,000 feet from entrance).	.....	19263	A	1	8.21	37.49	44.42	9.88	3.71	.....	.....	.....	.....	5.4	6,451	11,612
Same (face of 3 east entry, 3 north entry, 3,000 feet from entrance)	.....	19264	A	1	10.05	36.43	46.43	7.09	3.18	.....	.....	.....	.....	6.8	6,613	11,903

Same (face of 22 room, 3 east entry, 3 north entry, 3,000 feet from entrance).	.....	19265	A	1	8.52	37.29	45.70	8.49	3.65	.....	.....	.....	.....	5.4	6,622	11,920
Same (face of 9 room, 5 east entry, 5 north entry, 5,000 feet from entrance).	.....	19266	A	1	8.49	37.27	45.52	8.72	3.55	.....	.....	.....	.....	5.5	6,585	11,853
Same (composite of samples 19261, 19262, 19263, 19264, 19265, and 19266).	.....	19267	A	1	8.95	37.02	45.75	8.28	3.29	5.53	66.09	1.43	15.38	6.0	6,594	11,869
				2	.....	40.66	50.25	9.09	3.61	4.99	72.59	1.57	8.15	.....	7,242	13,036
				3	.....	44.73	55.27	.....	3.97	5.49	79.85	1.73	8.96	.....	7,966	14,339
2 miles northeast of; Fox Run mine, No. 9 bed (face of 40 room, 10 east entry, 3,500 feet from entrance).	.....	19252	A	1	8.64	37.33	45.34	8.69	3.20	.....	.....	.....	.....	3.2	6,600	11,880
Same (face of 11 room, 12 east entry, 3,000 feet from entrance)	.....	19253	A	1	8.89	37.93	45.67	7.51	2.19	.....	.....	.....	.....	3.3	6,678	12,020
Same (face of 9 west entry, 3,500 feet from entrance)	.....	19254	A	1	9.61	37.22	45.93	7.24	2.80	.....	.....	.....	.....	3.9	6,675	12,015
Same (face of 7 west entry, 3,500 feet from entrance)	.....	19255	A	1	7.82	37.78	45.70	8.70	3.78	.....	.....	.....	.....	3.4	6,626	11,927
Same (rib of 35 room, 10 east entry, 3,500 feet southeast of entrance).	.....	19256	A	1	8.47	37.54	44.41	9.58	3.55	.....	.....	.....	.....	3.3	6,516	11,729
Same (rib of 9 room, 13 east entry, 3,000 feet from entrance)	.....	19257	A	1	8.47	34.76	43.24	13.53	2.64	.....	.....	.....	.....	5.4	6,214	11,185
Same (face of 15 east entry, 3,000 feet from entrance)	.....	19258	A	1	8.52	37.16	46.37	7.95	3.22	.....	.....	.....	.....	5.2	6,677	12,019
Same (face of 2 room, 7 west entry, 3,000 feet from entrance)	.....	19259	A	1	8.52	37.25	44.06	10.17	3.70	.....	.....	.....	.....	5.4	6,476	11,657
Same (composite of samples 19252, 19253, 19254, 19255, 19256, 19257, 19258, and 19259).	.....	19260	A	1	8.61	37.02	45.01	9.36	3.13	5.46	65.45	1.38	15.22	4.1	6,567	11,821
				2	.....	40.51	49.25	10.24	3.42	4.92	71.62	1.51	8.29	.....	7,186	12,935
				3	.....	45.13	54.87	.....	3.81	5.48	79.79	1.68	9.24	.....	8,005	14,409
KNOX COUNTY.																
Bradel, Bennett No. 1 mine, Dean bed (face of main entry, 2,400 feet from mine opening).	.....	21537	A	1	4.62	35.87	53.28	6.23	.74	.....	.....	.....	.....	2.6	7,408	13,334
Same (face of 4 left entry, 2,000 feet from mine opening)	.....	21538	A	1	4.30	36.32	53.62	5.76	.76	.....	.....	.....	.....	2.4	7,450	13,410
Same (face of 5 left entry, 2,500 feet from mine opening)	.....	21539	A	1	4.24	37.09	53.15	5.52	.77	.....	.....	.....	.....	2.3	7,486	13,475
Same (face of 2 right entry, 2,000 feet from mine opening)	.....	21540	A	1	3.77	37.15	52.38	6.70	.72	.....	.....	.....	.....	1.9	7,418	13,352
Same (composite of samples 21537, 21538, 21539, and 21540)	.....	21541	A	1	4.21	36.44	53.30	6.05	.77	5.56	74.84	1.73	11.05	2.3	7,449	13,408
				2	.....	38.04	55.65	6.31	.80	5.31	78.13	1.81	7.64	.....	7,777	13,999
				3	.....	40.00	59.40	.....	.85	5.67	83.39	1.93	8.16	.....	8,300	14,940
Elys, ½ mile northeast of; New Hughes mine, Jellico bed (5 room, butt entry, 1 mile from mine opening).	.....	21542	A	1	3.96	34.82	54.78	6.44	1.51	.....	.....	.....	.....	2.1	7,437	13,387
Same (face of main left entry, 1 mile from mine opening)	.....	21543	A	1	5.08	36.52	52.96	5.44	1.68	.....	.....	.....	.....	3.3	7,415	13,347
Same (face of main right entry, 3,000 feet from mine opening)	.....	21544	A	1	4.99	34.90	52.76	7.35	1.51	.....	.....	.....	.....	3.2	7,291	13,124
Same (face of 2 left entry, Sandy branch entry, 3,000 feet from mine opening).	.....	21545	A	1	3.98	34.80	54.01	7.21	1.25	.....	.....	.....	.....	2.1	7,351	13,232
Same (composite of samples 21542, 21543, 21544, and 21545)	.....	21546	A	1	4.49	35.60	53.26	6.65	1.42	5.51	74.29	1.70	10.43	2.7	7,394	13,309
				2	.....	37.27	55.77	6.96	1.49	5.25	77.78	1.78	6.74	.....	7,742	13,936
				3	.....	40.06	59.94	.....	1.60	5.64	83.60	1.91	7.25	.....	8,321	14,978
LAUREL COUNTY.																
East Barnstead, 1½ miles northeast of; Bonar mine, No. 1 bed (face of main entry, 2,000 feet from mine opening).	.....	21429	A	1	4.03	41.40	47.88	6.69	3.76	.....	.....	.....	.....	2.2	7,387	13,297
Same (face of 3 right entry, 1,800 feet from mine opening)	.....	21430	A	1	4.74	38.58	52.72	3.96	1.37	.....	.....	.....	.....	2.4	7,571	13,628
Same (face of 2 right entry, 1,700 feet from mine opening)	.....	21431	A	1	4.89	38.48	53.98	2.65	1.09	.....	.....	.....	.....	2.4	7,657	13,783
Same (face of 1 right entry, 1,500 feet from mine opening)	.....	21432	A	1	4.62	40.43	49.28	5.67	2.96	.....	.....	.....	.....	2.6	7,437	13,387
Same (composite of samples 21429, 21430, 21431, and 21432)	.....	21433	A	1	4.53	39.87	50.80	4.80	2.30	5.65	74.58	1.80	10.87	2.4	7,506	13,511
				2	.....	41.76	53.21	5.03	2.41	5.39	78.12	1.89	7.16	.....	7,862	14,152
				3	.....	43.97	56.03	.....	2.54	5.68	82.26	1.99	7.35	.....	8,279	14,902
Pittsburgh, 1½ miles east of; Acme mine, No. 1 bed (face of 1 left entry, 1,900 feet from mine opening).	.....	21339	A	1	3.24	41.57	46.27	8.92	4.66	.....	.....	.....	.....	1.6	7,263	13,073
Same (face of main entry, 2,000 feet from mine opening)	.....	21340	A	1	3.98	39.03	49.12	7.87	3.53	.....	.....	.....	.....	2.0	7,309	13,156

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
KENTUCKY—Continued.																
LAUREL COUNTY—continued.																
Pittsburgh, 1½ miles east of; Acme mine, No. 1 bed (face of 3 right entry, 1,800 feet from mine opening).	.....	21341	A	1	3.74	39.54	50.64	6.08	3.03	.....	.....	.....	.....	1.9	7,467	13,441
Same (face of 2 right entry, 1,600 feet from mine opening)	.....	21342	A	1	4.18	39.34	50.90	5.58	3.03	.....	.....	.....	.....	2.0	7,474	13,453
Same (composite of samples 21339, 21340, 21341, and 21342)	.....	21343	A	1	3.80	39.83	49.23	7.14	3.58	5.57	73.05	1.85	8.81	1.9	7,373	13,271
				2	.....	41.40	51.18	7.42	3.72	5.35	75.94	1.92	5.65	.....	7,664	13,795
				3	.....	44.72	55.28	.....	4.02	5.78	82.02	2.07	6.11	.....	8,278	14,900
LETCHER COUNTY.																
Fleming, near; Elkhorn No. 301 mine, Elkhorn bed (face of 4 room, 2 left heading, 1,300 feet from opening).	.....	21308	A	1	2.86	37.32	55.89	3.93	.70	.....	.....	.....	.....	1.2	7,814	14,065
Same (face of main right heading, 1,900 feet from opening)	.....	21309	A	1	3.69	36.81	55.59	3.91	.59	.....	.....	.....	.....	2.1	7,770	13,986
Same (face of 17 room, gap entry, 1,800 feet from opening)	.....	21310	A	1	3.61	36.05	56.37	3.97	.60	.....	.....	.....	.....	2.0	7,771	13,988
Same (face of gap entry, 1,900 feet from opening)	.....	21311	A	1	4.38	35.58	55.76	4.28	.58	.....	.....	.....	.....	2.8	7,672	13,810
Same (composite of samples 21308, 21309, 21310, and 21311)	.....	21312	A	1	3.64	36.75	55.54	4.07	.64	5.52	78.81	1.58	9.38	2.0	7,751	13,952
				2	.....	38.14	57.64	4.22	.66	5.31	81.79	1.64	6.38	.....	8,044	14,479
				3	.....	39.82	60.18	.....	.69	5.54	85.40	1.71	6.66	.....	8,399	15,118
McRoberts; Consolidation No. 213 mine, Elkhorn bed (face of 1 right entry, 1 left face heading).	.....	21294	A	1	3.26	36.82	56.59	3.33	.58	.....	.....	.....	.....	1.9	7,840	14,112
Same (face of main entry)	.....	21295	A	1	2.06	37.40	57.56	2.98	.58	.....	.....	.....	.....	.7	7,979	14,362
Same (face of 1 left entry, 1 right face entry)	.....	21296	A	1	2.91	36.11	57.23	3.75	.49	.....	.....	.....	.....	1.3	7,840	14,112
Same (face of 1 right face heading)	.....	21297	A	1	3.42	35.82	57.53	3.23	.53	.....	.....	.....	.....	2.0	7,822	14,080
Same (composite of samples 21294, 21295, 21296, and 21297)	.....	21298	A	1	2.91	36.33	57.53	3.23	.55	5.65	79.86	1.59	9.12	1.5	7,872	14,170
				2	.....	37.42	59.25	3.33	.57	5.49	82.26	1.64	6.71	.....	8,108	14,594
				3	.....	38.71	61.29	.....	.59	5.68	85.09	1.70	6.94	.....	8,387	15,097
Consolidation No. 214 mine, Elkhorn bed (face of 2 right heading, 2,900 feet from opening).	.....	21299	A	1	3.08	36.98	57.00	2.94	.51	.....	.....	.....	.....	2.1	7,919	14,254
Same (face of 1 left entry, 1 right face entry, 2,400 feet from opening).	.....	21300	A	1	3.11	37.08	55.68	4.13	.62	.....	.....	.....	.....	1.8	7,807	14,053
Same (face of 1 right face heading, 1,900 feet from opening)	.....	21301	A	1	3.37	37.06	55.70	3.87	.60	.....	.....	.....	.....	2.1	7,788	14,018

Same (face of 2 left entry, 1 left face entry, 2,750 feet from opening).	21317	A	1	3.06	36.97	56.23	3.74	.58					1.7	7,858	14,144
Same (composite of samples 21299, 21300, 21301, and 21317)	21302	A	1	3.20	36.76	56.41	3.63	.60	5.57	79.44	1.59	9.17	1.9	7,828	14,090
			2		37.98	58.27	3.75	.62	5.38	82.07	1.64	6.54		8,087	14,557
			3		39.46	60.54		.64	5.59	85.27	1.70	6.80		8,402	15,124
Mater; Elkhorn or Kona mine, Elkhorn bed (face of 1 main entry, 750 feet from opening).	21305	A	1	2.68	37.56	55.77	3.99	.90					1.0	7,837	14,107
			2		38.59	57.31	4.10	.92						8,053	14,495
			3		40.24	59.76		.96						8,398	15,116
Same (face of 1 left entry, 2 main entry, 450 feet from opening)	21303	A	1	3.80	36.45	55.41	4.34	.96					2.5	7,696	13,853
Same (face of 2 right entry, 1 main entry, 500 feet from opening)	21304	A	1	3.91	36.70	55.72	3.67	.95					2.6	7,758	13,964
Same (face of 2 main entry, 600 feet from opening)	21306	A	1	3.48	37.38	55.08	4.06	1.13					2.1	7,754	13,957
Same (composite of samples 21303, 21304, and 21306)	21307	A	1	3.80	36.74	55.44	4.02	1.03	5.64	77.99	1.54	9.78	2.4	7,717	13,891
			2		38.19	57.63	4.18	1.07	5.43	81.07	1.60	6.65		8,022	14,440
			3		39.86	60.14		1.12	5.67	84.60	1.67	6.94		8,372	15,070
M'LEAN COUNTY.															
Island; O'Neil mine, No. 9 bed (face of 4 room, 3 south entry, 600 feet from shaft).	19281	A	1	9.36	37.31	43.37	9.96	3.44					5.4	6,466	11,639
Same (face of main west entry, 750 feet from shaft)	19282	A	1	9.62	39.14	42.87	8.37	2.71					6.2	6,582	11,848
Same (face of 6 room, 2 south entry, 400 feet southwest of shaft)	19283	A	1	9.26	38.45	43.14	9.15	2.72					5.1	6,545	11,781
Same (face of 6 room, 1 south entry, 400 feet southwest of shaft)	19284	A	1	8.58	38.14	42.17	11.11	3.75					4.7	6,464	11,635
Same (composite of samples 19281, 19282, 19283, and 19284)	19285	A	1	9.25	38.03	43.01	9.71	3.14	5.60	65.02	1.34	15.19	5.4	6,521	11,738
			2		41.91	47.39	10.70	3.46	5.04	71.65	1.48	7.67		7,185	12,933
			3		46.93	53.07		3.87	5.64	80.23	1.66	8.60		8,046	14,483
MUHLENBURG COUNTY.															
Bevier; Lam mine, No. 9 bed (rib of 21 room, 2 west entry, 1 south entry, 4,000 feet from entrance).	19331	A	1	8.76	37.38	44.17	9.69	4.35					3.8	6,539	11,770
Same (face of 3 east blind entry, 4,000 feet from entrance)	19332	A	1	8.15	36.82	45.50	9.53	3.68					4.0	6,587	11,857
Same (rib of 22 room, 4 east entry, 1 south entry, 4,000 feet from entrance).	19333	A	1	9.13	37.53	45.07	8.27	3.06					5.3	6,623	11,921
Same (last break-through at face of 3 west entry, 1 south entry, 2 west entry, 2,500 feet from entrance).	19334	A	1	9.02	37.49	45.83	7.66	3.29					4.7	6,684	12,031
Same (face of 2 south entry, 4 east entry, 3,500 feet from entrance)	19335	A	1	8.93	38.11	44.13	8.83	3.52					5.0	6,570	11,826
Same (break-through opposite 61 room, 2 east entry, 3,500 feet from entrance).	19336	A	1	9.58	36.21	45.15	9.06	3.26					4.9	6,535	11,763
Same (composite of samples 19331, 19332, 19333, 19334, 19335, and 19336).	19337	A	1	8.82	37.29	45.09	8.80	3.52	5.52	66.08	1.42	14.66	4.6	6,595	11,871
			2		40.90	49.45	9.65	3.86	4.98	72.47	1.56	7.48		7,233	13,019
			3		45.27	54.73		4.27	5.51	80.21	1.73	8.28		8,005	14,409
OHIO COUNTY.															
Rockport, ¼ mile northwest of; Crown mine, No. 9 bed (face of 11 room, 6 north entry, main east entry, 1,600 feet from shaft).	19338	A	1	9.65	35.87	45.23	9.25	3.25					5.1	6,504	11,707
Same (face of main east blind entry, 1,800 feet from shaft)	19339	A	1	10.23	35.60	44.72	9.45	2.69					5.3	6,405	11,529
Same (face of 7 south entry, 2,000 feet from shaft)	19340	A	1	9.26	35.69	43.80	11.25	3.76					4.3	6,339	11,410
Same (15 feet from entry in 19 room, 5 south entry, 1,800 feet from shaft).	19341	A	1	9.85	35.26	44.58	10.31	3.78					5.3	6,390	11,502
Same (neck of 46 room, 3 south entry, 2,200 feet from shaft)	19342	A	1	9.02	36.54	46.06	8.38	2.95					4.0	6,629	11,932
Same (intersection of 1 east and 4 north entries, 1,200 feet from shaft).	19343	A	1	9.05	35.63	43.92	11.40	4.05					3.6	6,344	11,419
Same (composite of samples 19338, 19339, 19340, 19341, 19342, and 19343).	19344	A	1	9.48	35.65	44.92	9.95	3.41	5.47	64.72	1.42	15.03	4.6	6,407	11,533
			2		39.38	49.63	10.99	3.77	4.88	71.50	1.57	7.29		7,078	12,740
			3		44.24	55.76		4.24	5.48	80.33	1.76	8.19		7,952	14,314

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
KENTUCKY—Continued.																
PERRY COUNTY.																
Domino; Himyar mine, Haldix, Hazard, or No. 6 bed (face of 2 left entry, 800 feet from drift mouth).	.....	21334	A	1	6.07	35.00	53.01	5.92	0.61	.....	.....	.....	.....	3.6	7,258	13,064
Same (face of 1 right entry, 500 feet from drift mouth)	.....	21335	A	1	4.94	34.19	51.40	9.47	.58	.....	.....	.....	.....	2.8	7,026	12,647
Same (face of 1 left entry, 2 main entry, 550 feet from drift mouth)	.....	21336	A	1	5.09	35.08	52.05	7.87	.66	.....	.....	.....	.....	2.8	7,153	12,875
Same (face of 2 main entry, 700 feet from drift mouth)	.....	21337	A	1	5.50	34.59	50.76	9.15	1.15	.....	.....	.....	.....	3.2	6,982	12,568
Same (composite of samples 21334, 21335, 21336, and 21337)	.....	21338	A	1	5.33	34.88	51.71	8.08	.74	5.36	72.47	1.55	11.80	3.1	7,114	12,805
				2	.....	36.84	54.63	8.53	.78	5.04	76.55	1.64	7.46	.....	7,515	13,527
				3	.....	40.28	59.72	.....	.85	5.51	83.69	1.79	8.16	.....	8,216	14,789
Douglas; Douglas mine, Fire Clay, Dean, or No. 4 bed (face of 4 room, 2 right entry, 500 feet from drift mouth).	.....	21354	A	1	3.75	36.23	56.00	4.02	.66	.....	.....	.....	.....	1.9	7,686	13,835
Same (face of 2 right entry, 600 feet from drift mouth)	.....	21355	A	1	3.61	37.78	55.47	3.14	.86	.....	.....	.....	.....	1.7	7,796	14,033
Same (face of 3 right entry)	.....	21356	A	1	3.29	37.81	56.09	2.81	.65	.....	.....	.....	.....	1.3	7,832	14,098
Same (face of 1 right entry, 800 feet from drift mouth)	.....	21357	A	1	3.84	37.07	55.41	3.68	.67	.....	.....	.....	.....	1.9	7,724	13,903
Same (composite of samples 21354, 21355, 21356, and 21357)	.....	21358	A	1	3.61	37.08	55.93	3.38	.71	5.61	78.78	1.71	9.81	1.7	7,768	15,982
				2	.....	38.47	58.02	3.51	.74	5.41	81.73	1.77	6.84	.....	8,059	14,506
				3	.....	39.87	60.13	.....	.77	5.61	84.70	1.83	7.09	.....	8,352	15,034
Hazard, ½ mile east of; Hazard mine, Fire Clay, Dean, or No. 4 bed (face of 3 west entry, 1,800 feet southwest of drift mouth).	.....	21364	A	1	3.71	37.33	55.87	3.09	.65	.....	.....	.....	.....	1.9	7,756	13,961
Same (face of 1 west entry, 1,200 feet southwest of mine opening)	.....	21365	A	1	3.49	37.50	55.15	3.86	.59	.....	.....	.....	.....	1.5	7,720	13,896
Same (face of 2 right entry, 1,800 feet from mouth of mine)	.....	21366	A	1	3.81	36.81	55.81	3.57	.57	.....	.....	.....	.....	1.8	7,703	13,865
Same (composite of samples 21364, 21365, and 21366)	.....	21367	A	1	3.78	36.90	55.80	3.52	.66	5.56	77.77	1.76	10.73	1.7	7,733	13,919
				2	.....	38.35	57.99	3.66	.69	5.34	80.83	1.83	7.65	.....	8,037	14,467
				3	.....	39.81	60.19	.....	.72	5.54	83.90	1.90	7.94	.....	8,342	15,016
½ mile southwest of; Hazard-Dean mine, Fire Clay, Dean, or No. 4 bed (face of 1 main entry, 900 feet from drift mouth).	.....	21368	A	1	4.46	36.23	55.08	4.23	.87	.....	.....	.....	.....	2.3	7,574	13,633
Same (face of 2 main entry, 500 feet from drift mouth)	.....	21369	A	1	3.57	37.87	54.90	3.66	.78	.....	.....	.....	.....	1.6	7,706	13,871
Same (face of 2 right entry, 900 feet from mouth of mine)	.....	21370	A	1	3.74	36.97	55.21	4.08	.57	.....	.....	.....	.....	1.7	7,658	13,784
Same (face of 2 left entry, 950 feet from mine opening)	.....	21371	A	1	3.93	37.55	54.94	3.58	.68	.....	.....	.....	.....	1.8	7,688	13,838

Same (composite of samples 21368, 21369, 21370, and 21371)		21372	A	1	3.90	36.99	55.18	3.93	.74	5.53	77.09	1.62	11.09	1.8	7,656	13,781
				2	.....	38.49	57.42	4.09	.77	5.31	80.22	1.69	7.92	.....	7,967	14,341
				3	.....	40.13	59.87	.....	.80	5.54	83.64	1.76	8.26	.....	8,306	14,951
1 mile south of; Ross-Petrey mine, Fire Clay, Dean, or No. 4 bed (face of 2 drift entry, main entry, 500 feet from drift mouth).		21686	A	1	4.05	36.00	54.04	5.91	.65	.....	.....	.....	.....	1.8	7,462	13,432
				2	.....	37.52	56.32	6.16	.68	.....	.....	.....	.....	.....	7,777	13,999
				3	.....	39.98	60.02	.....	.72	.....	.....	.....	.....	.....	8,287	14,917
Lennut; North Fork mine, Fire Clay, Dean, or No. 4 bed (face of 1 left entry, 700 feet from drift mouth).		21359	A	1	3.40	37.29	55.01	4.30	1.05	.....	.....	.....	.....	1.2	7,660	13,788
Same (face of main entry, 900 feet from drift mouth)		21360	A	1	4.23	38.17	53.69	3.91	.78	.....	.....	.....	.....	2.1	7,621	13,718
Same (face of 15 room, left entry, 2 main entry, 700 feet from opening).		21361	A	1	3.85	36.96	54.86	4.33	.84	.....	.....	.....	.....	1.7	7,610	13,698
Same (face of 18 room, 2 left entry, 750 feet from opening)		21362	A	1	4.32	37.16	54.75	3.77	.69	.....	.....	.....	.....	2.1	7,637	13,747
Same (composite of samples 21359, 21360, 21361, and 21362)		21363	A	1	3.89	37.25	54.80	4.06	.83	5.56	76.78	1.74	11.03	1.8	7,626	13,727
				2	.....	38.76	57.02	4.22	.86	5.34	79.89	1.81	7.88	.....	7,935	14,283
				3	.....	40.47	59.53	.....	.90	5.58	83.41	1.89	8.22	.....	8,285	14,913
Lothair, ½ mile southeast of; Ashless mine, Fire Clay, Dean, or No. 4 bed (face of 1 main entry, 700 feet from drift mouth).		21349	A	1	4.11	36.31	54.82	4.76	.61	.....	.....	.....	.....	2.3	7,583	13,649
Same (face of 2 main entry)		21350	A	1	3.81	36.11	56.06	4.02	.69	.....	.....	.....	.....	2.0	7,654	13,777
Same (face of 2 left entry, 500 feet from mine opening)		21351	A	1	4.30	36.56	53.83	5.31	.73	.....	.....	.....	.....	2.6	7,512	13,522
Same (face of 2 right entry, 550 feet from mine opening)		21352	A	1	4.20	35.78	53.28	6.74	.63	.....	.....	.....	.....	2.6	7,376	13,277
Same (composite of samples 21349, 21350, 21351, 21352)		21353	A	1	4.16	36.61	53.99	5.24	.64	5.53	76.49	1.70	10.40	2.4	7,528	13,550
				2	.....	38.20	56.33	5.47	.67	5.29	79.81	1.77	6.99	.....	7,855	14,139
				3	.....	40.41	59.59	.....	.71	5.60	84.43	1.87	7.39	.....	8,310	14,958
1 mile north of; Kentucky Jewel mine, Flag or No. 7 bed (face of 3 main entry, 600 feet from mine opening).		21344	A	1	4.90	34.50	53.15	7.45	.78	.....	.....	.....	.....	2.8	7,255	13,059
Same (face of 4 main entry, 500 feet from mine opening)		21345	A	1	4.00	36.61	53.56	5.83	.68	.....	.....	.....	.....	2.0	7,494	13,489
Same (face of 1 entry, 1,400 feet from drift mouth)		21346	A	1	5.00	35.78	52.78	6.44	.93	.....	.....	.....	.....	2.9	7,341	13,214
Same (face of 5 entry, 400 feet from drift mouth)		21347	A	1	4.31	34.42	52.29	8.98	.77	.....	.....	.....	.....	2.2	7,174	12,913
Same (composite of samples 21344, 21345, 21346, and 21347)		21348	A	1	4.53	35.38	52.89	7.20	.73	5.37	73.85	1.63	11.22	2.5	7,323	13,181
				2	.....	37.06	55.40	7.54	.76	5.10	77.35	1.71	7.54	.....	7,670	13,806
				3	.....	40.08	59.92	.....	.82	5.52	83.65	1.85	8.16	.....	8,295	14,931
PIKE COUNTY.																
Sprig (W. Va.), ½ mile south of; Burnwell No. 2 mine, Rawl, No. 2, or Gas bed (9 room, 4 left entry, main entry, 2,000 feet from mine mouth.)		17459	B	1	3.21	33.04	58.67	5.08	.62	5.33	78.45	1.40	9.12	1.4	7,711	13,880
				2	.....	34.14	60.61	5.25	.64	5.14	81.05	1.45	6.47	.....	7,967	14,341
				3	.....	36.03	63.97	.....	.68	5.42	85.54	1.53	6.83	.....	8,408	15,134
Thacker (W. Va.), 1½ miles southwest of; Little Thacker mine, Alum bed (1 right entry, main air course, 700 feet from outcrop).		17460	B	1	2.50	34.85	58.39	4.26	.59	5.22	79.89	1.45	8.59	1.0	7,914	14,245
				2	.....	35.74	59.89	4.37	.61	5.07	81.94	1.49	6.52	.....	8,117	14,611
				3	.....	37.37	62.63	.....	.64	5.30	85.68	1.56	6.82	.....	8,488	15,278
Same, Thacker bed (last right entry, 2 drift, 3,000 feet in)		17461	B	1	2.76	36.21	56.73	4.30	1.35	5.39	79.25	1.47	8.24	1.3	7,877	14,179
				2	.....	37.24	58.34	4.42	1.39	5.22	81.50	1.51	5.96	.....	8,101	14,582
				3	.....	38.96	61.04	.....	1.45	5.46	85.27	1.58	6.24	.....	8,475	15,255
UNION COUNTY.																
Dekoven, ½ mile southeast of; Banks mine, No. 10 bed (2 east entry, 200 feet northeast of opening).		23011	B	1	5.49	34.96	47.68	11.87	3.95	.....	.....	.....	.....	3.4	6,787	12,217
				2	.....	36.99	50.45	12.56	4.18	.....	.....	.....	.....	.....	7,181	12,926
				3	.....	42.30	57.70	.....	4.78	.....	.....	.....	.....	.....	8,212	14,782
2 miles north of; Curlew mine, No. 9 bed, in slope 2,000 feet from mouth.		23010	B	1	3.89	37.06	49.74	9.31	3.49	.....	.....	.....	.....	1.9	7,126	12,827
				2	.....	38.56	51.75	9.69	3.63	.....	.....	.....	.....	.....	7,415	13,347
				3	.....	42.70	57.30	.....	4.02	.....	.....	.....	.....	.....	8,211	14,780

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
KENTUCKY—Continued.																
UNION COUNTY—continued.																
Dekoven, ¾ mile northeast of; Ohio Valley mine, No. 9 bed (face of 6 west entry 1½ miles from entrance.	.....	19169	A	1	4.43	37.48	48.00	10.09	2.46	.....	.....	.....	.....	2.5	6,971	12,540
Same (face of 7 west entry, 1½ miles from entrance)	.....	19170	A	1	4.34	36.07	47.77	11.82	3.99	.....	.....	.....	.....	2.6	6,869	12,364
Same (face of 6 east level, 8,400 feet from entrance)	.....	19171	A	1	5.37	35.73	44.65	14.25	3.74	.....	.....	.....	.....	3.6	6,501	11,702
Same (face of 7 east level, 3,900 feet from foot of slope)	.....	19172	A	1	4.06	35.21	50.10	10.63	4.54	.....	.....	.....	.....	2.1	6,981	12,566
Same (face of 8 room, 12 rise, 6 east entry, 8,000 feet from foot of slope).	.....	19173	A	1	4.02	36.58	46.29	13.11	3.06	.....	.....	.....	.....	2.1	6,703	12,065
Same (rib of fifth rise, 7 west entry, 1½ miles from entrance)	.....	19174	A	1	4.20	35.95	49.13	10.72	3.79	.....	.....	.....	.....	2.2	6,976	12,557
Same (composite of samples 19169, 19170, 19171, 19172, 19173, 19174).	.....	19175	A	1	4.37	36.27	47.67	11.69	3.58	5.04	68.26	1.44	9.99	2.5	6,847	12,325
				2	.....	37.93	49.85	12.22	3.74	4.76	71.38	1.51	6.39	.....	7,160	12,888
				3	.....	43.21	56.79	.....	4.26	5.42	81.32	1.72	7.28	.....	8,157	14,683
1 mile north of; Syres mine, No. 10 bed (3 north entry, main entry, 550 feet northwest of opening).	.....	23012	B	1	5.31	35.49	48.39	10.81	3.95	.....	.....	.....	.....	3.2	6,885	12,393
				2	.....	37.48	51.10	11.42	4.17	.....	.....	.....	.....	.....	7,271	13,088
				3	.....	42.31	57.69	.....	4.71	.....	.....	.....	.....	.....	8,208	14,774
Morganfield, ½ mile north of; Morganfield mine, No. 11 bed (face of 5 north entry, 2,400 feet from shaft).	.....	19055	A	1	8.41	37.62	44.35	9.62	3.66	.....	.....	.....	.....	3.3	6,551	11,792
Same (face of 16 room, 3 south entry, 1,500 feet from shaft)	.....	19056	A	1	7.89	38.05	44.31	9.75	3.99	.....	.....	.....	.....	3.3	6,577	11,839
Same (face of 30 room, 1 south entry, west main entry, 1,700 feet from shaft).	.....	19057	A	1	7.48	38.36	42.29	11.87	4.54	.....	.....	.....	.....	3.3	6,386	11,495
Same (face of 28 room, 2 south entry, 1,800 feet from shaft)	.....	19058	A	1	8.18	38.11	44.23	9.48	4.21	.....	.....	.....	.....	3.2	6,559	11,806
Same (composite of samples 19055, 19056, 19057, and 19058)	.....	19059	A	1	7.96	38.45	43.29	10.30	4.15	5.33	64.84	1.33	14.05	3.3	6,530	11,754
				2	.....	41.78	47.03	11.19	4.51	4.83	70.45	1.45	7.57	.....	7,095	12,771
				3	.....	47.04	52.96	.....	5.08	5.44	79.33	1.63	8.52	.....	7,989	14,38
Spring Grove, 1 mile northeast of; Buchanan mine, No. 11 bed (300 feet southwest of shaft).	.....	23013	B	1	8.68	37.40	44.80	9.12	3.67	.....	.....	.....	.....	5.2	6,601	11,882
				2	.....	40.96	49.05	9.99	4.02	.....	.....	.....	.....	.....	7,229	13,012
				3	.....	45.51	54.49	.....	4.47	.....	.....	.....	.....	.....	8,031	14,456
Sturgis, 3½ miles northwest of; Crittenden mine, No. 6 bed (rib of 1 west entry, main north entry, 800 feet from entrance).	.....	19113	A	1	3.77	37.04	49.86	9.33	3.61	.....	.....	.....	.....	1.8	7,161	12,890
				2	.....	38.49	51.81	9.70	3.75	.....	.....	.....	.....	.....	7,442	13,396
				3	.....	42.62	57.38	.....	4.15	.....	.....	.....	.....	.....	8,241	14,834

Same (face of 22 room, 2 east entry, main north entry, 1,000 feet from entrance).	19114	A	1	4.36	37.94	50.97	6.73	2.17					2.5	7,410	13,338
Same (face 18 room, 2 east entry, main north entry, 2,200 feet from entrance).	19115	A	1	4.43	37.13	49.60	8.84	2.66					2.3	7,224	13,003
Same (face of 20 room, 2 east entry, main north entry, 2,200 feet from entrance).	19116	A	1	4.47	36.87	49.82	8.84	2.95					2.3	7,201	12,962
Same (composite of samples 19114, 19115, and 19116)	19356	A	1	4.49	36.63	50.65	8.23	2.59	5.38	72.33	1.62	9.85	2.4	7,233	13,019
			2	.....	38.35	53.03	8.62	2.71	5.11	75.73	1.70	6.13	.....	7,573	13,631
			3	.....	41.97	58.03	.....	2.97	5.59	82.87	1.86	6.71	.....	8,287	14,917
2 miles northwest of; No. 8 mine, No. 9 bed (rib of 3 west entry, 850 feet from slope mouth).	19071	A	1	3.50	38.14	48.12	10.24	3.71					1.8	7,145	12,861
Same (face of 4 west air course, 1,800 feet from slope mouth)	19072	A	1	6.19	36.69	45.10	12.02	4.60					4.5	6,750	12,150
Same (rib of main slope entry, 2,000 feet from slope mouth)	19073	A	1	4.42	37.87	46.57	11.14	2.96					2.7	6,983	12,569
Same (face of 4 east level, 2,098 feet from slope mouth)	19074	A	1	3.97	36.28	48.95	10.80	4.19					2.1	7,026	12,647
Same (face of 3 east level, 2,000 feet from slope mouth)	19075	A	1	3.86	36.62	48.20	11.32	4.57					2.0	6,968	12,542
Same (composite of samples 19071, 19072, 19073, 19074, and 19075)	19076	A	1	4.32	37.24	47.31	11.13	3.97	5.12	69.12	1.53	9.13	2.6	6,979	12,562
			2	.....	38.92	49.45	11.63	4.15	4.85	72.24	1.60	5.53	.....	7,294	13,129
			3	.....	44.04	55.96	.....	4.70	5.49	81.75	1.81	6.25	.....	8,254	14,857
1½ miles northeast of; No. 9 mine, No. 9 bed (face of east entry, 135 feet from shaft).	19081	A	1	3.36	36.26	49.03	11.35	4.97					1.5	7,037	12,667
Same (face of main west entry, 400 feet from shaft)	19082	A	1	3.84	35.82	48.98	11.36	3.74					2.1	6,989	12,580
Same (face of main east entry, 450 feet from shaft)	19083	A	1	3.50	37.69	48.99	9.82	3.57					1.6	7,143	12,857
Same (75 feet northwest of shaft)	19084	A	1	3.71	37.64	50.21	8.44	3.27					1.8	7,264	13,075
Same (composite of samples 19081, 19082, 19083, and 19084)	19085	A	1	3.55	36.71	49.42	10.32	3.98	5.15	70.71	1.58	8.26	1.8	7,110	12,798
			2	.....	38.06	51.24	10.70	4.13	4.94	73.31	1.64	5.28	.....	7,372	13,270
			3	.....	42.62	57.38	.....	4.62	5.53	82.09	1.84	5.92	.....	8,255	14,859
Uniontown, 1½ miles from; River mine, No. 11 bed (face of main east entry, 1,400 feet from shaft).	18993	A	1	9.31	38.26	42.89	9.54	3.59					3.6	6,470	11,646
Same (face of main west entry, 1,330 feet from shaft)	18994	A	1	9.64	37.26	44.51	8.59	3.13					4.0	6,528	11,750
Same (face of 24 room, 1 south entry, east side, 1,285 feet from shaft).	18995	A	1	8.81	37.62	42.70	10.87	4.20					3.7	6,371	11,468
Same (face of 1 south entry, main west entry, 30 feet inby 22 room).	18996	A	1	9.37	38.04	44.55	8.04	3.41					4.0	6,585	11,853
Same (face of 3 south entry, 1,290 feet from shaft)	18997	A	1	9.42	37.48	43.27	9.83	3.62					3.6	6,434	11,581
Same (composite of samples 18993, 18994, 18995, 18996, and 18997)	18998	A	1	9.31	37.77	43.59	9.33	3.58	5.47	64.30	1.32	16.00	3.8	6,478	11,660
			2	.....	41.65	48.06	10.29	3.95	4.90	70.90	1.46	8.50	.....	7,143	12,857
			3	.....	46.43	53.57	.....	4.40	5.46	79.03	1.63	9.48	.....	7,962	14,332
WEBSTER COUNTY.															
Clay, 1¼ miles northwest of; No. 7 mine, No. 12 bed (face of west dip entry air course, 1,850 feet from shaft).	19148	A	1	5.73	36.14	50.62	7.51	2.00					2.9	7,176	12,916
Same (neck of break-through between 3 and 4 south entries, 2 right entry, 1,600 feet from shaft).	19149	A	1	5.24	36.16	52.17	6.43	1.30					2.4	7,278	13,100
Same (face of 4 south entry, 2 left entry, 2,800 feet from shaft)	19150	A	1	6.38	34.50	49.27	9.85	1.09					3.4	6,849	12,328
Same (face of 10 room, 1 left entry, west dip entry, 2,000 feet from shaft).	19151	A	1	5.65	35.37	52.04	6.94	1.17					2.5	7,204	12,967
Same (face of 14 room, 1 south entry, 2 right entry, 1,600 feet from shaft).	19152	A	1	5.09	36.18	50.14	8.59	2.78					2.5	7,094	12,769
Same (east break-through at face of 2 left entry, 3,000 feet from main shaft).	19153	A	1	5.80	33.42	52.04	8.74	1.13					2.4	7,000	12,600
Same (composite of samples 19148, 19149, 19150, 19151, 19152, and 19153).	19154	A	1	5.58	35.04	51.32	8.06	1.59	5.32	71.49	1.50	12.04	2.7	7,086	12,755
			2	.....	37.11	54.35	8.54	1.68	4.98	75.72	1.59	7.49	.....	7,505	13,509
			3	.....	40.58	59.42	.....	1.84	5.45	82.79	1.74	8.18	.....	8,206	14,771

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
KENTUCKY—Continued.																
WEBSTER COUNTY—continued.																
Providence, ⅔ mile north of; No. 3 mine, No. 9 bed (8 room, 2 east entry, main north entry, 1,300 feet from shaft).	.....	19141	A	1	5.60	37.18	47.32	9.90	4.32	.....	.....	.....	.....	2.9	6,871	12,368
Same (face of 8 room, 2 west entry, main north entry, 1,200 feet from shaft).	.....	19142	A	1	6.10	36.73	45.59	11.58	4.08	.....	.....	.....	.....	3.1	6,641	11,954
Same (face of 14 room, 2 west entry, main north entry, 1,450 feet from shaft).	.....	19143	A	1	5.55	37.94	48.27	8.24	2.72	.....	.....	.....	.....	2.8	7,018	12,633
Same (face of 6 room, 3 west entry, main north entry, 1,500 feet from shaft).	.....	19144	A	1	4.95	37.23	46.49	11.33	5.60	.....	.....	.....	.....	2.6	6,779	12,202
Same (in last break-through in 19 room, 1 west entry, main north entry, 1,500 feet from shaft).	.....	19145	A	1	5.51	36.52	47.39	10.58	3.56	.....	.....	.....	.....	2.5	6,804	12,247
Same (face of main north entry, 1,500 feet from shaft)	.....	19146	A	1	5.28	37.96	48.57	8.19	3.34	.....	.....	.....	.....	2.6	7,064	12,715
Same (composite of samples 19141, 19142, 19143, 19144, 19145, and 19146).	.....	19147	A	1	5.62	37.20	47.17	10.01	3.89	5.23	68.09	1.43	11.35	2.8	6,850	12,330
				2	.....	39.41	49.98	10.61	4.12	4.88	72.14	1.52	6.73	.....	7,258	13,064
				3	.....	44.09	55.91	.....	4.61	5.46	80.70	1.70	7.53	.....	8,120	14,616
Providence, 1½ miles northeast of; Shamrock mine, No. 11 bed (face of 45 room, northwest entry, 2,700 feet from shaft).	.....	19176	A	1	5.94	37.32	46.81	9.93	3.83	.....	.....	.....	.....	2.7	6,758	12,164
Same (face of 8 room, 5 west entry, 2,000 feet from shaft)	.....	19177	A	1	5.71	38.58	47.85	7.86	3.58	.....	.....	.....	.....	2.3	7,006	12,611
Same (face of 24 room, 4 southeast entry, 3,000 feet from shaft)	.....	19178	A	1	5.71	38.58	45.65	10.06	3.96	.....	.....	.....	.....	2.4	6,743	12,137
Same (face of 29 room, 3 northwest entry, 2,600 feet from shaft)	.....	19179	A	1	5.63	38.72	47.16	8.49	3.72	.....	.....	.....	.....	2.7	6,947	12,505
Same (face of 7 northeast entry, 2,000 feet from shaft)	.....	19180	A	1	5.75	38.48	47.24	8.53	3.56	.....	.....	.....	.....	2.3	6,911	12,440
Same (face of 46 room, 1 southeast entry, 3,500 feet from shaft)	.....	19181	A	1	5.49	38.78	46.93	8.80	3.94	.....	.....	.....	.....	2.6	6,877	12,379
Same (last break-through, 1 northeast entry, 2,100 feet from shaft).	.....	19182	A	1	6.67	36.94	47.03	9.36	4.43	.....	.....	.....	.....	3.2	6,753	12,155
Same (face of 5 northeast entry, 2,400 feet from shaft)	.....	19183	A	1	5.59	37.01	46.84	10.56	4.86	.....	.....	.....	.....	2.5	6,745	12,141
Same (face of 3 northeast entry, 2,400 feet from shaft)	.....	19184	A	1	7.48	36.96	46.53	9.03	3.98	.....	.....	.....	.....	3.9	6,739	12,130
Same (composite of samples 19176 to 19184)	.....	19185	A	1	6.00	37.88	46.80	9.32	3.99	5.26	68.21	1.31	11.91	2.7	6,827	12,289
				2	.....	40.30	49.79	9.91	4.24	4.88	72.56	1.39	7.02	.....	7,263	13,073
				3	.....	44.73	55.27	.....	4.71	5.42	80.54	1.54	7.79	.....	8,062	14 512
Sebree, ½ mile north of; Sebree mine, No. 9 bed (last room, air course, 2 north entry, main east entry, 1,400 feet from shaft).	.....	18967	A	1	10.66	37.02	43.31	9.01	3.13	.....	.....	.....	.....	3.1	6,397	11,515

Same (face of 2 north entry, main east entry, 1,600 feet from shaft)	18968	A	1	9.70	37.06	42.32	10.92	3.80	.....	.....	.....	.....	2.5	6,233	11,219
Same (composite of samples 18967 and 18968)	18969	A	1	10.08	37.13	42.87	9.92	3.47	5.39	63.24	1.36	16.62	2.8	6,318	11,372
			2	.....	41.29	47.68	11.03	3.86	4.75	70.33	1.51	8.52	.....	7,026	12,647
			3	.....	46.41	53.59	.....	4.34	5.34	79.05	1.70	9.57	.....	7,897	14,215
Wheatcroft; No. 4 mine, No. 11 bed (face of 64 room, 5 west entry, 5,100 feet from entrance).	19119	A	1	4.24	38.19	46.13	11.44	4.10	.....	.....	.....	.....	2.1	6,952	12,514
Same (14 room, 6 west entry, 3,000 feet from entrance)	19120	A	1	4.95	36.78	49.02	9.25	3.89	.....	.....	.....	.....	2.8	7,081	12,746
Same (left rib of 5 west entry, 5,100 feet from entrance)	19121	A	1	4.17	38.49	48.58	8.76	3.80	.....	.....	.....	.....	2.0	7,160	12,888
Same (face of 4 west entry, 5,000 feet from entrance)	19122	A	1	3.81	37.81	48 04	10.34	3.99	.....	.....	.....	.....	1.8	7,055	12,699
Same (face of 6 east air course, 2,800 feet from entrance)	19123	A	1	4.16	37.44	48.17	10.23	4.02	.....	.....	.....	.....	1.4	7,038	12,668
Same (composite of samples 19119, 19120, 19121, 19122, and 19123)	19124	A	1	4.27	38.06	47.58	10.09	3.99	5.22	69.49	1.43	9.78	2.0	7,041	12,674
			2	.....	39.76	49.70	10.54	4.17	4.96	72.59	1.49	6.25	.....	7,355	13,239
			3	.....	44.44	55.56	.....	4.66	5.54	81.14	1.67	6.99	.....	8,221	14,798
MARYLAND.															
ALLEGANY COUNTY.															
Lonaconing, ½ mile north of; Kingsland mine, Tyson bed (face of 4 right entry, 2,600 feet N. 65° W. from pit mouth).	20332	A	1	2.23	20.85	70.67	6.25	1.08	.....	.....	.....	.....	1.6	7,950	14,310
Same (face 2 south entry, 1,400 feet N. 71° W. from pit mouth)	20333	A	1	3.62	18.43	69.17	8.78	1.37	.....	.....	.....	.....	3.0	7,605	13,689
Same (face of 1 north entry, 2,900 feet N. 65° W. from pit mouth)	20334	A	1	3.58	21.02	67.83	7.57	1.13	.....	.....	.....	.....	2.9	7,694	13,849
Same (face of main entry, 3,500 feet N. 70° W. from pit mouth)	20335	A	1	3.65	20.40	66.45	9.50	1.50	.....	.....	.....	.....	3.1	7,504	13,507
Same (composite of samples 20332, 20333, 20334, and 20335)	20336	A	1	3.28	20.44	68.30	7.98	1.27	4.69	79.23	1.68	5.15	2.7	7,702	13,864
			2	.....	21.13	70.62	8.25	1.31	4.48	81.92	1.74	2.30	.....	7,963	14,333
			3	.....	23.03	76.97	.....	1.43	4.88	89.28	1.90	2.51	.....	8,679	15,622
Mertens; Mertens mine, Davis 6-foot bed (face of 4 room, right (Frederick) heading, about 2,150 feet from tunnel mouth).	17492	A	1	3.28	20.34	69.16	7.22	1.69	.....	.....	.....	.....	2.5	7,790	14,022
Same (face of left (Frederick) heading, 150 feet from slope, and about 1,700 feet from end of tunnel).	17493	A	1	4.04	20.14	65.56	10.26	1.84	.....	.....	.....	.....	3.2	7,421	13,358
Same (12 room, 1 right heading, about 1,450 feet from end of tunnel).	17494	A	1	2.39	19.31	68.55	9.75	1.77	.....	.....	.....	.....	1.5	7,599	13,678
Same (face of cross room, 10 room, 1 right heading, about 1,100 feet from end of tunnel).	17495	A	1	5.34	18.22	64.63	11.81	1.94	.....	.....	.....	.....	4.4	7,170	12,906
Same (face of 15 room, 1 right heading, about 1,650 feet from end of tunnel).	17496	A	1	2.94	20.57	64.30	12.19	4.16	.....	.....	.....	.....	2.1	7,309	13,156
Same (face of 17 room, 1 right heading, about 1,850 feet from end of tunnel).	17497	A	1	3.07	20.40	63.61	12.92	3.40	.....	.....	.....	.....	2.1	7,231	13,016
Same (composite of samples 17492, 17493, 17494, 17495, 17496, and 17497).	17498	A	1	3.48	19.93	65.85	10.74	2.47	4.80	76.64	1.60	3.75	2.6	7,434	13.381
			2	.....	20.65	68.22	11.13	2.56	4.57	79.41	1.66	.67	.....	7,702	13,864
			3	.....	23.24	76.76	.....	2.88	5.14	89.35	1.87	.76	.....	8,666	15,599
GARRETT COUNTY.															
Dodson; Dodson mine, Lower Kittanning bed (face of 14 room, 11 right entry, 4,300 feet northwest of entrance).	17647	A	1	1.97	15.40	68.58	14.05	4.01	.....	.....	.....	.....	1.4	7,186	12,935
Same (face of main heading air course, 800 feet from 3 opening)	17648	A	1	2.05	16.86	69.90	11.19	2.45	.....	.....	.....	.....	1.4	7,403	13,325
Same (pillar 30 feet inby 41 room, 7 right entry, 4,600 feet northwest of opening).	17649	A	1	2.41	16.17	70.09	11.33	2.18	.....	.....	.....	.....	1.9	7,434	13,381
Same (face of 17 room, 10 left entry, 4,300 feet west of entrance)	17650	A	1	2.56	16.25	70.06	11.13	1.86	.....	.....	.....	.....	1.9	7,458	13,424
Same (face of 31 room, 9 right entry, 4,700 feet northwest of entrance).	17651	A	1	2.38	17.34	69.09	11.19	2.81	.....	.....	.....	.....	1.8	7,425	13,365
Same (face of 3 left air course, 600 feet ahead of 2 parallel, 3,000 feet southwest of 1 opening).	17652	A	1	1.95	16.32	71.52	10.21	2.06	.....	.....	.....	.....	1.4	7,553	13,595

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample. Laboratory No.	Sample. Kind.	Sample. Condition.	Proximate. Moisture.	Proximate. Volatile matter.	Proximate. Fixed carbon.	Proximate. Ash.	Ultimate. Sulphur.	Ultimate. Hydrogen.	Ultimate. Carbon.	Ultimate. Nitrogen.	Ultimate. Oxygen.	Air-drying loss.	Calorific value. Calories.	Calorific value. British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
MARYLAND—Continued.																
GARRETT COUNTY—continued.																
Dodson; Dodson mine. Lower Kittanning bed (composite samples of 17647, 17648, 17649, 17650, 17651, and 17652).	.....	17653	A	1	2.33	15.96	70.20	11.51	2.53	4.31	76.77	1.25	3.63	1.6	7,413	13,343
				2	.....	16.34	71.87	11.79	2.59	4.15	78.60	1.28	1.59	.....	7,590	13,662
				3	.....	18.52	81.48	.....	2.94	4.70	89.11	1.45	1.80	.....	8,605	15,489
Same, Upper Kittanning bed (near face of main entry, 200 feet from mouth of 5 opening).	.....	17654	A	1	1.20	15.80	72.85	10.15	1.03	.....	.....	.....	.....	.3	7,711	13,880
				2	.....	15.99	73.74	10.27	1.04	.....	.....	.....	.....	.....	7,804	14,047
				3	.....	17.82	82.18	.....	1.16	.....	.....	.....	.....	.....	8,698	15,656
MISSOURI.																
BARTON COUNTY.																
Pittsburg, Kans., 4 miles east and 3 miles north of; J. J. Stephenson mine; Cherokee bed (at working face, steam-shovel strip pit)..	.....	23241	B	1	6.34	35.31	51.81	6.54	3.70	5.50	72.63	1.28	10.35	4.2	7,340	13,212
				2	.....	37.70	55.32	6.98	3.95	5.12	77.55	1.37	5.03	.....	7,837	14,107
				3	.....	40.53	59.47	.....	4.25	5.50	83.37	1.47	5.41	.....	8,425	15,165
Same (1,000 feet east from Tipple along fault, "dead" coal)....	.....	*23242	B	1	38.52	23.42	30.87	7.19	.56	5.93	38.48	.83	47.01	29.7	3,250	5,850
				2	.....	38.09	50.22	11.69	.91	2.68	62.59	1.35	20.78	.....	5,286	9,515
				3	.....	43.13	56.87	.....	1.03	3.03	70.88	1.53	23.53	.....	5,986	10,775
Same (200 feet from east line of pit; "shelly" coal).....	.....	23243	B	1	16.19	27.94	52.63	3.24	.89	5.44	64.26	1.13	25.04	11.3	6,105	10,989
				2	.....	33.34	62.79	3.87	1.06	4.34	76.68	1.35	12.70	.....	7,284	13,112
				3	.....	34.68	65.32	.....	1.10	4.51	79.77	1.40	13.22	.....	7,578	13.640
MONTANA.																
BIG HORN COUNTY.																
Sanders, 36 miles south of; sec. 30, T. 1 N., R. 38 E., prospect "M" bed.	.....	*17711	B	1	22.58	31.87	39.55	6.00	.51	.....	.....	.....	.....	3.7	4,895	8,811
				2	.....	41.17	51.08	7.75	.66	.....	.....	.....	.....	.....	6,323	11,381
				3	.....	44.63	55.37	.....	.72	.....	.....	.....	.....	.....	6,854	12,337

CARBON COUNTY.																	
Bearcreek, ¾ mile northwest of: sec. 31, T. 7 S., R. 21 E., International mine, "No. 3" bed (face of 6 room, 2 west entry, slope, 975 feet west of opening).	.....	*18691	A	1	11.13	35.15	45.42	8.30	1.88	.....	.....	.....	.....	3.8	5,998	10,796
				2	.....	39.55	51.11	9.34	2.12	.....	.....	.....	.....	.....	6,749	12,148
				3	.....	43.62	56.38	.....	2.34	.....	.....	.....	.....	.....	7,444	13,399
Same (face of 4 west entry, main incline, 2,400 feet northwest of opening).	.....	*18692	A	1	12.50	33.29	46.42	7.79	1.62	.....	.....	.....	.....	3.8	5,923	10,661
Same (rib between 32 and 33 rooms, 2 west entry, main incline, 3,200 feet northwest of opening).	.....	*18693	A	1	11.01	34.88	45.14	8.97	1.79	.....	.....	.....	.....	3.4	5,980	10,764
Same (composite of samples 18692 and 18693)	.....	*18694	A	1	11.74	34.07	45.80	8.39	1.68	5.50	60.56	1.63	22.24	3.6	5,977	10,759
				2	.....	38.60	51.89	9.51	1.90	4.76	68.61	1.85	13.37	.....	6,772	12,190
				3	.....	42.66	57.34	.....	2.10	5.26	75.82	2.04	14.78	.....	7,484	13,471
Same (face of 16 room, 3 west entry, 2,700 feet northwest of opening).	.....	*18823	A	1	11.74	33.82	44.67	9.77	1.76	5.53	59.74	1.68	21.52	4.0	5,840	10,512
				2	.....	38.32	50.61	11.07	1.99	4.79	67.69	1.90	12.56	.....	6,617	11,911
				3	.....	43.09	56.91	.....	2.24	5.39	76.12	2.14	14.11	.....	7,441	13,394
CHOUTEAU COUNTY.																	
Virgelle, 16 miles southeast of: sec. 6, T. 24 N., R. 13 E.; Deda mine (end of main entry, 175 feet south, 50 feet east from opening).	.....	*19790	B	1	18.15	29.26	41.26	11.33	.81	5.61	53.21	1.20	27.84	7.2	5,064	9,115
				2	.....	35.75	50.41	13.84	.99	4.39	65.01	1.47	14.30	.....	6,187	11,137
				3	.....	41.49	58.51	.....	1.15	5.10	75.45	1.71	16.59	.....	7,181	12,926
20 miles southeast of; SW. ¼ sec. 17, T. 24 N., R. 13 E.; Price Sexton mine (main entry, 50 feet south of opening).	.....	*19795	B	1	17.48	30.16	41.19	11.17	.61	5.62	54.42	1.11	27.07	4.1	5,176	9,317
				2	.....	36.55	49.91	13.54	.74	4.46	65.95	1.35	13.96	.....	6,272	11,290
				3	.....	42.27	57.73	.....	.86	5.16	76.28	1.56	16.14	.....	7,254	13,057
DAWSON COUNTY.																	
Jordan, 1 mile west of; 90 miles from Miles City; Foster prospect (wall of entry 50 feet from mouth of mine).	.....	*19923	B	1	28.32	26.45	33.64	11.59	.45	.....	.....	.....	.....	19.2	4,088	7,358
				2	.....	36.90	46.93	16.17	.63	.....	.....	.....	.....	.....	5,703	10,265
				3	.....	44.02	55.98	.....	75	.....	.....	.....	.....	.....	6,803	12,245
FALLON COUNTY.																	
Camp Crook (S. Dak.), 4½ miles northwest of; SE. ¼ sec. 12, T. 3 S., R. 62 E.; Horner mine, Kerr bed (at surface of open pit).	.....	*20370	B	1	41.30	24.64	26.87	7.19	.62	.....	.....	.....	.....	34.3	3,441	6,194
				2	.....	41.98	45.77	12.25	1.06	.....	.....	.....	.....	.....	5,862	10,552
				3	.....	47.84	52.16	.....	1.21	.....	.....	.....	.....	.....	6,680	12,024
4½ miles northwest of; NW. ¼ sec. 11, T. 3 S., R. 62 E.; Kerr mine, Kerr bed (at surface of open pit).	.....	*20372	B	1	39.03	22.64	23.86	14.47	1.60	.....	.....	.....	.....	33.5	3,112	5,602
				2	.....	37.13	39.14	23.73	2.62	.....	.....	.....	.....	.....	5,104	9,187
				3	.....	48.68	51.32	.....	3.44	.....	.....	.....	.....	.....	6,692	12,046
FERGUS COUNTY.																	
Winifred, 5 miles northeast of; sec. 31, T. 22 N., R. 19 E.; Calderwood mine (room about 50 feet east of mine mouth).		*20000	B	1	22.81	27.67	37.75	11.77	.82	5.96	49.34	1.08	31.03	14.4	4,710	8,478
				2	.....	35.85	48.90	15.25	1.06	4.44	63.92	1.40	13.93	.....	6,102	10,984
				3	.....	42.30	57.70	.....	1.25	5.24	75.42	1.65	16.44	.....	7,200	12,960
20 miles northeast of: sec. 12, T. 22 N., R. 16 E.; Millsap mine (left wall of entry, 10 feet from mine mouth).	.....	*22622	B	1	23.46	28.37	32.75	15.42	.84	.....	.....	.....	.....	12.7	4,156	7,481
				2	.....	37.07	42.78	20.15	1.10	.....	.....	.....	.....	.....	5,430	9,774
				3	.....	46.42	53.58	.....	1.38	.....	.....	.....	.....	.....	6,800	12,240
1½ miles north of; NE. ¼ sec. 23, T. 21 N., R. 18 E.; prospect (75 feet in, on right wall of entry).	.....	*22548	B	1	24.82	27.16	38.56	9.46	.53	5.96	49.04	1.18	33.83	13.5	4,632	8,338
				2	.....	36.13	51.29	12.58	.70	4.26	65.23	1.57	15.66	.....	6,161	11,090
				3	.....	41.33	58.67	.....	.80	4.87	74.62	1.80	17.91	.....	7,048	12,686
1½ miles southeast of; sec. 36, T. 21 N., R. 18 E.; open cut	.....	*22566	B	1	33.94	26.11	27.08	12.87	.58	.....	.....	.....	.....	23.8	2,984	5,371
				2	.....	39.53	40.99	19.48	.88	.....	.....	.....	.....	.....	4,517	8,131
				3	.....	49.09	50.91	.....	1.09	.....	.....	.....	.....	.....	5,610	10,098
2½ miles northeast of; sec. 24, T. 21 N., R. 18 E.; open cut	.....	*22550	B	1	23.99	28.73	32.59	14.69	1.88	.....	.....	.....	.....	16.0	4,184	7,531
				2	.....	37.80	42.87	19.33	2.47	.....	.....	.....	.....	.....	5,504	9,907
				3	.....	46.86	53.14	.....	3.06	.....	.....	.....	.....	.....	6,823	12,281

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
MONTANA—Continued.																
FIRGUS COUNTY—continued.																
Winifred, 5 miles north of; sec. 12, T. 21 N., R. 18 E.; outcrop		*22619	B	1	27.55	28.67	30.14	13.64	0.50					18.6	3,684	6,631
				2		39.57	41.60	18.83	.69						5,085	9,153
				3		48.75	51.25		.85						6,265	11,277
9 miles northwest of; sec. 25, T. 22 N., R. 17 E.; open cut		*22620	B	1	31.17	26.81	33.36	8.66	.60					21.2	3,910	7,038
				2		38.95	48.47	12.58	.87						5,681	10,226
				3		44.55	55.45		1.00						6,498	11,697
9 miles northeast of; sec. 12, T. 21 N., R. 19 E.; outcrop		*22621	B	1	29.87	27.93	34.17	8.03	.77					20.4	4,080	7,344
				2		39.83	48.72	11.45	1.10						5,818	10,472
				3		44.98	55.02		1.24						6,570	11,826
10 miles northeast of; sec. 24, T. 21 N., R. 19 E.; open cut		*22549	B	1	22.15	29.09	37.15	11.61	1.25					12.1	4,694	8,449
				2		37.37	47.72	14.91	1.61						6,029	10,852
				3		43.92	56.08		1.89						7,085	12,753
20 miles northwest of; NW. ¼ sec. 5, T. 22 N., R. 17 E.; open cut		*22565	B	1	18.99	29.79	33.40	17.82	.94					9.0	4,357	7,843
				2		36.77	41.23	22.00	1.16						5,378	9,681
				3		47.14	52.86		1.49						6,895	12,411
23 miles northwest of; SW. ¼ sec. 6, T. 22 N., R. 17 E.; outcrop		*22588	B	1	20.39	28.55	36.66	14.40	.64					8.0	4,552	8,194
				2		35.86	46.05	18.09	.80						5,718	10,292
				3		43.78	56.22		.98						6,981	12,566
HILL COUNTY.																
Havre, 30 miles northwest of; NW. ¼ sec. 7, T. 35 N., R. 13 E.; prospect		*23002	B	1	25.48	29.26	37.11	8.15	.96					14.3	4,555	8,199
				2		39.26	49.80	10.94	1.29						6,112	11,002
				3		44.08	55.92		1.45						6,863	12,353
30 miles northwest of; sec. 20, T. 37 N., R. 15 E.; prospect		*22798	B	1	31.65	28.62	28.10	11.63	.71					18.9	3,513	6,323
				2		41.87	41.11	17.02	1.04						5,140	9,252
				3		50.46	49.54		1.25						6,194	11,149
15 miles northwest of; SW. ¼ NW. ¼, sec. 27, T. 35 N., R. 14 E.; prospect.		*22797	B	1	39.72	27.35	24.34	8.59	.48					29.3	2,932	5,277
				2		45.37	40.38	14.25	.79						4,864	8,755
				3		52.91	47.09		.92						5,672	10,210

16 miles northwest of; NW. ¼ NE. ¼, sec. 29, T. 35 N., R. 14 E.; prospect.	.....	*22794	B	1	40.14	25.70	20.19	13.97	.44	.....	.....	.....	.....	28.4	2,518	4,532
				2	.....	42.93	33.73	23.34	.74	.....	.....	.....	.....	.....	4,207	7,573
				3	.....	56.00	44.00	.....	.97	.....	.....	.....	.....	.....	5,488	9,878
16 miles northwest of; SW. ¼ SW. ¼, sec. 22, T. 35 N., R. 14 E.; prospect.	.....	*22793	B	1	36.76	26.14	22.76	14.34	.58	.....	.....	.....	.....	25.9	2,795	5,031
				2	.....	41.34	35.98	22.68	.92	.....	.....	.....	.....	.....	4,420	7,956
				3	.....	53.47	46.53	.....	1.19	.....	.....	.....	.....	.....	5,716	10,289
16 miles northwest of; NW. ¼ SW. ¼ sec. 28, T. 35 N., R. 14 E.; prospect.	.....	*22796	B	1	30.35	28.19	34.87	6.59	.72	.....	.....	.....	.....	14.9	4,166	7,499
				2	.....	40.48	50.06	9.46	1.03	.....	.....	.....	.....	.....	5,982	10,768
				3	.....	44.71	55.29	.....	1.14	.....	.....	.....	.....	.....	6,607	11,893
17 miles northwest of; SW. ¼ SW. ¼ sec. 31, T. 35 N., R. 14 E.; prospect.	.....	*22799	B	1	23.61	27.28	28.70	20.41	1.25	.....	.....	.....	.....	7.8	3,921	7,058
				2	.....	35.71	37.57	26.72	1.64	.....	.....	.....	.....	.....	5,133	9,239
				3	.....	48.73	51.27	.....	2.24	.....	.....	.....	.....	.....	7,004	12,607
28 miles northwest of; NW. ¼ sec. 23, T. 36 N., R. 14 E.; Wheatman mine (at foot of slope, 200 feet in).	.....	*22795	B	1	26.90	33.49	24.88	14.73	.73	5.99	42.56	.97	35.02	12.0	4,028	7,250
				2	.....	45.81	34.04	20.15	1.00	4.10	58.22	1.33	15.20	.....	5,510	9,918
				3	.....	57.37	42.63	.....	1.25	5.13	72.91	1.67	19.04	.....	6,900	12,420
Rudyard, 28 miles north of; NW. ¼ sec. 28, T. 37 N., R. 9 E.; Banks & Severn mine, "No. 1" bed (75 feet from mine mouth, 1 right room, "new" entry).	.....	*17841	B	1	24.14	29.22	37.36	9.28	1.15	5.98	50.03	1.02	32.54	10.1	4,706	8,471
				2	.....	38.52	49.25	12.23	1.52	4.35	65.95	1.34	14.61	.....	6,203	11,165
				3	.....	43.89	56.11	.....	1.73	4.96	75.14	1.53	16.64	.....	7,067	12,721
32 miles north of; SW. ¼ sec. 2, T. 37 N., R. 9 E.; outcrop	.....	*17892	B	1	31.40	30.46	23.77	14.37	1.35	.....	.....	.....	.....	19.1	.....	.....
				2	.....	44.40	34.65	20.95	1.97	.....	.....	.....	.....	.....	.....	.....
				3	.....	56.17	43.83	.....	2.49	.....	.....	.....	.....	.....	.....	.....
Shelby, 35 miles northeast of; NW. ¼ sec. 6, T. 36 N., R. 2 E.; West Butte mine (100 feet north of shaft).	.....	17842	B	1	7.17	33.95	50.55	8.33	1.77	5.13	67.62	1.42	15.73	1.2	6,541	11,774
				2	.....	36.57	54.46	8.97	1.91	4.66	72.84	1.53	10.09	.....	7,046	12,683
				3	.....	40.17	59.83	.....	2.10	5.12	80.01	1.68	11.09	.....	7,740	13,932
MUSSELSHELL COUNTY.																
Lavinia, 2 miles north of; sec. 24, T. 7 N., R. 22 E.; Bennett mine (small room to left, 150 feet down slope).	.....	*19784	B	1	10.37	31.10	43.48	15.05	1.77	5.29	57.38	1.41	19.10	4.5	5,678	10,220
				2	.....	34.70	48.51	16.79	1.97	4.62	64.02	1.57	11.03	.....	6,335	11,403
				3	.....	41.70	58.30	.....	2.37	5.55	76.94	1.89	13.25	.....	7,613	13,703
18 miles northwest of; sec. 8, T. 8 N., R. 20 E.; Caldwell mine (40 feet down slope).	.....	*19785	B	1	10.43	29.62	43.91	16.04	1.73	.....	.....	.....	.....	4.2	5,611	10,100
				2	.....	33.07	49.02	17.91	1.93	.....	.....	.....	.....	.....	6,264	11,275
				3	.....	40.29	59.71	.....	2.35	.....	.....	.....	.....	.....	7,631	13,736
Roundup, 3½ miles southwest of; sec. 28, T. 8 N., R. 25 E.; Keene mine, Roundup bed (about 500 feet northeast of opening, at side of entry).	.....	17589	B	1	13.46	33.19	45.57	7.78	.51	.....	.....	.....	.....	2.0	6,051	10,892
				2	.....	38.35	52.66	8.99	.59	.....	.....	.....	.....	.....	6,992	12,586
				3	.....	42.14	57.86	.....	.65	.....	.....	.....	.....	.....	7,683	13,829
3½ miles southeast of; SE. ¼ sec. 36, T. 8 N., R. 25 E.; No. 2 mine, Roundup bed (about 800 feet east of foot of shaft).	.....	17586	B	1	13.42	32.35	47.65	6.58	.39	5.59	63.89	.98	22.57	2.2	6,175	11,115
				2	.....	37.36	55.04	7.60	.45	4.74	73.79	1.13	12.29	.....	7,132	12,838
				3	.....	40.43	59.57	.....	.49	5.13	79.86	1.22	13.30	.....	7,719	13,894
½ mile west of; NW. ¼ sec. 23, T. 8 N., R. 25 E.; No. 3 mine, Roundup bed (2 room, 7 west entry, about 3,000 feet west of mouth of entry).	.....	17588	B	1	13.58	32.59	46.79	7.04	.58	.....	.....	.....	.....	2.1	6,104	10,987
				2	.....	37.71	54.14	8.15	.67	.....	.....	.....	.....	.....	7,063	12,713
				3	.....	41.05	58.95	.....	.73	.....	.....	.....	.....	.....	7,689	13,840
3 miles southeast of; SE. ¼ sec. 17, T. 8 N., R. 26 E.; No. 4 mine, Roundup bed (about 3,000 feet S. 5° W. of mouth of mine).	.....	17587	B	1	14.49	31.53	47.48	6.50	.80	.....	.....	.....	.....	3.4	5,751	10,352
				2	.....	36.87	55.53	7.60	.94	.....	.....	.....	.....	.....	6,726	12,107
				3	.....	39.90	60.10	.....	1.02	.....	.....	.....	.....	.....	7,280	13,104
SHERIDAN COUNTY.																
Daleview; sec. 36, T. 37 N., R. 51 E.; Ranous mine, Daleview bed (face in main drift, 400 feet N. 45° E. of opening).	.....	*23008	B	1	36.64	23.15	30.32	9.89	.24	6.27	38.30	.49	44.81	26.5	3,409	6,136
				2	.....	36.54	47.85	15.61	.38	3.47	60.45	.77	19.32	.....	5,380	9,684
				3	.....	43.30	56.70	.....	.45	4.11	71.63	.91	22.90	.....	6,375	11,475
East Scobey, 25 miles northwest of; sec. 16, T. 37 N., R. 45 E.; Coal Creek mine, Coal Creek bed (small drift, 20 feet back from face).	.....	*23007	B	1	41.31	23.03	26.42	9.24	.53	.....	.....	.....	.....	32.6	3,153	5,675
				2	.....	39.24	45.02	15.74	.90	.....	.....	.....	.....	.....	5,372	9,670
				3	.....	46.57	53.43	.....	1.07	.....	.....	.....	.....	.....	6,375	11,475

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
MONTANA—Continued.																
SHERIDAN COUNTY—continued.																
Plentywood, 1½ miles northeast of; sec. 9, T. 35 N., R. 55 E.; Pierce Bros. mine, Richardson bed (100 feet east of mine mouth).	.....	*23595	B	1	41.26	24.92	27.08	6.74	0.42	.....	.....	.....	.....	34.5	3,262	5,872
				2	.....	42.42	46.11	11.47	.72	.....	.....	.....	.....	.....	5,553	9,995
				3	.....	47.92	52.08	.....	.81	.....	.....	.....	.....	.....	6,273	11,291
VALLEY COUNTY.																
East Scobey, 36 miles west-northwest of; sec. 36, T. 37 N., R. 42 E.; Fisher mine (at face of drift, 6 feet north of face of old open pit).	.....	*23005	B	1	41.30	23.29	26.69	8.72	.29	.....	.....	.....	.....	31.6	3,130	5,634
				2	.....	39.68	45.46	14.86	.49	.....	.....	.....	.....	.....	5,332	9,598
				3	.....	46.60	53.40	.....	.58	.....	.....	.....	.....	.....	6,262	11,272
Opheim, 7 miles northwest of; sec. 7, T. 36 N., R. 40 E.; Baldwin Bros. mine, Opheim bed (face of main drift, 150 feet southwest of opening).	.....	*23006	B	1	42.66	23.57	25.05	8.72	.55	6.95	34.51	.59	48.68	33.0	3,132	5,638
				2	.....	41.11	43.68	15.21	.96	3.85	60.19	1.03	18.76	.....	5,462	9,832
				3	.....	48.49	51.51	.....	1.13	4.54	70.99	1.21	22.13	.....	6,442	11,596
8 miles northwest of; sec. 6, T. 36 N., R. 40 E., Dawson mine (face of main drift, 120 feet east of opening).	.....	*23025	B	1	45.86	22.46	24.58	7.10	.29	7.22	33.11	.61	51.67	37.3	3,036	5,465
				2	.....	41.49	45.40	13.11	.54	3.92	61.16	1.13	20.14	.....	5,608	10,094
				3	.....	47.75	52.25	.....	.62	4.51	70.39	1.30	23.18	.....	6,454	11,617
NEW MEXICO.																
COLFAX COUNTY.																
Brilliant; T. 31 N., R. 23 E.; Brilliant mine, Tin Pan bed (1 east entry, 5 main entry, south of Tin Pan Canyon).	.....	17703	B	1	2.59	36.05	45.28	16.08	.56	5.35	67.63	1.56	8.82	.9	6,750	12,150
				2	.....	37.01	46.48	16.51	.57	5.19	69.43	1.60	6.70	.....	6,930	12,474
				3	.....	44.33	55.67	.....	.68	6.22	83.16	1.92	8.02	.....	8,300	14,940
Dawson; secs. 1, 31, and 36, T. 27 N., 28 N., 28 N., R. 20 E., 21 E., and 20 E.; Dawson No. 2 mine, "Raton" bed (face of 16 east entry, 1 and 2 north entries).	.....	18166	A	1	2.24	35.72	48.29	13.75	.68	.....	.....	.....	.....	1.1	6,984	12,571
Same (35 room, 12 west entry, 1 and 2 north entries)	.....	18169	A	1	2.33	35.08	44.60	17.99	.69	.....	.....	.....	.....	.9	6,644	11,959
Same (5 room, 1 south entry, 4 east entry, "Hi" line)	.....	18171	A	1	2.27	38.17	48.79	10.77	.60	.....	.....	.....	.....	.7	7,277	13,099
Same (face of 13 east entry, "Hi" line)	.....	18174	A	1	2.54	37.24	48.38	11.84	.69	.....	.....	.....	.....	1.4	7,148	12,866
Same (face of 1 east entry, 1 south entry, 9 west entry, 1 and 2 north entries).	.....	18175	A	1	2.53	36.86	46.30	14.31	.74	.....	.....	.....	.....	.6	6,990	12,582

Same (composite of samples 18166, 18169, 18171, 18174, and 18175)	.....	18279	A	1	2.42	36.75	47.06	13.77	.65	5.17	69.97	1.37	9.07	.9	7,002	12,604
				2	.....	37.66	48.23	14.11	.67	5.02	71.71	1.40	7.09	.....	7,176	12,917
				3	.....	43.85	56.15	.....	.78	5.84	83.49	1.63	8.26	.....	8,355	15,039
Koehler, Koehler No. 3 mine, Raton bed (71 room, 2 east entry)	.....	17781	B	1	1.97	35.72	49.21	13.10	.78	5.24	70.71	1.32	8.85	.4	7,037	12,667
				2	.....	36.44	50.20	13.36	.80	5.12	72.13	1.35	7.24	.....	7,178	12,920
				3	.....	42.06	57.94	.....	.92	5.91	83.25	1.56	8.36	.....	8,285	14,913
Yankee; Yankee mine, sec. 35, T. 32 N., R. 62 W.; "Yankee" bed (570 feet N. 20° E. of opening).	.....	17746	B	1	5.71	37.37	44.64	12.28	1.09	5.47	66.31	1.40	13.45	1.6	6,654	11,977
				2	.....	39.63	47.35	13.02	1.16	5.13	70.33	1.48	8.88	.....	7,057	12,703
				3	.....	45.56	54.44	.....	1.33	5.90	80.86	1.70	10.21	.....	8,113	14,603
M'KINLEY COUNTY.																
Allison; SE. ¼ SW. ¼ sec. 18, T. 15 N., R. 18 W., Diamond mine, Aztec (?) bed (about 2,600 feet N. 55° W. of shaft).	.....	19217	B	1	15.21	38.06	40.65	6.08	.58	.....	.....	.....	.....	9.3	6,084	10,951
Same (about 1,400 feet S. 85° W. of shaft)	.....	19218	B	1	14.75	35.44	37.98	11.83	.43	.....	.....	.....	.....	9.0	5,641	10,154
Same (about 3,300 feet N. 45° E. of shaft)	.....	19219	B	1	14.28	38.64	40.24	6.84	.40	.....	.....	.....	.....	8.2	6,083	10,949
Same (composite of samples 19217, 19218, and 19219)	.....	19220	B	1	14.76	37.25	39.69	8.30	.50	6.02	60.78	1.07	23.33	8.8	5,946	10,703
				2	.....	43.70	46.56	9.74	.59	5.14	71.31	1.26	11.96	.....	6,976	12,557
				3	.....	48.42	51.58	.....	.65	5.69	79.00	1.40	13.26	.....	7,729	13,912
Gallup, about 1½ miles north of; NW. ¼ NE. ¼ sec. 9, T. 15 N., R. 18 W.; Bartlett mine, Black Diamond (?) bed (about 430 feet south of shaft).	.....	19136	B	1	11.79	38.13	39.68	10.40	.65	5.71	61.57	1.14	20.53	4.6	6,055	10,899
				2	.....	43.23	44.98	11.79	.74	4.99	69.80	1.29	11.39	.....	6,865	12,357
				3	.....	49.01	50.99	.....	.84	5.66	79.13	1.46	12.91	.....	7,783	14,009
1½ miles northwest of; SE. ¼ SW. ¼ sec. 8, T. 15 N., R. 18 W.; Beddow mine, Aztec (?) bed (about 300 feet west of shaft).	.....	19222	B	1	16.17	38.06	40.86	4.91	.61	.....	.....	.....	.....	10.0	6,109	10,996
				2	.....	45.40	48.74	5.86	.73	.....	.....	.....	.....	.....	7,287	13,117
				3	.....	48.22	51.78	.....	.78	.....	.....	.....	.....	.....	7,740	13,932
1¼ miles east of; SE. ¼ SW. ¼ sec. 14, T. 15 N., R. 18 W.; Carreto mine, Otero (?) bed (about 350 feet S. 15° E. of mouth of entry).	.....	19163	B	1	10.58	40.59	44.43	4.40	.59	5.95	68.16	1.11	19.79	3.4	6,723	12,101
				2	.....	45.39	49.69	4.92	.66	5.33	76.22	1.24	11.63	.....	7,518	13,532
				3	.....	47.74	52.26	.....	.69	5.61	80.16	1.30	12.24	.....	7,907	14,233
6 miles west of; SW. ¼ NE. ¼ sec. 16, T. 15 N., R. 19 W.; Defiance mine, Defiance bed (about 830 feet N. 85° E. of mouth of mine).	.....	19223	B	1	10.62	40.87	41.42	7.09	.79	.....	.....	.....	.....	5.9	6,394	11,509
				2	.....	45.73	46.34	7.93	.88	.....	.....	.....	.....	.....	7,154	12,877
				3	.....	49.67	50.33	.....	.96	.....	.....	.....	.....	.....	7,770	13,986
1 mile south of; NE. ¼ SE. ¼ sec. 21, T. 15 N., R. 18 W.; Gallup Southwestern mine, Black Diamond bed (about 1,200 feet south of mine mouth).	.....	19162	B	1	11.39	39.85	42.25	6.51	.75	.....	.....	.....	.....	4.0	6,466	11,639
				2	.....	44.97	47.68	7.35	.85	.....	.....	.....	.....	.....	7,297	13,135
				3	.....	48.54	51.46	.....	.92	.....	.....	.....	.....	.....	7,876	14,177
4 miles northeast of; NW. ¼ sec. 35, T. 16 N., R. 18 W.; Heaton mine, No. 2 bed (about 2,300 feet N. 30° W. of slope mouth).	.....	19286	B	1	14.57	38.80	40.92	5.71	.60	.....	.....	.....	.....	6.7	6,130	11,034
				2	.....	45.42	47.90	6.68	.70	.....	.....	.....	.....	.....	7,175	12,915
				3	.....	48.67	51.33	.....	.75	.....	.....	.....	.....	.....	7,689	13,840
Same, No. 3½ bed (about 3,300 feet N. 15° W. of slope mouth).	.....	19287	B	1	14.96	38.06	43.64	3.34	.53	.....	.....	.....	.....	7.5	6,305	11,349
				2	.....	44.75	51.32	3.93	.62	.....	.....	.....	.....	.....	7,414	13,345
				3	.....	46.58	53.42	.....	.65	.....	.....	.....	.....	.....	7,717	13,891
Same, No. 3 bed (about 4,000 feet N. 37° W. of slope mouth)	.....	19288	B	1	16.04	38.06	41.31	4.59	.85	.....	.....	.....	.....	8.5	6,098	10,976
				2	.....	45.33	49.20	5.47	1.01	.....	.....	.....	.....	.....	7,263	13,073
				3	.....	47.95	52.05	.....	1.07	.....	.....	.....	.....	.....	7,684	13,831
7 miles southwest of; SW. ¼ NW. ¼ sec. 22, T. 15 N., R. 19 W.; Jones mine, Defiance bed (about 250 feet north of mouth of mine).	.....	19221	B	1	15.40	38.15	41.34	5.11	.92	6.25	62.95	1.13	23.64	10.6	6,184	11,131
				2	.....	45.09	48.87	6.04	1.09	5.37	74.40	1.34	11.75	.....	7,309	13,156
				3	.....	47.99	52.01	.....	1.16	5.72	79.18	1.43	12.51	.....	7,779	14,002
8 miles west of; SE. ¼ sec. 21, T. 15 N., R. 19 W.; Myers mine, Myers bed (about 205 feet N. 45° W. of opening).	.....	19213	B	1	12.71	36.46	43.36	7.47	.72	5.78	64.18	1.10	20.75	7.6	6,239	11,230
				2	.....	41.77	49.67	8.56	.82	5.01	73.52	1.26	10.83	.....	7,147	12,865
				3	.....	45.68	54.32	.....	.90	5.48	80.40	1.38	11.84	.....	7,816	14,069
3 miles north of; SW. ¼ SE. ¼ sec. 33, T. 16 N., R. 18 W.; Navajo mine, No. 1 bed (about 1,400 feet N. 21° W. of mouth of old slope).	.....	19131	B	1	12.55	38.86	39.42	9.17	.43	5.89	60.85	1.09	22.57	4.8	6,002	10,804
				2	.....	44.44	45.07	10.49	.49	5.15	69.58	1.25	13.04	.....	6,863	12,353
				3	.....	49.65	50.35	.....	.55	5.75	77.73	1.40	14.57	.....	7,667	13,801

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
NEW MEXICO—Continued.																
M'KINLEY COUNTY—continued.																
Gallup, 3 miles north of; SW. ¼ SE. ¼ sec. 33, T. 16 N., R. 18 W.; Navajo mine, No. 2 bed (about 2,300 feet N. 21° W. of mouth of old slope).	.....	19132	B	1	14.05	39.74	42.21	4.00	0.58	6.13	64.15	1.16	23.98	5.7	6,288	11,315
				2	.....	46.24	49.11	4.65	.67	5.32	74.64	1.35	13.37	.....	7,314	13,165
				3	.....	48.50	51.50	.....	.70	5.58	78.28	1.42	14.02	.....	7,671	13,808
Same, No. 5 bed (about 2,500 feet N. 2° W. of mouth of 5 slope).	.....	19133	B	1	14.00	39.50	41.10	5.40	.49	.....	.....	.....	.....	6.1	6,258	11,264
Same (about 1,300 feet N. 55° W. of mouth of 5 slope)	.....	19134	B	1	12.42	39.06	39.48	9.04	.44	.....	.....	.....	.....	5.3	6,099	10,978
Same (composite of samples 19133 and 19134)	.....	19135	B	1	13.19	39.14	40.46	7.21	.45	6.04	62.73	1.13	22.44	5.7	6,165	11,097
				2	.....	45.09	46.60	8.31	.52	5.26	72.26	1.30	12.35	.....	7,101	12,782
				3	.....	49.18	50.82	.....	.57	5.74	78.81	1.42	13.46	.....	7,744	13,939
Gibson; SW. ¼ NE. ¼ sec. 34, T. 16 N., R. 18 W.; Weaver mine, No. 2 bed (about 3,900 feet N. 6° W. of mine mouth).	.....	19137	B	1	14.06	39.19	41.90	4.85	.49	.....	.....	.....	.....	5.5	6,280	11,304
				2	.....	45.60	48.76	5.64	.57	.....	.....	.....	.....	.....	7,307	13,153
				3	.....	48.33	51.67	.....	.60	.....	.....	.....	.....	.....	7,744	13,939
Same, No. 3 bed (about 3,450 feet N. 12° W. of pit mouth)	.....	19138	B	1	15.82	37.98	43.06	3.14	.45	6.28	64.08	1.11	24.94	6.4	6,282	11,308
				2	.....	45.12	51.15	3.73	.53	5.37	76.12	1.32	12.93	.....	7,462	13,432
				3	.....	46.87	53.13	.....	.55	5.58	79.07	1.37	13.43	.....	7,751	13,952
Same, No. 3½ bed (about 2,750 feet N. 2° W. of mine mouth)	.....	19139	B	1	13.50	37.75	42.51	6.24	.36	5.95	63.37	1.10	22.98	5.5	6,189	11,140
				2	.....	43.64	49.15	7.21	.42	5.14	73.26	1.27	12.70	.....	7,155	12,879
				3	.....	47.03	52.97	.....	.45	5.54	78.95	1.37	13.69	.....	7,711	13,880
Same, No. 5 bed (about 2,800 feet N. 42° W. of mine mouth)	.....	19140	B	1	13.93	38.95	40.63	6.49	.47	.....	.....	.....	.....	5.7	6,164	11,095
				2	.....	45.25	47.21	7.54	.55	.....	.....	.....	.....	.....	7,161	12,890
				3	.....	48.94	51.06	.....	.59	.....	.....	.....	.....	.....	7,745	13,941
SAN JUAN COUNTY.																
Durango, Colo., about 28½ miles southwest of; sec. 22, T. 32 N., R. 12 W.; New Mexico mine, "A" bed (about 75 feet east of opening).	.....	17749	B	1	6.63	35.38	44.86	13.13	.66	.....	.....	.....	.....	1.6	6,381	11,486
				2	.....	37.89	48.05	14.06	.71	.....	.....	.....	.....	.....	6,834	12,301
				3	.....	44.09	55.91	.....	.83	.....	.....	.....	.....	.....	7,952	14,314
Farmington, about 20 miles northwest of; sec. 21, T. 30 N., R. 16 W., Government mine, "Hogback" bed, (about 100 feet southeast of the south opening).	.....	17750	B	1	10.59	36.74	49.58	3.09	.64	.....	.....	.....	.....	1.8	6,114	11,005
				2	.....	41.09	55.45	3.46	.72	.....	.....	.....	.....	.....	6,838	12,308
				3	.....	42.56	57.44	.....	.75	.....	.....	.....	.....	.....	7,083	12,749

30 miles south of; sec. 31, T. 24 N., R. 13 W.; prospect, Carbonero (?) bed (open pit).	.....	*22807	B	1	19.14	32.95	41.70	6.21	.43	.....	.....	.....	.....	5.8	5,658	10,184
				2	.....	40.75	51.57	7.68	.53	.....	.....	.....	.....	.....	6,997	12,595
				3	.....	44.14	55.86	.....	.57	.....	.....	.....	.....	.....	7,579	13,642
35 miles southwest of; local mine (wall of open pit)	.....	22685	B	1	16.09	36.19	40.72	7.00	.69	.....	.....	.....	.....	6.1	5,857	10,543
				2	.....	43.13	48.53	8.34	.82	.....	.....	.....	.....	.....	6,980	12,564
				3	.....	47.05	52.95	.....	.89	.....	.....	.....	.....	.....	7,615	13,707
50 miles south of; Blake mine, T. 22 N., R. 13 W. (40 feet north of opening).	.....	*23003	B	1	19.01	32.43	43.15	5.41	.92	.....	.....	.....	.....	11.2	5,663	10,193
				2	.....	40.04	53.28	6.68	1.14	.....	.....	.....	.....	.....	6,992	12,586
				3	.....	42.91	57.09	.....	1.22	.....	.....	.....	.....	.....	7,493	13,487
Fruitland, near; T. 29 N., R. 15 W.; Black Diamond mine, Carbonero bed (25 feet north of mine mouth).	.....	22508	B	1	11.58	38.59	39.94	9.89	.60	.....	.....	.....	.....	6.2	6,106	10,991
				2	.....	43.65	45.16	11.19	.68	.....	.....	.....	.....	.....	6,906	12,431
				3	.....	49.15	50.85	.....	.77	.....	.....	.....	.....	.....	7,776	13,997
Same; T. 29 N., R. 15 W.; Henderickson mine, Carbonero bed (open pit).	.....	22509	B	1	10.49	38.55	41.71	9.25	.60	.....	.....	.....	.....	5.1	6,230	11,214
				2	.....	43.07	46.60	10.33	.67	.....	.....	.....	.....	.....	6,960	12,528
				3	.....	48.03	51.97	.....	.75	.....	.....	.....	.....	.....	7,762	13,972
Pueblo Bonita, near; sec. 14, T. 20 N., R. 11 W.; Pueblo Bonita mine (50 feet south of mine mouth).	.....	*23004	B	1	14.36	34.82	43.30	7.52	1.54	.....	.....	.....	.....	7.1	5,679	10,222
				2	.....	40.66	50.56	8.78	1.80	.....	.....	.....	.....	.....	6,631	11,936
				3	.....	44.58	55.42	.....	1.97	.....	.....	.....	.....	.....	7,270	13,086
SOCORRO COUNTY.																
Magdalena, 20 miles northwest of; sec. 18, T. 1 N., R. 5 W.; prospect (end of entry, 30 feet from opening).	.....	17602	B	1	6.48	34.51	51.92	7.09	.50	5.32	69.35	1.17	16.57	1.3	6,662	11,992
				2	.....	36.90	55.52	7.58	.53	4.92	74.16	1.25	11.56	.....	7,124	12,823
				3	.....	39.93	60.07	.....	.57	5.32	80.24	1.35	12.52	.....	7,708	13,874
65 miles northwest of; SW. ¼ sec. 20, T. 3 N., R. 9 W.; prospect (end of prospect, 8 feet from opening).	.....	*17728	B	1	18.47	31.70	39.02	10.81	.43	.....	.....	.....	.....	6.7	4,712	8,482
				2	.....	38.88	47.86	13.26	.53	.....	.....	.....	.....	.....	5,779	10,402
				3	.....	44.82	55.18	.....	.61	.....	.....	.....	.....	.....	6,663	11,993
32 miles northwest of; sec. 8, T. 2 N., R. 6 W.; prospect (end of drift, 15 feet from opening).	.....	*20007	B	1	25.91	30.29	34.73	9.07	.39	5.65	46.45	.91	37.53	18.5	4,127	7,429
				2	.....	40.88	46.88	12.24	.53	3.74	62.69	1.23	19.57	.....	5,570	10,026
				3	.....	46.58	53.42	.....	.60	4.26	71.44	1.40	22.30	.....	6,347	11,425
NORTH DAKOTA.																
MORTON COUNTY.																
Almont, 5 miles southwest of; sec. 6, T. 137 N., R. 86 W.; Ramsland mine (south wall of open pit).	.....	*19786	B	1	36.10	27.68	30.36	5.86	.41	.....	.....	.....	.....	24.9	3,877	6,979
				2	.....	43.32	47.51	9.17	.64	.....	.....	.....	.....	.....	6,067	10,921
				3	.....	47.70	52.30	.....	.70	.....	.....	.....	.....	.....	6,680	12,024
Leith, 1½ miles southwest of; sec. 7, T. 133 N., R. 87 W.; Kolbank mine (1 room, east of main entry, 70 feet south of opening).	.....	*17537	B	1	34.72	29.83	24.92	10.53	1.50	.....	.....	.....	.....	16.6	3,776	6,797
				2	.....	45.70	38.17	16.13	2.30	.....	.....	.....	.....	.....	5,784	10,411
				3	.....	54.49	45.51	.....	2.74	.....	.....	.....	.....	.....	6,896	12,413
New Salem, ½ mile northeast of; sec. 15, T. 139 N., R. 85 W.; Dakota Products mine (2,040 feet northwest of opening).	.....	*20033	B	1	38.52	27.60	26.60	7.28	1.31	7.03	39.22	.60	44.56	32.7	3,724	6,703
				2	.....	44.89	43.27	11.84	2.13	4.47	63.79	.98	16.79	.....	6,057	10,903
				3	.....	50.92	49.08	.....	2.42	5.07	72.36	1.11	19.04	.....	6,870	12,366
10 miles southeast of; sec. 32, T. 138 N., R. 84 W.; outcrop of lignite (70 feet N. 15° W. of shaft opening).	.....	*19801	B	1	38.58	26.81	26.73	7.88	.66	.....	.....	.....	.....	31.5	3,584	6,451
				2	.....	43.65	43.52	12.83	1.07	.....	.....	.....	.....	.....	5,835	10,503
				3	.....	50.08	49.92	.....	1.23	.....	.....	.....	.....	.....	6,694	12,049
WILLIAMS COUNTY.																
Williston, 1½ miles east of; sec. 17, T. 155 N., R. 100 W.; Husebye-Ellithorpe mine, top vein (face of 2 west entry, 200 feet from shaft).	.....	*19370	A	1	43.83	24.40	26.51	5.26	.40	.....	.....	.....	.....	32.8	.....	.....
Same (face of 1 room, 2 west entry)	.....	*19371	A	1	42.43	24.04	28.09	5.44	.82	.....	.....	.....	.....	31.4	.....	.....
Same (composite of samples 19370 and 19371)	.....	*19372	A	1	43.03	24.44	27.06	5.47	.60	7.41	37.43	.67	48.42	32.1	3,487	6,277
				2	.....	42.90	47.50	9.60	1.05	4.62	65.70	1.18	17.85	.....	6,121	11,018
				3	.....	47.46	52.54	.....	1.16	5.11	72.68	1.31	19.74	.....	6,771	12,188

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
NORTH DAKOTA—Continued.																
WILLIAMS COUNTY—continued.																
Williston, 1½ miles east of; sec. 17, T. 155 N., R. 100 W.; Huseby-Ellithorpe mine, top vein (3 room, 2 north entry).	.....	*19917	A	1	40.78	23.03	25.66	10.53	2.39	.....	.....	.....	.....	33.3	3,291	5,924
				2	.....	38.89	43.33	17.78	4.04	.....	.....	.....	.....	.....	5,557	10,003
				3	.....	47.30	52.70	.....	4.91	.....	.....	.....	.....	.....	6,758	12,164
Same (1 room, 2 north entry)	.....	*19918	A	1	42.72	24.87	26.46	5.95	.65	7.32	36.86	0.64	48.58	33.4	3,451	6,212
				2	.....	43.42	46.19	10.39	1.13	4.49	64.35	1.12	18.52	.....	6,025	10,845
				3	.....	48.45	51.55	.....	1.26	5.01	71.81	1.25	20.67	.....	6,723	12,101
3 miles northeast of; SE. ¼ NE. ¼, sec. 7, T. 155 N., R. 100 W.; U. S. Reclamation Service mine, middle vein (face 3 south room, main west entry).	.....	*19365	A	1	45.25	23.28	26.02	5.45	.67	.....	.....	.....	.....	33.4	.....	.....
Same (face of main west entry)	.....	*19366	A	1	43.06	24.33	26.42	6.19	.50	.....	.....	.....	.....	32.2	.....	.....
Same (composite of samples 19365 and 19366)	.....	*19367	A	1	44.17	23.79	26.28	5.76	.56	7.28	36.11	.63	49.66	32.8	3,353	6,035
				2	.....	42.61	47.07	10.32	1.00	4.25	64.68	1.13	18.62	.....	6,006	10,811
				3	.....	47.51	52.49	.....	1.12	4.74	72.11	1.26	20.77	.....	6,697	12,055
Same (face of 3 north entry, main west entry)	.....	*19921	A	1	44.62	24.25	26.48	4.65	.43	7.41	36.37	.58	50.56	36.7	3,398	6,116
				2	.....	43.79	47.81	8.40	.78	4.42	65.67	1.05	19.68	.....	6,136	11,045
				3	.....	47.81	52.19	.....	.85	4.83	71.69	1.15	21.48	.....	6,699	12,058
Same (left rib, main west entry, near 2 stub entry)	.....	*19922	A	1	40.37	25.98	26.89	6.76	.68	6.98	37.57	.65	47.36	31.3	3,477	6,259
				2	.....	43.57	45.09	11.34	1.14	4.18	63.00	1.09	19.25	.....	5,831	10,496
				3	.....	49.14	50.86	.....	1.29	4.71	71.06	1.23	21.71	.....	6,577	11,839
OHIO.																
BELMONT COUNTY.																
Alledonia, 1½ miles southwest of; sec. 33, T. 5 N., R. 4 W.; S. A. Moore mine, Washington bed (50 feet east of opening).	.....	20238	B	1	4.08	33.69	41.23	21.00	2.86	4.76	59.93	1.09	10.36	2.3	6,012	10,822
				2	.....	35.12	42.98	21.90	2.98	4.49	62.48	1.14	7.01	.....	6,268	11,282
				3	.....	44.97	55.03	.....	3.82	5.75	80.00	1.46	8.97	.....	8,026	14,447
1 mile north of; sec. 22, T. 5 N., R. 4 W.; Shipman Bros., mine, Meigs Creek (Sewickley) bed (40 feet west of opening).	.....	20237	B	1	3.51	37.15	41.53	17.81	4.05	.....	.....	.....	.....	1.6	6,396	11,513
				2	.....	38.50	43.04	18.46	4.20	.....	.....	.....	.....	.....	6,629	11,932

			3	.....	47.22	52.78	.....	5.15	.....	.....	.....	.....	.....	8,130	14,634
1 mile southwest of; sec. 27, T. 5 N., R. 4 W.; Stoffel mine, Waynesburg bed (50 feet southwest of opening).	.....	20236	B	1	4.57	36.81	44.17	14.45	2.59	.....	.....	.....	.....	2.4	6,574	11,833
				2	.....	38.57	46.29	15.14	2.71	.....	.....	.....	.....	.....	6,889	12,400
				3	.....	45.45	54.55	.....	3.19	.....	.....	.....	.....	.....	8,118	14,612
Baileys Mills; 3½ miles southwest of Barnesville; sec. 31, T. 8 N., R. 6 W.; Cochran No. 2 mine, Pittsburgh bed (face, main north entry, 1 mile north of entrance).	.....	20187	B	1	4.13	42.71	43.83	9.33	4.46	.....	.....	.....	.....	2.3	7,074	12,733
Same (6 room, 15 west entry, ¾ mile north of entrance)	.....	20188	B	1	3.72	43.25	44.40	8.63	4.45	.....	.....	.....	.....	1.7	7,193	12,947
Same (composite of samples 20187 and 20188)	.....	20189	B	1	3.88	43.09	43.96	9.07	4.36	5.46	69.97	1.27	9.87	2.0	7,132	12,838
				2	.....	44.83	45.73	9.44	4.54	5.23	72.80	1.32	6.67	.....	7,420	13,356
				3	.....	49.50	50.50	.....	5.01	5.77	80.39	1.46	7.37	.....	8,193	14,747
Barnesville, 1 mile southwest of; sec. 20, T. 8 N., R. 6 W.; Thomas Davy mine, Meigs Creek (Sewickley) bed (350 feet southwest of mine mouth).	.....	20176	B	1	4.34	38.95	45.50	11.21	3.65	5.31	68.17	1.20	10.46	2.4	6,890	12,402
				2	.....	40.72	47.56	11.72	3.82	5.05	71.26	1.25	6.90	.....	7,203	12,965
				3	.....	46.13	53.87	.....	4.33	5.72	80.72	1.42	7.81	.....	8,160	14,688
Boston, 2 miles east of; sec. 14, T. 7 N., R. 6 W.; George Thomas mine, Waynesburg bed (200 feet south of mine mouth).	.....	20241	B	1	4.46	36.60	44.19	14.75	3.02	5.10	65.32	1.16	10.65	2.5	6,553	11,795
				2	.....	38.31	46.25	15.44	3.16	4.81	68.37	1.21	7.01	.....	6,859	12,346
				3	.....	45.31	54.69	.....	3.74	5.69	80.85	1.43	8.29	.....	8,111	14,600
Hunter, 1½ miles northeast of; sec. 7, T. 7 N., R. 5 W.; Milhoan mine, Waynesburg bed (50 feet south of mine mouth).	.....	20174	B	1	4.31	35.32	44.15	16.22	3.53	4.98	64.10	1.20	9.97	2.2	6,447	11,605
				2	.....	36.91	46.14	16.95	3.69	4.70	66.98	1.25	6.43	.....	6,737	12,127
				3	.....	44.44	55.56	.....	4.44	5.66	80.65	1.51	7.74	.....	8,112	14,602
2 miles east of; sec. 1, T. 7 N., R. 5 W.; Peter Kemp prospect, Uniontown bed (20 feet west of opening).	.....	20775	B	1	4.70	34.21	45.75	15.34	2.85	4.95	63.71	1.33	11.82	2.6	6,479	11,662
				2	.....	35.90	48.00	16.10	2.99	4.65	66.85	1.40	8.01	.....	6,799	12,238
				3	.....	42.79	57.21	.....	3.56	5.54	79.68	1.67	9.55	.....	8,104	14,587
Somerton, 2 miles southeast of; sec. 26, T. 6 N., R. 5 W.; Howard Brown mine, Waynesburg bed (100 feet west of mine mouth).	.....	20234	B	1	4.40	37.10	43.06	15.44	2.90	.....	.....	.....	.....	2.3	6,476	11,657
				2	.....	38.81	45.04	16.15	3.03	.....	.....	.....	.....	.....	6,774	12,193
				3	.....	46.28	53.72	.....	3.61	.....	.....	.....	.....	.....	8,079	14,542
Temperanceville; sec. 33, T. 7 N., R. 6 W.; Jefferies mine, Pittsburgh bed (600 feet north of opening).	.....	20230	B	1	3.72	41.01	45.78	9.49	4.57	.....	.....	.....	.....	2.0	7,089	12,760
				2	.....	42.59	47.55	9.86	4.75	.....	.....	.....	.....	.....	7,363	13,253
				3	.....	47.25	52.75	.....	5.27	.....	.....	.....	.....	.....	8,169	14,704
GUERNSEY COUNTY.																
Hartford, 1 mile southeast of; sec. 11, T. 8 N., R. 9 W.; Andy Slovak mine, Anderson (Bakerstown) bed (75 feet east of opening).	.....	20243	B	1	4.33	40.21	45.07	10.39	3.75	5.37	68.30	1.50	10.69	2.5	6,940	12,492
				2	.....	42.03	47.11	10.86	3.92	5.11	71.39	1.57	7.15	.....	7,254	13,057
				3	.....	47.15	52.85	.....	4.40	5.73	80.09	1.76	8.02	.....	8,138	14,648
1 mile southeast of; sec. 11, T. 8 N., R. 9 W., Waldhonding No. 2 mine, Upper Freeport bed (600 feet southeast of shaft).	.....	20245	B	1	6.88	34.07	53.30	5.75	.84	.....	.....	.....	.....	4.2	7,104	12,787
Same (3,400 feet northwest of shaft)	.....	20246	B	1	6.25	36.16	52.29	5.30	.88	.....	.....	.....	.....	3.6	7,224	13,003
Same (composite of samples 20245 and 20246)	.....	20247	B	1	6.49	35.41	52.57	5.53	.88	5.49	73.41	1.37	13.32	3.9	7,189	12,940
				2	.....	37.87	56.22	5.91	.94	5.10	78.50	1.47	8.08	.....	7,688	13,838
				3	.....	40.25	59.75	.....	1.00	5.42	83.43	1.56	8.59	.....	8,171	14,708
Lore City, 1 mile west of; sec. 8, T. 1 N., R. 2 W.; Black Top mine, Upper Freeport bed (23 east entry, main south entry, 6,200 feet S. 15° E. of shaft).	.....	20264	B	1	6.09	35.22	51.76	6.93	1.62	.....	.....	.....	.....	3.8	7,077	12,739
Same (near end of main south entry, 7,300 feet S. 12° W. of shaft).	.....	20265	B	1	5.95	35.73	50.37	7.95	2.15	.....	.....	.....	.....	3.4	7,034	12,661
Same (composite of samples 20264 and 20265)	.....	20266	B	1	6.07	35.04	51.56	7.33	1.95	5.37	71.24	1.39	12.72	3.6	7,062	12,712
				2	.....	37.30	54.90	7.80	2.08	5.00	75.84	1.48	7.80	.....	7,518	13,532
				3	.....	40.46	59.54	.....	2.26	5.42	82.26	1.61	8.45	.....	8,154	14,677
Quaker City, 1½ miles northwest of; sec. 21, T. 9 N., R. 7 W.; Samuel Sayre mine, Pittsburgh bed (250 feet east of mine mouth).	.....	20178	B	1	4.36	41.14	45.76	8.74	4.85	5.37	69.30	1.26	10.48	2.2	7,061	12,710
				2	.....	43.02	47.84	9.14	5.07	5.11	72.46	1.32	6.90	.....	7,383	13,289
				3	.....	47.35	52.65	.....	5.58	5.62	79.75	1.45	7.60	.....	8,126	14,627

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
OHIO—Continued.																
GUERNSEY COUNTY—continued.																
Senecaville; ¼ mile southeast of; sec. 21, T. 1 N., R. 2 W.; Cleveland mine, Upper Freeport bed (room 5) east entry, main north entry, (5,000 feet east of shaft).	.....	20261	B	1	5.37	35.80	50.78	8.05	1.64	.....	.....	.....	.....	3.2	7,102	12,784
Same (3 north entry, 10,500 feet north of shaft)	.....	20262	B	1	6.38	33.67	52.14	7.81	2.16	.....	.....	.....	.....	4.1	7,015	12,627
Same (composite of samples 20261 and 20262)	.....	20263	B	1	6.00	34.22	51.95	7.83	1.98	5.38	71.38	1.32	12.11	3.7	7,067	12,721
				2	.....	36.40	55.27	8.33	2.11	5.01	75.93	1.40	7.22	.....	7,518	13,532
				3	.....	39.71	60.29	.....	2.30	5.47	82.83	1.53	7.87	.....	8,201	14,762
MONROE COUNTY.																
Coats Station, 2½ miles east of; sec. 31, T. 4 N., R. 4 W.; Charles Mobley mine, Uniontown bed (40 feet east of mine mouth).	.....	20259	B	1	4.85	35.93	43.90	15.32	3.96	4.87	63.59	1.19	11.07	2.7	6,412	11,542
				2	.....	37.76	46.14	16.10	4.16	4.55	66.83	1.25	7.11	.....	6,739	12,130
				3	.....	45.01	54.99	.....	4.96	5.42	79.65	1.49	8.48	.....	8,032	14,458
NOBLE COUNTY.																
Mount Ephraim Station, 1 mile north of; sec. 33, T. 8 N., R. 8 W.; Wiley Carter mine, Meigs Creek (Sewickley) bed (room 300 feet west of mine mouth).	.....	20235	B	1	4.53	39.56	45.59	10.32	4.12	5.27	68.00	1.17	11.12	2.4	6,846	12,323
				2	.....	41.44	47.75	10.81	4.32	5.00	71.22	1.23	7.42	.....	7,171	12,908
				3	.....	46.46	53.54	.....	4.84	5.61	79.85	1.38	8.32	.....	8,040	14,472
Quaker City, 3 miles southeast of; sec. 11, T. 8 N., R. 7 W.; G. W. Griffin mine, Meigs Creek (Sewickley) bed (350 feet west of mine mouth).	.....	20185	B	1	4.14	38.42	44.82	12.62	3.61	5.22	66.87	1.20	10.48	2.1	6,739	12,130
				2	.....	40.08	46.75	13.17	3.77	4.97	69.76	1.25	7.08	.....	7,030	12,654
				3	.....	46.16	53.84	.....	4.34	5.72	80.34	1.44	8.16	.....	8,096	14,573
Steamtown, 1 mile west of; sec. 11, T. 7 N., R. 8 W.; J. T. Moore mine, Meigs Creek (Sewickley) bed (480 feet south of mine mouth).	.....	20240	B	1	3.57	41.53	44.37	10.53	4.87	5.25	68.15	1.11	10.09	1.9	6,947	12,505
				2	.....	43.07	46.01	10.92	5.05	5.03	70.67	1.15	7.18	.....	7,204	12,967
				3	.....	48.35	51.65	.....	5.67	5.65	79.33	1.29	8.06	.....	8,087	14,557
OKLAHOMA.																
CRAIG COUNTY.																
Bluejacket, 4 miles west of; sec. 26, T. 27 N., R. 20 E.; James Coates mine (off east side of main entry, 300 feet from mouth).	.....	20716	B	1	4.14	37.41	48.28	10.17	6.08	5.33	69.76	1.39	7.27	2.5	7,175	12,915
				2	.....	39.03	50.36	10.61	6.34	5.08	72.77	1.45	3.75	.....	7,485	13,473
				3	.....	43.66	56.34	.....	7.09	5.68	81.41	1.62	4.20	.....	8,373	15,071

Estella, 1 mile east of; sec. 33, T. 26 N., R. 19 E.; William Boot strip pit (face of pit).	20718	B	1	5.75	38.26	45.92	10.07	6.02					4.1	6,982	12,568
			2		40.59	48.73	10.68	6.39						7,408	13,334
			3		45.44	54.56		7.15						8,294	14,929
Vinita, 10 miles northwest of; sec. 13, T. 26 N., R. 19 E.; Heldebrand strip pit.	20717	B	1	4.09	40.35	45.48	10.08	6.55					2.4	7,172	12,910
			2		42.07	47.42	10.51	6.83						7,478	13,460
			3		47.01	52.99		7.63						8,356	15,041
Welch, 4 miles west of; sec. 28, T. 28 N., R. 20 E.; J. A. Mills strip pit (face of pit).	20715	B	1	4.89	35.34	48.04	11.73	5.76					2.9	6,934	12,481
			2		37.16	50.51	12.33	6.06						7,290	13,122
			3		42.38	57.62		6.91						8,315	14,967
HASKELL COUNTY.															
Stigler, 1 mile northeast of; Turner Bros. strip pit, Stigler bed	17646	A	1	1.46	27.56	67.04	3.94	.63					.3	8,173	14,711
			2		27.97	68.03	4.00	.64						8,294	14,929
			3		29.14	70.86		.67						8,640	15,552
LATIMER COUNTY.															
Adamson, 3 miles east of; Adamson No. 6 mine, Lower Hartshorne or Lower Wilburton bed (face of 2 west entry, 460 feet northeast of opening).	19852	A	1	12.08	33.04	52.07	2.81	1.12					10.3	7,183	12,929
Same (face of 2 east entry, 400 feet northeast of opening)	19853	A	1	8.49	33.92	54.65	2.94	1.36					6.4	7,434	13,381
Same (composite of samples 19852 and 19853)	19854	A	1	10.20	33.98	52.93	2.89	1.28	6.03	73.56	1.82	14.42	8.4	7,327	13,189
			2		37.84	58.94	3.22	1.43	5.46	81.92	2.03	5.94		8,159	14,686
			3		39.10	60.90		1.48	5.64	84.65	2.10	6.13		8,431	15,179
LE FLORE COUNTY.															
Williams, 1 mile west of; Williams No. 1 mine, Lower Hartshorne bed (face of 2 room, main slope, 1,500 feet of southeast of entrance).	19673	A	1	2.18	16.09	71.44	10.29	1.34					1.5	7,577	13,639
Same (face of 25 room, 6 west entry, 1,500 feet south of opening)	19674	A	1	2.38	16.79	72.94	7.89	.86					1.9	7,744	13,939
Same (face of 2 room, 5 east entry, 1,100 feet southeast of entrance)	19675	A	1	2.69	16.51	73.15	7.65	.73					2.1	7,741	13,934
Same (face of 35 room, 5 west entry, 1,500 feet southwest of slope mouth).	19676	A	1	2.64	16.26	74.03	7.07	.93					2.1	7,823	14,081
Same (face of 7 room, 2 east entry, 250 feet from slope and 550 feet from drift mouth).	19677	A	1	3.09	16.28	70.41	10.22	1.11					2.6	7,465	13,437
Same (composite of samples 19673, 19674, 19675, 19676, and 19677)	19678	A	1	2.63	16.48	72.22	8.67	1.00	4.25	80.06	1.72	4.30	2.0	7,666	13,799
			2		16.92	74.18	8.90	1.03	4.07	82.22	1.77	2.01		7,873	14,171
			3		18.57	81.43		1.13	4.47	90.25	1.94	2.21		8,642	15,556
PITTSBURG COUNTY.															
Adamson, ¼ mile south of; Adamson No. 4 mine, Lower Hartshorne bed (face of 9 east entry, 1,200 feet northeast of opening).	19855	A	1	3.66	35.66	54.10	6.58	.92					2.2	7,531	13,556
Same (face of 10 east entry, 1,250 feet northeast of opening)	19856	A	1	3.88	34.98	55.48	5.66	.63					2.4	7,648	13,766
Same (face of 10 west entry, 1,300 feet northwest of opening)	19857	A	1	5.49	35.60	52.74	6.17	.89					4.1	7,447	13,405
Same (composite of samples 19855, 19856, and 19857)	19858	A	1	4.33	35.51	54.04	6.12	.84	5.46	75.81	1.86	9.91	2.9	7,541	13,574
			2		37.12	56.48	6.40	.88	5.21	79.24	1.94	6.33		7,883	14,189
			3		39.66	60.34		.94	5.57	84.66	2.07	6.76		8,422	15,160
Hartshorne, 1 mile northwest of; sec. 31, T. 5 N., R. 17 E.; Rock Island No. 8 mine, Lower Hartshorne bed (1,800 feet northwest of shaft).	19703	A	1	5.14	37.59	51.20	6.07	1.98					3.6	7,400	13,320
			2		39.63	53.97	6.40	2.09						7,801	14,042
			3		42.34	57.66		2.23						8,335	15,003
Same (2,000 feet northeast of shaft)	19707	A	1	3.69	38.03	50.90	7.38	2.63					2.0	7,386	13,295
			2		39.49	52.85	7.66	2.73						7,669	13,804
			3		42.77	57.23		2.96						8,306	14,951
Same (2,300 feet northeast of shaft)	19708	A	1	3.86	37.84	52.08	6.22	1.66					2.1	7,498	13,496
			2		39.36	54.17	6.47	1.73						7,799	14,038
			3		42.08	57.92		1.85						8,339	15,010

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
OKLAHOMA—Continued.																
PITTSBURG COUNTY—continued.																
Pocahontas; Pocahontas No. 1 mine, Lower Hartshorne bed (face of 8 west entry, 1,650 feet southwest of opening).	.....	19727	A	1	3.74	37.58	53.73	4.95	0.67	.....	.....	.....	.....	2.1	7,671	13,808
Same (face of 6 room, 7 east entry, 1,350 feet southwest of opening)	.....	19728	A	1	3.66	37.81	53.60	4.93	.78	.....	.....	.....	.....	2.0	7,675	13,815
Same (face of 12 room, 8 east entry, 1,850 feet southeast of opening)	.....	19729	A	1	3.39	38.84	51.86	5.91	.84	.....	.....	.....	.....	1.8	7,608	13,694
Same (face of 10 room, 7 east entry, 1,700 feet southeast of opening)	.....	19730	A	1	3.10	38.36	48.42	10.12	2.13	.....	.....	.....	.....	1.6	7,214	12,985
Same (face of main slope, 1,800 feet south of opening)	.....	19731	A	1	3.49	37.94	52.18	6.39	1.70	.....	.....	.....	.....	2.0	7,578	13,640
Same (composite of samples 19727, 19728, 19729, 19730, and 19731).	.....	19732	A	1	3.53	38.20	51.74	6.53	1.22	5.40	75.73	2.03	9.09	1.9	7,533	13,559
				2	.....	39.60	53.63	6.77	1.26	5.20	78.50	2.10	6.17	.....	7,809	14,056
				3	.....	42.47	57.53	.....	1.35	5.58	84.20	2.25	6.62	.....	8,376	15,077
ROGERS COUNTY.																
Catale, 1 mile northeast of; sec. 14, T. 24 N., R. 18 E.; Catale No. 1 mine (300 feet northwest of shaft).	.....	20780	B	1	4.23	38.20	47.75	9.82	5.17	5.35	69.67	1.60	8.39	2.6	7,173	12,911
				2	.....	39.89	49.86	10.25	5.40	5.10	72.75	1.67	4.83	.....	7,490	13,482
				3	.....	44.45	55.55	.....	6.02	5.68	81.06	1.86	5.38	.....	8,345	15,021
Claremore, 5 miles northeast of; sec. 22, T. 22 N., R. 16 E.; McNutt mine (50 feet north of slope mouth).	.....	20781	B	1	9.39	31.68	54.31	4.62	.81	.....	.....	.....	.....	7.3	7,152	12,874
				2	.....	34.96	59.94	5.10	.89	.....	.....	.....	.....	.....	7,893	14,207
				3	.....	36.84	63.16	.....	.94	.....	.....	.....	.....	.....	8,317	14,971
Collinsville, ½ mile north of; sec. 21, T. 22 N., R. 14 E.; New State strip pit, Dawson bed (face of pit).	.....	20714	B	1	6.06	38.35	47.39	8.20	3.84	.....	.....	.....	.....	3.8	7,076	12,737
				2	.....	40.82	50.45	8.73	4.09	.....	.....	.....	.....	.....	7,532	13,558
				3	.....	44.73	55.27	.....	4.48	.....	.....	.....	.....	.....	8,253	14,855
TULSA COUNTY.																
Dawson, ½ mile west of; sec. 28, T. 20 N., R. 13 E.; Southwestern No. 1 mine, Dawson bed (500 feet north of slope mouth).	.....	20712	B	1	6.71	36.30	48.26	8.73	3.38	.....	.....	.....	.....	3.3	6,969	12,544
				2	.....	38.91	51.73	9.36	3.62	.....	.....	.....	.....	.....	7,470	13,446
				3	.....	42.93	57.07	.....	3.99	.....	.....	.....	.....	.....	8,242	14,836
Tulsa, south of; SW. ¼ SE. ¼ sec. 30, T. 18 N., R. 12 E. (material found while drilling oil well).	.....	18247	A	1	1.55	39.85	49.45	9.15	3.78	5.27	74.16	1.78	5.86	.....	7,597	13,674
				2	.....	40.48	50.23	9.29	3.84	5.18	75.32	1.81	4.56	.....	7,716	13,889
				3	.....	44.63	55.37	.....	4.23	5.71	83.03	2.00	5.03	.....	8,506	15,311

4 miles southeast of; sec. 17, T. 19 N., R. 13 E.; Hickory No. 2 mine, Dawson bed (300 feet southeast of shaft).	.....	20713	B	1	6.29	37.71	47.80	8.20	3.76	5.61	69.54	1.73	11.16	2.9	7,052	12,694
				2	.....	40.24	51.01	8.75	4.01	5.24	74.21	1.85	5.94	.....	7,525	13,545
				3	.....	44.10	55.90	.....	4.39	5.74	81.33	2.03	6.51	.....	8,247	14,845
WAGONER COUNTY.																
Broken Arrow, 3½ miles northeast of; sec. 15, T. 18 N., R. 15 E.; Arkansas Valley strip pit.	.....	20832	B	1	8.27	34.04	51.04	6.65	2.52	.....	.....	.....	.....	6.1	6,986	12,575
				2	.....	37.11	55.64	7.25	2.75	.....	.....	.....	.....	.....	7,616	13,709
				3	.....	40.01	59.99	.....	2.97	.....	.....	.....	.....	.....	8,212	14,782
OREGON.																
CLACKAMAS COUNTY.																
Wilhoit, ½ mile southeast of; sec. 15, T. 6 S., R. 2 E.; prospect (10 feet from opening).	.....	22492	B	1	15.05	25.98	40.25	18.72	.45	5.27	50.68	.80	24.08	7.7	4,925	8,865
				2	.....	30.58	47.38	22.04	.53	4.24	59.66	.94	12.59	.....	5,798	10,436
				3	.....	39.22	60.78	.....	.68	5.44	76.53	1.21	16.14	.....	7,437	13,387
COOS COUNTY.																
West Fork, 35 miles west of; T. 33 S., R. 11 W.; Cabin prospect (face of prospect, 20 feet from surface).	.....	17707	B	1	12.57	35.02	37.67	14.74	1.28	.....	.....	.....	.....	9.3	5,748	10,346
				2	.....	40.06	43.08	16.86	1.46	.....	.....	.....	.....	.....	6,575	11,835
				3	.....	48.18	51.82	.....	1.76	.....	.....	.....	.....	.....	7,908	14,234
35 miles west of; T. 33 S., R. 11 W.; Everett Association prospect (left rib of entry, 35 feet from opening).	.....	17708	B	1	15.06	33.24	31.37	20.33	1.29	.....	.....	.....	.....	12.0	5,021	9,038
				2	.....	39.13	36.94	23.93	1.52	.....	.....	.....	.....	.....	5,911	10,640
				3	.....	51.44	48.56	.....	2.00	.....	.....	.....	.....	.....	7,771	13,988
35 miles west of; T. 33 S., R. 11 W.; G. W. Donnell prospect (face of adit, 40 feet in).	.....	17706	B	1	10.77	30.94	31.78	26.51	1.02	.....	.....	.....	.....	6.8	4,821	8,678
				2	.....	34.67	35.62	29.71	1.14	.....	.....	.....	.....	.....	5,403	9,725
				3	.....	49.33	50.67	.....	1.62	.....	.....	.....	.....	.....	7,687	13,837
35 miles west of; SE. ¼ SW. ¼ sec. 20, T. 32 S., R. 11 W.; Pulford prospect, Anderson bed (125 feet from mouth, 4 feet from face, upper bench).	.....	19877	B	1	7.85	30.39	31.46	30.30	1.11	.....	.....	.....	.....	3.8	4,690	8,442
				2	.....	32.98	34.14	32.88	1.20	.....	.....	.....	.....	.....	5,090	9,162
				3	.....	49.14	50.86	.....	1.79	.....	.....	.....	.....	.....	7,584	13,651
Same (lower bench)	.....	19878	B	1	14.58	28.95	29.44	27.03	.56	.....	.....	.....	.....	10.8	4,408	7,934
				2	.....	33.89	34.47	31.64	.66	.....	.....	.....	.....	.....	5,160	9,288
				3	.....	49.57	50.43	.....	.97	.....	.....	.....	.....	.....	7,548	13,586
35 miles west of; NW. ¼ NW. ¼ sec. 28, T. 32 S., R. 11 W.; Reeves prospect, Carter bed (face of drift, 110 feet from entrance).	.....	17704	B	1	8.29	26.75	27.63	37.33	.57	.....	.....	.....	.....	2.9	3,901	7,022
				2	.....	29.17	30.13	40.70	.62	.....	.....	.....	.....	.....	4,254	7,657
				3	.....	49.19	50.81	.....	1.05	.....	.....	.....	.....	.....	7,174	12,913
35 miles west of; T. 33 S., R. 11 W.; W. B. Meyers prospect, Meyers bed (face of prospect adit, 50 feet in).	.....	17705	B	1	9.21	34.25	32.31	24.23	1.68	.....	.....	.....	.....	5.5	5,108	9,194
				2	.....	37.72	35.59	26.69	1.85	.....	.....	.....	.....	.....	5,626	10,127
				3	.....	51.45	48.55	.....	2.52	.....	.....	.....	.....	.....	7,674	13,813
GRANT COUNTY.																
Dayville, 5½ miles east of; NW. ¼ NW. ¼ sec. 11, T. 13 S., R. 27 E. (face of old prospect).	.....	*18125	B	1	34.73	20.00	14.17	31.10	1.41	.....	.....	.....	.....	27.4	.....	.....
				2	.....	30.64	21.71	47.65	2.16	.....	.....	.....	.....	.....	.....	.....
				3	.....	58.53	41.47	.....	4.13	.....	.....	.....	.....	.....	.....	.....
WHEELER COUNTY.																
Fossil, 12 miles south of; SW. ¼ SE. ¼ sec. 28, T. 8 S., R. 21 E.; Dry Hollow prospect (north side of drift, 20 feet from entrance; upper part of section).	.....	18126	B	1	13.78	22.84	29.19	34.19	.47	.....	.....	.....	.....	7.2	.....	.....
				2	.....	26.49	33.86	39.65	.55	.....	.....	.....	.....	.....	.....	.....
				3	.....	43.89	56.11	.....	.91	.....	.....	.....	.....	.....	.....	.....
Same (lower part of section)	.....	18127	B	1	13.41	23.73	32.07	30.79	.46	.....	.....	.....	.....	6.6	4,038	7,268
				2	.....	27.41	37.03	35.56	.53	.....	.....	.....	.....	.....	4,663	8,393
				3	.....	42.54	57.46	.....	.82	.....	.....	.....	.....	.....	7,236	13,025

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine note (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PENNSYLVANIA.																
ALLEGHENY COUNTY.																
Bruceton, 1 mile south of; Experimental mine, Pittsburgh bed (1 cut through between 1 and 2 rooms, 1 east butt entry, 8 feet from east rib of 1 room, 1,000 feet from mine mouth, 1-foot 11-inch cut from center of section).	.....	18843	A	1	2.80	34.44	53.95	8.81	.87	5.16	74.51	1.46	9.19	1.3	7,441	13,394
				2	.....	35.43	55.51	9.06	.90	4.99	76.66	1.50	6.89	.....	7,655	13,779
				3	.....	38.96	61.04	.....	.99	5.49	84.30	1.65	7.57	.....	8,417	15,151
Same (1-foot 5¼-inch cut from bottom of section)	.....	18845	A	1	3.06	35.65	53.72	7.57	1.95	5.16	75.03	1.41	8.88	1.5	7,452	13,414
				2	.....	36.78	55.41	7.81	2.01	4.97	77.40	1.45	6.36	.....	7,687	13,837
				3	.....	39.90	60.10	.....	2.18	5.39	83.96	1.57	6.90	.....	8,338	15,008
Same (1-foot 4½-inch cut from top of section)	.....	18847	A	1	1.98	38.56	54.73	4.73	1.67	5.39	78.63	1.60	7.98	.4	7,869	14,164
				2	.....	39.34	55.83	4.83	1.70	5.27	80.22	1.63	6.35	.....	8,028	14,450
				3	.....	41.34	58.66	.....	1.79	5.54	84.30	1.71	6.66	.....	8,436	15,185
Same (face of 2 room, 1 butt entry)	.....	22618	A	1	2.72	37.00	54.18	6.10	.96	5.44	77.55	1.58	8.87	.6	7,683	13,829
				2	.....	38.04	55.69	6.27	.99	5.28	79.72	1.62	6.12	.....	7,898	14,216
				3	.....	40.58	59.42	.....	1.06	5.63	85.05	1.73	6.53	.....	8,426	15,167
Carnegie; Mansfield mine, Pittsburgh or No. 8 bed (slack coal from car)	.....	18186	C	1	6.11	33.03	49.07	11.79	1.67	.....	.....	.....	.....	4.4	6,782	12,208
				2	.....	35.18	52.26	12.56	1.78	.....	.....	.....	.....	.....	7,224	13,003
				3	.....	40.23	59.77	.....	2.04	.....	.....	.....	.....	.....	8,260	14,868
Same (another car)	.....	18535	C	1	3.69	33.45	50.48	12.38	1.92	.....	.....	.....	.....	2.3	6,935	12,483
				2	.....	34.73	52.42	12.85	1.99	.....	.....	.....	.....	.....	7,201	12,962
				3	.....	39.85	60.15	.....	2.28	.....	.....	.....	.....	.....	8,262	14,872
Same (another car)	.....	18880	C	1	3.47	31.77	45.77	18.99	2.03	.....	.....	.....	.....	2.0	6,407	11,533
				2	.....	32.91	47.42	19.67	2.10	.....	.....	.....	.....	.....	6,637	11,947
				3	.....	40.97	59.03	.....	2.61	.....	.....	.....	.....	.....	8,262	14,872
Same (another car)	.....	19430	C	1	3.85	33.79	50.77	11.59	1.98	.....	.....	.....	.....	2.1	7,015	12,627
				2	.....	35.14	52.81	12.05	2.06	.....	.....	.....	.....	.....	7,296	13,133
				3	.....	39.95	60.05	.....	2.34	.....	.....	.....	.....	.....	8,296	14,933
Same (another car)	.....	17680	C	1	5.23	33.75	49.55	11.47	1.61	.....	.....	.....	.....	3.2	6,878	12,380
				2	.....	35.61	52.29	12.10	1.70	.....	.....	.....	.....	.....	7,258	13,064
				3	.....	40.51	59.49	.....	1.93	.....	.....	.....	.....	.....	8,257	14,863

Elizabeth; Patterson No. 2 mine, Pittsburgh bed (rib of 11 face entry, 93 feet inby 14 butt entry).	20032	A	1	2.45	35.44	56.69	5.42	.79					1.4	7,736	13,925
			2		36.33	58.11	5.56	.81						7,930	14,274
			3		38.47	61.53		.86						8,397	15,115
Same (from pillar of 9 butt entry, near 11 face entry)	20034	A	1	2.53	33.85	57.26	6.36	.78	5.33	78.10	1.60	7.83	1.5	7,645	13,761
			2		34.73	58.74	6.53	.80	5.18	80.13	1.64	5.72		7,844	14,119
			3		37.16	62 84		.86	5.54	85.73	1.75	6.12		8,392	15,106
BEDFORD COUNTY.															
Hopewell, 2 miles southeast of; Cambria No. 2 mine, Upper Freeport bed (face of Young heading).	W46790	A	1	1.2	16.3	72.0	10.5	1.70						7,650	13,770
Same (face of left level, dip heading)	W46791	A	1	1.1	16.7	69.4	12.8	2.35						7,428	13,370
Same (face of main air entry)	W46792	A	1	1.3	16.4	70.7	11.6	1.10						7,556	13,600
Same (face of last room in Fisher heading)	W46793	A	1	1.2	16.3	70.5	12.0	1.65						7,483	13,470
Same (face of 9 room, inby 4 sidetrack on main level)	W46794	A	1	1.1	16.6	71.3	11.0	2.20						7,594	13,670
Same (composite of samples W46790, W46791, W46792, W46793, and W46794).	19611	A	1	1.18	16.42	70.84	11.56	1.88	4.24	77.77	1.40	3.15		7,566	13,619
			2		16.62	71.68	11.70	1.90	4.16	78.70	1.42	2.12		7,656	13,781
			3		18.82	81.18		2.15	4.71	89.13	1.61	2.40		8,670	15,606
3 miles southeast of; Chevington No. 3 mine, Barnett bed (face of 1 room, dip heading, 300 feet from mine mouth).	W46785	A	1	1.3	17.3	76.0	5.4	1.25						8,133	14,640
Same (face of dip heading, 500 feet from mine mouth)	W46786	A	1	2.0	16.5	75.5	6.0	1.60						7,989	14,380
Same (composite of samples W46785 and W46786)	19613	A	1	1.68	16.65	75.82	5.85	1.51	4.46	83.48	1.30	3.40		8,060	14,508
			2		16.93	77.12	5.95	1.54	4.34	84.91	1.32	1.94		8,198	14,756
			3		18.00	82.00		1.64	4.61	90.28	1.40	2.07		8,717	15,691
3½ miles southeast of; Glendale No. 2 mine, Barnett bed (face of last room on level heading, 400 feet from mine mouth).	W46787	A	1	1.3	17.3	75.3	6.1	1.35						8,028	14,450
Same	W46788	A	1	1.2	17.7	74.4	6.7	1.35						8,039	14,470
Same (composite of samples W46787 and W46788)	19612	A	1	1.25	17.81	74.28	6.66	1.43	4.37	82.79	1.34	3.41		8,032	14,458
			2		18.04	75.22	6.74	1.45	4.28	83.84	1.36	2.33		8,134	14,641
			3		19.34	80.66		1.55	4.59	89.90	1.46	2.50		8,722	15,700
Same, Glendale No. 1 mine (face of level drift, 1,000 feet from mine mouth).	W46789	A	1	1.4	18.4	75.5	4.7	1.10						8,189	14,740
			2		18.7	76.5	4.8	1.10						8,306	14,950
			3		19.6	80.4		1.16						8,722	15,700
BUTLER COUNTY.															
Butler; Muntz mine, Upper Freeport bed (¼ mile southeast of mine mouth).	23128	B	1	2.95	36.76	52.77	7.52	2.98	5.39	74.68	1.43	8.00	1.0	7,509	13,516
			2		37.88	54.37	7.75	3.07	5.21	76.95	1.47	5.55		7,737	13,927
			3		41.06	58.94		3.33	5.65	83.41	1.59	6.02		8,387	15,097
1 mile east of; Thompson mine, Upper Kittanning or C′ bed (250 feet northeast of shaft).	23064	B	1	4.38	34.37	54.24	7.01	2.00	5.25	74.47	1.42	9.85	2.6	7,431	13,376
			2		35.94	56.73	7.33	2.09	4.98	77.88	1.49	6.23		7,771	13,988
			3		38.78	61.22		2.26	5.37	84.04	1.61	6.72		8,386	15,095
2 miles north of; Zenith No. 1 mine, Upper Kittanning or C′ bed (face of 2 entry, 1,500 feet northwest of mine mouth).	23132	B	1	3.72	35.80	56.07	4.41	.84					1.7	7,715	13,887
Same (face of 3 entry, 1,000 feet southwest of mine mouth)	23133	B	1	3.97	36.29	55.43	4.31	.88					1.7	7,713	13,883
Same (composite of samples 23132 and 23133)	23134	B	1	3.73	35.84	56.07	4.36	.89	5.48	77.31	1.53	10.43	1.7	7,699	13,858
			2		37.23	58.24	4.53	.92	5.27	80.30	1.59	7.39		7,997	14,395
			3		38.99	61.01		.96	5.52	84.11	1.67	7.74		8,376	15,077
2 miles southeast of; Vogeley mine, Upper Freeport or E bed (2,200 feet north of mine mouth).	23065	B	1	3.78	34.13	52.56	9.53	3.59	5.08	71.67	1.27	8.86	2.1	7,231	13,016
			2		35.47	54.63	9.90	3.73	4.84	74.49	1.32	5.72		7,515	13,527
			3		39.37	60.63		4.14	5.37	82.68	1.47	6.34		8,341	15,014

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PENNSYLVANIA—Continued.																
BUTLER COUNTY—continued.																
Chicora, 1 mile southwest of; Cunningham mine; Upper Freeport or E bed (15 room, 1 right entry, straight entry, 3,600 feet southwest of mine mouth).	.....	23066	B	1	4.91	32.14	54.71	8.24	1.20	5.25	73.36	1.29	10.66	2.9	7,232	13,018
				2	.....	33.80	57.53	8.67	1.26	4.94	77.15	1.36	6.62	.....	7,605	13,689
				3	.....	37.01	62.99	.....	1.38	5.41	84.47	1.49	7.25	.....	8,327	14,989
Claytonia; Stage mine, Middle Kittanning (?) bed (face of 1 working breast, 2 right entry, 1½ miles north of mine mouth).	.....	23126	B	1	3.71	35.44	47.40	13.45	3.75	5.18	68.42	1.31	7.89	2.0	6,896	12,413
				2	.....	36.80	49.23	13.97	3.89	4.95	71.05	1.36	4.78	.....	7,161	12,890
				3	.....	42.78	57.22	.....	4.52	5.75	82.59	1.58	5.56	.....	8,324	14,983
Jamisonville, 1 mile north of; Victoria mine, Upper Freeport or E bed (face of main entry, 3,000 feet east-northeast of mine mouth).	.....	23129	B	1	3.33	35.08	51.82	9.77	3.37	.....	.....	.....	.....	1.3	7,202	12,964
Same (breast of room, 7 right entry, 1,700 feet east of mine mouth)	.....	23130	B	1	3.08	35.24	49.08	12.60	2.40	.....	.....	.....	.....	1.2	6,987	12,577
Same (composite of samples 23129 and 23130)	.....	23131	B	1	3.24	34.98	50.62	11.16	2.91	5.14	70.64	1.45	8.70	1.2	7,084	12,751
				2	.....	36.15	52.32	11.53	3.01	4.94	73.01	1.50	6.01	.....	7,321	13,178
				3	.....	40.86	59.14	.....	3.40	5.58	82.52	1.70	6.80	.....	8,275	14,895
Jefferson Center, 1½ miles southwest of; Reamer mine, Upper Freeport or E bed (1,200 feet northwest of mine mouth).	.....	23127	B	1	4.57	32.96	54.44	8.03	1.26	5.39	73.86	1.40	10.06	2.4	7,334	13,201
				2	.....	34.54	57.05	8.41	1.32	5.11	77.40	1.47	6.29	.....	7,685	13,833
				3	.....	37.71	62.29	.....	1.44	5.58	84.51	1.60	6.87	.....	8,390	15,102
Unionville, ½ mile east of; Eagle mine, Upper Freeport or E bed (working face of main entry, 1,500 feet slightly west of south of mine mouth).	.....	23125	B	1	3.24	36.87	53.60	6.29	2.58	5.40	74.83	1.56	9.34	1.3	7,535	13,563
				2	.....	38.11	55.39	6.50	2.67	5.21	77.34	1.61	6.67	.....	7,787	14,017
				3	.....	40.76	59.24	.....	2.86	5.57	82.72	1.72	7.13	.....	8,328	14,990
CAMBRIA COUNTY.																
Beaverdale, ½ mile from; Beaver Run mine, Upper Freeport or E bed (face of main slope, 2,000 feet north of slope mouth).	.....	20284	A	1	3.38	17.53	71.81	7.28	.76	.....	.....	.....	.....	2.9	7,773	13,991
Same (face of 3 dip entry, main slope, 2,000 feet N. 45° W. of slope mouth).	.....	20285	A	1	3.43	16.97	70.34	9.26	1.98	.....	.....	.....	.....	3.0	7,598	13,676
Same (face of 1 left heading, 3 dip entry, 1,200 feet N. 45° W. of slope mouth).	.....	20286	A	1	3.43	16.43	70.35	9.79	2.27	.....	.....	.....	.....	3.0	7,535	13,563
Same (rib of crosscut 100 feet outby face of 4 right heading, 2,900 feet N. 30° E. of slope mouth).	.....	20287	A	1	3.58	18.06	70.95	7.41	1.67	.....	.....	.....	.....	3.2	7,751	13,952
Same (face of 3 right advance heading, 4,300 feet N. 70° E. of slope mouth).	.....	20288	A	1	2.68	18.05	71.84	7.43	1.12	.....	.....	.....	.....	2.2	7,824	14,083

Same (face of slant heading, drift heading, 4,900 feet N. 80° E. of slope mouth).	.....	20289	A	1	2.99	17.99	70.88	8.14	2.73	.....	.....	.....	.....	2.5	7,727	13,909
Same (composite of samples 20284, 20285, 20286, 20287, 20288, and 20289).	.....	20290	A	1	3.34	17.69	70.71	8.26	1.72	4.57	79.16	1.39	4.90	2.8	7,692	13,846
				2	.....	18.30	73.15	8.55	1.78	4.35	81.90	1.44	1.98	.....	7,958	14,324
				3	.....	20.01	79.99	.....	1.95	4.76	89.56	1.57	2.16	.....	8,702	15,664
¼ mile north of; Logan No. 6½ mine, Lower Freeport or D bed (left rib looking inby, 70 feet from face of 2 right heading, 2 left heading, main entry, 3,000 feet S. 20° W. of drift mouth).	.....	22448	A	1	2.99	18.30	69.66	9.05	2.96	.....	.....	.....	.....	2.6	7,586	13,655
Same (face of 26 room, main heading, 4,200 feet S. 30° W. of drift mouth).	.....	22449	A	1	2.52	17.69	71.19	8.60	3.27	.....	.....	.....	.....	2.1	7,651	13,772
Same (left rib of 11 room ("back heading"), 25 feet from 1 left heading, main entry, 1,200 feet south of drift mouth).	.....	22450	A	1	3.81	17.16	71 06	7.97	2.47	.....	.....	.....	.....	3.0	7,581	13,646
Same (face of 1 right heading, 2 left heading, main entry, 3,600 feet S. 25° W. of drift mouth).	.....	22451	A	1	2.45	18.59	70.59	8.37	2.56	.....	.....	.....	.....	2.0	7,679	13,822
Same (face of main heading, 4,800 feet S. 30° W. of drift mouth).	.....	22452	A	1	2.52	18.51	70.90	8.07	2.32	.....	.....	.....	.....	2.0	7,727	13,909
Same (composite of samples 22448, 22449, 22450, 22451, and 22452).	.....	22453	A	1	2.86	18.30	70.36	8.48	2.71	4.58	78.64	1.39	4.20	2.3	7,667	13,801
				2	.....	18.84	72.43	8.73	2.79	4.39	80.95	1.43	1.71	.....	7,892	14,206
				3	.....	20.64	79.36	.....	3.06	4.81	88.70	1.57	1.86	.....	8,647	15,565
Bens Creek, 1 mile southwest of; Wilmore No. 1 mine, Upper Freeport or E bed (pillar of 10 room, 5 right entry, 1 slope, 1,575 feet N. 30° W. of slope mouth).	.....	20274	A	1	3.86	18.65	70.59	6.90	1.75	.....	.....	.....	.....	3.1	7,776	13,997
Same (pillar of 4 right entry, 300 feet from 2 slope, 1,500 feet S. 30° E. of slope mouth).	.....	20275	A	1	3.00	21.65	68.94	6.41	2.07	.....	.....	.....	.....	2.4	7,836	14,105
Same (face of 1 room, 4 right entry, 1 slope, 2,250 feet N. 10° W. of slope mouth).	.....	20276	A	1	3.04	19.19	70.94	6.83	1.20	.....	.....	.....	.....	2.4	7,842	14,116
Same (pillar of 6 room, 3 left entry, 2 slope, 2,300 feet N. 80° W. of slope mouth).	.....	20281	A	1	3.17	21.43	68.83	6.57	2.38	.....	.....	.....	.....	2.7	7,826	14,087
Same (pillar of 10 room, 4 left entry, 2 slope, 2,850 feet N. 80° W. of slope mouth).	.....	20282	A	1	3.75	21.07	69.03	6.15	2.44	.....	.....	.....	.....	3.2	7,812	14,062
Same (composite of samples 20274, 20275, 20281, and 20282)	.....	20283	A	1	3.49	20.53	69.37	6.61	2.14	4.85	79.95	1.48	4.97	2.9	7,810	14,058
				2	.....	21.27	71.88	6.85	2.22	4.62	82.84	1.53	1.94	.....	8,093	14,567
				3	.....	22.83	77.17	.....	2.38	4.96	88.93	1.64	2.09	.....	8,688	15,638
½ mile northeast of; Wilmore No. 3 mine, Upper Freeport or E bed (120 feet from face of old slope, opposite 8 right heading, 3,040 feet N. 60° W. of slope mouth).	.....	20273	A	1	3.56	19.55	68.59	8.30	3.05	.....	.....	.....	.....	3.0	7,676	13,817
Same (15 feet from face of 1 left entry, main (old) slope, 1,650 feet N. 80° W. of slope mouth).	.....	20277	A	1	4.51	19.38	67.53	8.58	3.24	.....	.....	.....	.....	4.1	7,569	13,624
Same (20 feet from face of new slope, 1,950 feet north of slope mouth).	.....	20278	A	1	4.15	18.59	71.87	5.39	1.14	.....	.....	.....	.....	3.7	7,909	14,236
Same (5 feet from face of 6 room, 1 right entry, new slope, 1,600 feet N. 20° E. of slope mouth).	.....	20279	A	1	4.28	19.96	70.15	5.61	1.30	.....	.....	.....	.....	3.8	7,855	14,139
Same (composite of samples 20273, 20277, 20278, and 20279)	.....	20280	A	1	4.11	19.03	69.87	6.99	2.20	4.79	79.11	1.40	5.51	3.6	7,752	13,954
				2	.....	19.55	72.86	7.29	2.29	4.52	82.50	1.46	1.94	.....	8,085	14,553
				3	.....	21.41	78.59	.....	2.47	4.88	88.98	1.57	2.10	.....	8,720	15,696
Johnstown, 2 miles south of; Smokeless No. 1 mine, Upper Kittanning or C' bed (or "cement" coal) (face of 2 left entry, main dip entry, 2,200 feet from slope mouth).	.....	22430	A	1	2.55	15.83	71.57	10.05	2.53	.....	.....	.....	.....	2.0	7,508	13,514
Same (face of 2 right entry, main dip entry, 2,850 feet from slope mouth).	.....	22431	A	1	1.62	17.27	71.96	9.15	1.73	.....	.....	.....	.....	1.0	7,710	13,878
Same (face of 2 crosscut, 3 room, 2 right entry, 1,680 feet from slope mouth).	.....	22432	A	1	2.29	15.94	72.47	9.30	2.15	.....	.....	.....	.....	1.6	7,632	13,738

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PENNSYLVANIA—Continued.																
CAMBRIA COUNTY—continued.																
Johnstown, 2 miles south of; Smokeless No. 1 mine, Upper Kittanning C′ bed (composite of samples 22430, 22431, and 22432).	.....	22433	A	1	2.15	16.22	72.13	9.50	2.13	4.35	79.21	1.37	3.44	1.5	7,614	13,705
				2	.....	16.58	73.71	9.71	2.18	4.20	80.95	1.40	1.56	.....	7,782	14,008
				3	.....	18.36	81.64	.....	2.41	4.65	89.65	1.55	1.74	.....	8,619	15,514
Llanfair, 1 mile south of; Scalp Level No. 2 mine, Miller or B bed (rib of main car return entry connecting air and hoisting shafts, 160 feet N. 60° E. of air shaft.	.....	20299	A	1	2.54	18.87	74.10	4.49	.76	4.79	84.17	1.27	4.52	2.1	8,167	14,701
Same (south rib, 110 feet from face of 1 east entry, 240 feet S. 30° E. of air shaft).	.....	20413	A	1	1.99	20.92	72.63	4.46	.69	.....	.....	.....	.....	1.6	8,185	14,733
Same (north rib, 15 feet from face of drift driven to connect with old workings, 110 feet N. 30° W. of air shaft).	.....	20414	A	1	3.00	18.75	73.14	5.11	.67	.....	.....	.....	.....	2.6	8,042	14,47
Same (face of loaded track haul, 90 feet N. 10° W. of air shaft)..	.....	20415	A	1	2.81	18.90	73.16	5.13	.67	.....	.....	.....	.....	2.3	8,046	14,483
Same (composite of samples 20299, 20413, 20414, and 20415).....	.....	20416	A	1	2.71	19.38	72.97	4.94	.69	4.70	83.83	1.32	4.52	2.1	8,104	14,587
				2	.....	19.92	75.00	5.08	.71	4.52	86.17	1.36	2.16	.....	8,330	14,994
				3	.....	20.99	79.01	.....	.75	4.76	90.78	1.43	2.28	.....	8,776	15,797
Nanty Glo, 1 mile northeast of; Lincoln No. 1 mine, B, Miller, or Lower Kittanning bed (rib, 25 feet from face of "new" main entry, 5,400 feet N. 70° E. of drift mouth).	.....	22514	A	1	3.39	20.08	69.43	7.10	1.81	.....	.....	.....	.....	2.8	7,822	14,080
Same (face of 7 right heading, "new" main entry, 4,800 feet N. 60° E. of drift mouth).	.....	22515	A	1	3.06	20.24	70.95	5.75	1.52	.....	.....	.....	.....	2.5	8,013	14,423
Same (rib next to face 12 room, 20 feet off 4 left heading, 4 right entry, and 5,250 feet N. 50° E. of drift mouth).	.....	22516	A	1	3.72	19.81	69.59	6.88	2.23	.....	.....	.....	.....	3.1	7,838	14,108
Same (9 back heading stump, 150 feet off "hill" entry, 5,100 feet N. 30° E. of drift mouth).	.....	22517	A	1	2.72	20.99	70.03	6.26	1.93	.....	.....	.....	.....	2.1	7,959	14,326
Same (face of "McFadden G" heading, 3,800 feet N. 10° E. of drift mouth).	.....	22518	A	1	3.72	21.02	69.84	5.42	1.43	.....	.....	.....	.....	3.1	7,953	14,315
Same (face of 7 room, 100 feet off "McFadden F" heading, 3,100 feet N. 20° E. of drift mouth).	.....	22519	A	1	3.13	20.46	70.81	5.60	1.60	.....	.....	.....	.....	2.6	7,999	14,398
Same (composite of samples 22514, 22515, 22516, 22517, 22518, and 22519).	.....	22520	A	1	3.31	20.47	70.03	6.19	1.76	4.94	80.66	1.13	5.32	2.7	7,947	14,305
				2	.....	21.17	72.43	6.40	1.82	4.73	83.42	1.17	2.46	.....	8,219	14,794
				3	.....	22.62	77.38	.....	1.94	5.05	89.13	1.25	2.63	.....	8,781	15,806

Same (car sample)	22521	C	1	2.08	20.93	69.40	7.59	2.49					1.4	7,915	14,247
			2		21.37	70.88	7.75	2.54						8,083	14,549
			3		23.17	76.83		2.75						8,762	15,772
½ mile southeast of; Springfield No. 1 mine, Lower Kittanning or B bed (9 room, 9 left heading, 4,700 feet from slope mouth).	W46483	A	1	2.50	19.40	72.10	6.00	1.75						7,967	14,340
Same (rib in 12 room, 8 left heading, 4,400 feet from slope mouth).	W46484	A	1	3.20	19.60	71.40	5.80	2.00						7,911	14,240
Same (in 6 room, 7 slant heading, 7 left heading, 5,000 feet from slope mouth).	W46486	A	1	2.40	20.00	71.10	6.50	2.15						7,933	14,280
Same (300 feet off 9 left heading parallel with main heading, 4,600 feet from slope mouth).	W46487	A	1	2.40	20.60	71.10	5.90	1.55						7,989	14,380
Same (15 feet from face of 4 left heading, main heading, 5,100 feet from slope mouth).	W46488	A	1	2.50	19.50	71.70	6.30	2.30						7,900	14,220
Same (100 feet on rib from face of 7 left heading, 5,200 feet from slope mouth).	W46489	A	1	2.60	19.40	70.50	7.50	3.15						7,806	14,050
Same (from face of 30 room, 3 left heading, main heading, 4,700 feet from slope mouth).	W46490	A	1	2.30	20.40	70.90	6.40	2.05						7,950	14,310
Same (composite of samples W46483, W46484, W46486, W46487, W46488, W46489, and W46490).	19579	A	1	2.54	19.85	71.22	6.39	2.12	4.70	81.17	1.33	4.29		7,953	14,315
			2		20.37	73.07	6.56	2.18	4.54	83.29	1.36	2.07		8,160	14,688
			3		21.80	78.20		2.33	4.86	89.14	1.46	2.21		8,733	15,719
Portage, 1½ miles southeast of; Trout Run No. 5 mine, Upper Freeport or E bed (face of 9 room, 230 feet from 3 left heading, 1,900 feet northeast of slope mouth).	W46811	A	1	1.70	20.90	69.60	7.80	1.80						7,861	14,150
Same (face of 3 room, 1 right heading, 700 feet northeast of slope mouth).	W46812	A	1	2.60	19.50	69.50	8.40	1.50						7,744	13,940
Same (face of 26 room, 30 feet off 2 left heading, 2,500 feet northeast of slope mouth).	W46813	A	1	2.20	20.00	67.40	10.40	3.20						7,556	13,600
Same (face of 3 left air course, opposite 15 room, 2,500 feet northeast of slope mouth).	W46814	A	1	2.10	20.30	70.30	7.30	1.30						7,894	14,210
Same (face of 2 right heading, opposite 13 room, 1,000 feet east of slope mouth).	W46815	A	1	2.80	18.70	71.40	7.10	2.05						7,850	14,130
Same (composite of samples W46811, W46812, W46813, W46814, and W46815).	19610	A	1	2.28	19.03	70.48	8.21	2.18	4.56	79.33	1.40	4.32		7,758	13,964
			2		19.47	72.13	8.40	2.23	4.41	81.18	1.43	2.35		7,939	14,290
			3		21.26	78.74		2.43	4.81	88.62	1.56	2.58		8,667	15,601
CENTER COUNTY.															
Clarence, 1½ miles northwest of; No. 22 mine, Lower A bed (main entry, ¾ mile from mine mouth).	17447	B	1	1.88	22.00	61.55	14.57	.99	4.43	73.26	1.26	5.49	1.2	7,097	12,775
			2		22.42	62.73	14.85	1.01	4.30	74.67	1.28	3.89		7,233	13,019
			3		26.33	73.67		1.19	5.05	87.69	1.50	4.57		8,494	15,289
1½ miles northeast of; Poormansite mine, B or Lower Kittanning bed (side entry, 1,000 feet from mine mouth).	17444	B	1	3.38	22.83	61.39	12.40	.88	4.69	74.44	1.45	6.14	2.1	7,244	13,039
			2		23.63	63.54	12.83	.91	4.46	77.05	1.50	3.25		7,498	13,496
			3		27.11	72.89		1.04	5.12	88.39	1.72	3.73		8,602	15,484
Same, D or Lower Freeport bed (side entry, 600 feet from mine mouth).	17445	B	1	3.52	22.07	66.61	7.80	1.79					2.2	7,701	13,862
			2		22.88	69.04	8.08	1.86						7,982	14,368
			3		24.89	75.11		2.02						8,684	15,631
Gillingtown, ½ mile northeast of; No. 15 mine, D or Lower Freeport bed (main entry, 500 feet from mine mouth).	17446	B	1	3.45	23.71	61.60	11.24	2.66	4.78	73.51	1.34	6.47	2.1	7,255	13,059
			2		24.56	63.80	11.64	2.75	4.56	76.13	1.39	3.53		7,514	13,525
			3		27.79	72.21		3.11	5.16	86.16	1.57	4.00		8,504	15,307

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PENNSYLVANIA—Continued.																
CLEARFIELD COUNTY.																
Berwindale, ½ mile southeast of; Reed mine, D, Moshannon or Lower Freeport bed (face of room, about 150 feet from 4 left entry, and 1,400 feet S. 45° E. of slope mouth).	.....	22536	A	1	2.22	24.99	62.09	10.70	3.60	.....	.....	.....	.....	1.7	7,592	13,666
Same (face of 4 left heading, 1,800 feet S. 45° E. of slope mouth)	.....	22535	A	1	2.80	25.68	62.66	8.86	2.96	.....	.....	.....	.....	2.1	7,673	13,811
Same (face of 3 right back heading, 1,800 feet S. 30° W. of slope mouth).	.....	22537	A	1	2.86	24.20	64.14	8.80	4.32	.....	.....	.....	.....	2.2	7,671	13,808
Same (face of 4 right heading, 2,200 feet N. 45° W. of slope mouth)	.....	22538	A	1	2.83	23.84	64.01	9.32	3.15	.....	.....	.....	.....	2.2	7,649	13,768
Same (face of 4 right butt, 4 right heading, 1,800 feet N. 30° W. of slope mouth).	.....	22539	A	1	3.01	24.97	64.15	7.87	2.83	.....	.....	.....	.....	2.3	7,752	13,954
Same (composite of samples 22535, 22536, 22537, 22538, and 22539)	.....	22540	A	1	2.85	24.65	63.44	9.06	3.46	4.91	76.99	1.28	4.30	2.1	7,660	13,788
				2	.....	25.37	65.30	9.33	3.56	4.72	79.25	1.32	1.82	.....	7,884	14,191
				3	.....	27.98	72.02	.....	3.93	5.21	87.40	1.46	2.00	.....	8,695	15,651
Blain City, ¼ mile east of; Irvona No. 5 mine, Miller or B bed (3 pillar to right in "Peacock" section).	.....	W17058	A	1	2.20	21.00	69.30	7.50	1.05	.....	.....	.....	.....	.....	7,872	14,170
Same (face of 3 room, Rosser heading)	.....	W17059	A	1	2.80	21.50	68.20	7.50	.75	.....	.....	.....	.....	.....	7,828	14,090
Same (composite of samples W17058 and W17059)	.....	11703	A	1	1.55	.....	.....	7.50	.95	4.69	81.28	1.21	4.37	1.6	.....	.....
				2	.....	.....	.....	7.62	.96	4.59	82.56	1.23	3.04	.....	.....	.....
				3	.....	.....	.....	.....	1.04	4.97	89.37	1.33	3.29	.....	.....	.....
Carnwath; Carnwath No. 1 mine, D, Moshannon or Lower Freeport bed (face of 7 room, 3 right entry, 75 feet from face of entry, 2,100 feet N. 30° W. of drift mouth).	.....	20342	A	1	3.03	24.30	64.96	7.71	1.60	.....	.....	.....	.....	2.4	7,773	13,991
Same (face of 2 left entry, 1 left entry, 2,400 feet east of drift mouth).	.....	20343	A	1	3.28	23.94	66.69	6.09	1.44	.....	.....	.....	.....	2.5	7,857	14,143
Same (composite of samples 20342 and 20343)	.....	20346	A	1	3.13	24.47	65.62	6.78	1.46	4.97	79.66	1.42	5.71	2.5	7,823	14,081
				2	.....	25.26	67.74	7.00	1.51	4.77	82.23	1.47	3.02	.....	8,076	14,537
				3	.....	27.16	72.84	.....	1.62	5.13	88.42	1.58	3.25	.....	8,684	15,631
Same (west rib of 1 room, 2 left back heading, 3,550 feet N. 40° E. of drift mouth).	.....	20494	A	1	3.52	24.50	66.12	5.86	.66	.....	.....	.....	.....	2.8	7,857	14,143
				2	.....	25.39	68.54	6.07	.68	.....	.....	.....	.....	.....	8,144	14,659
				3	.....	27.03	72.97	.....	.72	.....	.....	.....	.....	.....	8,670	15,606

Same (1 crosscut, 2 room, 2 right heading, 2 left entry, 3,750 feet N. 40° W. of opening).	20495	A	1	3.67	23.89	66.11	6.33	.89					3.0	7,811	14,060
			2		24.80	68.63	6.57	.92						8,109	14,596
			3		26.54	73.46		.98						8,679	15,622
Same (west rib of 7 room, 1 right heading, 2 left entry, 3,700 feet N. 45° E. of drift mouth).	20496	A	1	2.80	24.28	66.32	6.60	.93					2.0	7,851	14,132
			2		24.98	68.23	6.79	.96						8,077	14,539
			3		26.80	73.20		1.03						8,665	15,597
2½ miles southwest of; Carnwath No. 2 mine, D or Moshannon bed (about 20 feet from face of 6 right heading, 1,600 feet N. 65° E. of drift mouth).	20338	A	1	2.58	25.63	64.29	7.50	2.55					2.0	7,793	14,027
Same (crosscut 5 room, 5 left heading, 1,200 feet N. 55° E. of drift mouth).	20339	A	1	2.84	24.40	66.01	6.75	1.78					2.2	7,861	14,150
Same (face of 6 room, 4 right heading, 1,200 feet S. 80° E. of drift mouth).	20340	A	1	3.39	25.30	64.11	7.20	2.57					2.7	7,776	13,997
Same (near face of 1 left heading, 700 feet N. 40° W. of drift mouth).	20341	A	1	2.81	24.90	63.58	8.71	1.77					2.2	7,679	13,822
Same (composite of samples 20338, 20339, 20340, and 20341)	20344	A	1	2.91	25.21	64.40	7.48	2.18	4.94	78.74	1.36	5.30	2.3	7,783	14,009
			2		25.97	66.33	7.70	2.25	4.76	81.10	1.40	2.79		8,016	14,429
			3		28.14	71.86		2.44	5.16	87.86	1.52	3.02		8,685	15,633
Coalport, 2½ miles east of; Irvona No. 10 mine, Miller or B bed (2 right entry, main heading).	W17056	A	1	3.00	21.00	68.00	8.00	.65						7,767	13,980
Same (10 face entry, 500 feet off 5 left entry)	W17057	A	1	2.00	21.50	68.00	8.50	.75						7,822	14,080
Same (composite of samples W17056 and W17057)	11702	A	1	1.50			8.05	.76	4.69	80.87	1.24	4.39	1.5		
			2				8.17	.77	4.59	82.10	1.26	3.11			
			3					.84	5.00	89.41	1.37	3.38			
Dubois, 3½ miles south of; Eriton mine, Lower Freeport or D bed (200 feet southwest of shaft).	17443	B	1	1.97	31.10	58.28	8.65	2.01	5.04	76.99	1.60	5.71	1.0	7,630	13,734
			2		31.73	59.45	8.82	2.05	4.92	78.54	1.63	4.04		7,783	14,009
			3		34.80	65.20		2.25	5.40	86.13	1.79	4.43		8,536	15,365
Houtzdale, 2 miles south of; Mountain Branch mine, Brookville or A bed (face of 2 left heading, 1,350 feet southeast of mine mouth).	W46816	A	1	.80	23.30	64.90	11.00	3.45						7,572	13,630
Same (face of main heading, 1,350 feet southeast of mine mouth)	W46817	A	1	5.00	21.60	65.30	8.10	2.75						7,367	13,260
Same (face of 1 dip heading, 1 left heading, 1,000 feet east of mine mouth).	W46818	A	1	1.90	23.60	61.90	12.60	3.25						7,322	13,180
Same (face of 3 left heading, 1,400 feet southeast of mine mouth)	W46819	A	1	2.10	22.50	64.00	11.40	3.85						7,383	13,290
Same (face of last room, 1 left heading, 1,450 feet southeast of mine mouth).	W46820	A	1	1.90	23.10	62.80	12.20	4.10						7,378	13,280
Same (composite of samples W46816, W46817, W46818, W46819, and W46820).	19615	A	1	2.34	22.81	63.81	11.04	3.59	4.42	75.20	1.12	4.63		7,422	13,360
			2		23.36	65.34	11.30	3.68	4.26	77.00	1.15	2.61		7,600	13,680
			3		26.34	73.66		4.15	4.80	86.81	1.30	2.94		8,568	15,422
Karthaus, ½ mile south of; Horseshoe mine, B or Lower Kittanning bed (3 room, 2 entry, 1,000 feet from mine mouth).	17441	B	1	2.45	22.41	66.39	8.75	3.15	4.71	78.05	1.36	3.98	1.4	7,661	13,790
			2		22.97	68.06	8.97	3.23	4.55	80.01	1.39	1.85		7,853	14,135
			3		25.23	74.77		3.55	5.00	87.89	1.53	2.03		8,627	15,529
Near; Shinola mine, Brookville or A bed (main entry, 600 feet from mine mouth).	17442	B	1	2.82	20.21	63.87	13.10	3.04	4.66	72.98	1.27	4.95	1.9	7,216	12,989
			2		20.80	65.72	13.48	3.13	4.48	75.10	1.31	2.50		7,425	13,365
			3		24.04	75.96		3.62	5.18	86.80	1.51	2.89		8,582	15,448
ELK COUNTY.															
Brandy Camp; Elbon No. 5 mine, Lower Kittanning or B bed (1 left entry, 4 drift, 1,000 feet from mine mouth).	17458	B	1	2.69	33.69	54.96	8.66	2.89					1.0	7,482	13,468
			2		34.62	56.48	8.90	2.97						7,689	13,840
			3		38.00	62.00		3.26						8,440	15,192
Byrnedale; Byrnedale No. 31 mine, Lower Kittanning or B bed (1 left entry, main entry, 600 feet from mine mouth).	17456	B	1	2.69	32.41	58.58	6.32	2.52	5.22	78.10	1.45	6.39	1.3	7,787	14,017
			2		33.30	60.21	6.49	2.59	5.06	80.26	1.49	4.11		8,002	14,404
			3		35.61	64.39		2.77	5.41	85.83	1.59	4.40		8,557	15,403

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PENNSYLVANIA—Continued.																
ELK COUNTY—continued.																
Dagus; Dagus mine, Lower Kittanning or B bed (room, off 1 right face entry, 1 mile from mine mouth).	.....	17455	B	1	2.92	34.66	52.76	9.66	3.92	5.19	72.67	1.41	7.15	1.5	7,380	13,284
				2	.....	35.70	54.35	9.95	4.04	5.02	74.86	1.45	4.68	.....	7,602	13,684
				3	.....	39.64	60.36	.....	4.49	5.57	83.13	1.61	5.20	.....	8,442	15,196
Wilmere; Dents Run No. 1 mine, Lower Kittanning or B bed (4 left entry, 600 feet from mine mouth).	.....	17457	B	1	3.10	30.57	56.97	9.36	3.45	.....	.....	.....	.....	1.8	7,438	13,388
				2	.....	31.55	58.79	9.66	3.56	.....	.....	.....	.....	.....	7,676	13,817
				3	.....	34.92	65.08	.....	3.94	.....	.....	.....	.....	.....	8,497	15,295
FAYETTE COUNTY.																
East Millsboro; Hustead mine, Pittsburgh bed (face of 2 room, 2 butt, 2 right flat entry, main entry, 3,600 feet southeast of slope mouth).	.....	23093	A	1	2.46	36.05	53.39	8.10	1.90	.....	.....	.....	.....	1.2	7,614	13,705
Same (face of crosscut, 2 right entry, between 1 and 2 butts, 3,500 feet southeast of slope mouth).	.....	23094	A	1	2.50	36.01	53.49	8.00	1.84	.....	.....	.....	.....	1.2	7,633	13,739
Same (face of 3 left flat entry, 5,800 feet northeast of slope mouth)	.....	23095	A	1	2.65	34.94	54.11	8.30	1.67	.....	.....	.....	.....	1.3	7,566	13,619
Same (face of 4 left flat parallel, 6,000 feet northeast of slope mouth).	.....	23096	A	1	2.4	35.40	53.83	8.36	1.55	.....	.....	.....	.....	1.1	7,598	13,676
Same (composite of samples 23093, 23094, 23095, and 23096)	.....	23097	A	1	2.53	35.70	53.60	8.17	1.76	5.19	76.15	1.49	7.24	1.2	7,583	13,649
				2	.....	36.63	54.99	8.38	1.81	5.04	78.13	1.53	5.11	.....	7,780	14,004
				3	.....	39.98	60.02	.....	1.98	5.50	85.28	1.67	5.57	.....	8,492	15,286
INDIANA COUNTY.																
Ernest; Ernest No. 2 mine, Upper Freeport or E bed (face of 4 room, butt entry, 15 right entry, 4 line entry, 14 right entry).	.....	24191	A	1	2.97	30.76	55.25	11.02	3.14	5.02	73.53	1.24	6.05	2.3	7,374	13,273
				2	.....	31.70	56.94	11.36	3.24	4.83	75.78	1.28	3.51	.....	7,600	13,680
				3	.....	35.76	64.24	.....	3.66	5.45	85.49	1.44	3.96	.....	8,574	15,433
Same (near face of 2 room, 14½ entry, from inby side of rib stump just inby 1 break-through to 1 room).	.....	24192	A	1	2.10	30.97	57.09	9.84	2.58	4.99	75.73	1.30	5.56	1.4	7,556	13,601
				2	.....	31.64	58.31	10.05	2.64	4.86	77.36	1.33	3.76	.....	7,718	13,892
				3	.....	35.17	64.83	.....	2.93	5.40	86.00	1.48	4.18	.....	8,580	15,444
Robindale; Robindale mine, Lower Kittanning, Miller, or B bed (face of air course of dip heading).	.....	25135	A	1	1.39	18.89	70.48	9.24	2.38	.....	.....	.....	.....	.9	7,714	13,993

Same (face of 1 room, 1 north parallel)	.....	25136	A	1	2.53	18.23	71.66	7.58	2.09	.....	.....	.....	.....	2.0	7,817	14,071
Same (face of 1 left main heading)	.....	25137	A	1	2.44	20.10	70.89	6.57	1.96	.....	.....	.....	.....	2.0	7,924	14,263
Same (30 feet from foot of slope at face of proposed drainage way to dip heading).	.....	25138	A	1	2.62	19.72	70.30	7.36	2.16	.....	.....	.....	.....	2.1	7,842	14,116
Same (composite of samples 25135, 25136, 25137, and 25138)	.....	25139	A	1	2.18	19.23	70.85	7.74	2.21	4.80	80.62	1.28	3.35	1.7	7,830	14,094
				2	.....	19.66	72.43	7.91	2.26	4.66	82.42	1.31	1.44	.....	8,005	14,409
				3	.....	21.35	78.65	.....	2.45	5.06	89.50	1.42	1.57	.....	8,693	15,647
Scot Glen, ½ mile southwest of; Brush Valley mine, Lower Kittanning, Miller, or B bed (face of 6 right entry, 4,450 feet S. 75° W. of drift mouth).	.....	22501	A	1	5.22	20.60	66.36	7.82	3.11	.....	.....	.....	.....	4.7	7,617	13,711
Same (pillar in 36 room, 280 feet off 7 right heading, 3,300 feet S. 65° W. of drift mouth).	.....	22502	A	1	2.20	22.65	67.57	7.58	2.83	.....	.....	.....	.....	1.6	7,908	14,234
Same (face of 8 right back entry, 3,400 feet S. 55° W. of drift mouth).	.....	22503	A	1	4.15	20.59	67.40	7.86	2.57	.....	.....	.....	.....	3.6	7,703	13,865
Same (face of 11 right back entry, 10 feet off main entry, 3,675 feet S. 30° W. of drift mouth).	.....	22504	A	1	3.02	20.84	68.33	7.81	2.76	.....	.....	.....	.....	2.4	7,799	14,038
Same (face of 1 butt back entry, 5 left entry, 2,025 feet S. 10° W. of drift mouth).	.....	22505	A	1	3.22	20.48	68.36	7.94	3.16	.....	.....	.....	.....	2.7	7,792	14,026
Same (composite of samples 22501, 22502, 22503, 22504, and 22505)	.....	22506	A	1	3.55	20.94	67.59	7.92	2.90	5.00	78.16	1.26	4.76	3.0	7,744	13,939
				2	.....	21.71	70.08	8.21	3.00	4.78	81.04	1.31	1.66	.....	8,029	14,452
				3	.....	23.65	76.35	.....	3.27	5.21	88.28	1.43	1.81	.....	8,747	15,741
Same (taken as loaded into car, 25-ton shipment)	.....	22507	C	1	3.13	21.48	67.49	7.90	2.91	.....	.....	.....	.....	2.5	7,760	13,968
				2	.....	22.17	69.67	8.16	3.00	.....	.....	.....	.....	.....	8,011	14,420
				3	.....	24.14	75.86	.....	3.27	.....	.....	.....	.....	.....	8,723	15,701
JEFFERSON COUNTY.																
Brockwayville, 1 mile west of; West Clarion mine, Lower Freeport bed (8 drift, 2 right entry, 800 feet from mine mouth).	.....	17448	B	1	1.86	34.63	53.23	10.28	2.91	5.00	72.73	1.51	7.57	1.2	7,306	13,151
				2	.....	35.29	54.23	10.48	2.97	4.88	74.11	1.54	6.02	.....	7,445	13,401
				3	.....	39.42	60.58	.....	3.32	5.45	82.79	1.72	6.72	.....	8,317	14,971
Same; Upper Freeport bed (2 room, 14 drift, main entry)	.....	17449	B	1	3.10	32.27	54.96	9.67	1.69	4.99	73.71	1.60	8.34	1.2	7,343	13,217
				2	.....	33.30	56.72	9.98	1.74	4.80	76.07	1.65	5.76	.....	7,578	13,640
				3	.....	36.99	63.01	.....	1.93	5.33	84.51	1.83	6.40	.....	8,418	15,152
Same; Lower Kittanning or B bed (1 face drift, 3 right entry, 4,000 feet from mine mouth).	.....	17450	B	1	1.93	34.49	53.18	10.40	3.38	5.03	74.08	1.51	5.60	.5	7,385	13,293
				2	.....	35.17	54.23	10.60	3.45	4.91	75.54	1.54	3.96	.....	7,530	13,554
				3	.....	39.34	60.66	.....	3.86	5.49	84.50	1.72	4.43	.....	8,423	15,161
SOMERSET COUNTY.																
Bakersville, ½ mile south of; Wyand mine (300 feet southwest of entrance).	.....	17689	B	1	4.18	19.82	63.88	12.12	.67	4.70	74.31	1.27	6.93	2.9	7,175	12,915
				2	.....	20.68	66.67	12.65	.70	4.42	77.55	1.33	3.35	.....	7,488	13,478
				3	.....	23.67	76.33	.....	.80	5.06	88.78	1.52	3.84	.....	8,572	15,430
Berlin, 1½ miles northeast of; John Wills No. 2 mine, Upper Kittanning or C^1 bed (1 butt entry, dip heading, 700 feet from drift mouth).	.....	W46366	A	1	3.00	20.40	66.30	10.30	1.55	.....	.....	.....	.....	.....	7,522	13,540
Same (30 feet from face of main dip heading, 750 feet from drift mouth).	.....	W46367	A	1	2.90	20.60	66.30	10.20	1.90	.....	.....	.....	.....	.....	7,528	13,550
Same (face of 1 left heading, main heading, 800 feet from drift mouth).	.....	W46368	A	1	3.80	19.90	66.50	9.80	1.10	.....	.....	.....	.....	.....	7,422	13,360
Same (composite of samples W46366, W46367, and W46368)	.....	19512	A	1	3.24	19.90	66.56	10.30	1.67	4.65	76.97	1.73	4.68	.....	7,505	13,509
				2	.....	20.57	68.78	10.65	1.73	4.43	79.55	1.79	1.85	.....	7,756	13,961
				3	.....	23.02	76.98	.....	1.94	4.96	89.03	2.00	2.07	.....	8,681	15,626

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PENNSYLVANIA—Continued.																
SOMERSET COUNTY—continued.																
Berlin, 1½ miles east of; John Wills No. 3 mine, Upper Kittanning or C' bed (1 pillar, 7 right heading, main heading, 2,600 feet from mine mouth).	.....	W46369	A	1	2.70	20.90	66.80	9.60	1.15	.....	.....	.....	.....	.....	7,622	13,720
Same (pillar, 8 left heading, between 6 and 7 rooms, 2,500 feet from mine mouth).	.....	W46370	A	1	4.10	20.00	66.10	9.80	1.20	.....	.....	.....	.....	.....	7,461	13,430
Same (face of 8 room, 6 right heading, 2,600 feet from mine mouth).	.....	W46371	A	1	2.50	21.20	66.50	9.80	1.15	.....	.....	.....	.....	.....	7,622	13,720
Same (gangway stump between 3 and 4 rooms, 4 right heading, 1,500 feet from mine mouth).	.....	W46372	A	1	4.30	20.40	65.60	9.70	1.05	.....	.....	.....	.....	.....	7,428	13,370
Same (pillar between 3 and 4 rooms, right heading, 1,400 feet from mine mouth).	.....	W46373	A	1	3.40	20.80	67.50	8.30	1.30	.....	.....	.....	.....	.....	7,650	13,770
Same (composite of samples W46369, W46370, W46371, W46372, and W46373).	.....	19513	A	1	3.39	20.61	66.53	9.47	1.31	4.59	77.29	1.73	5.61	.....	7,566	13,619
				2	.....	21.33	68.87	9.80	1.36	4.36	80.00	1.79	2.69	.....	7,832	14,098
				3	.....	23.65	76.35	.....	1.51	4.83	88.69	1.98	2.99	.....	8,683	15,629
Boswell, 2 miles northwest of; J. G. Berkey mine, Pittsburgh bed (200 feet from entrance).	.....	17832	B	1	3.55	20.37	67.93	8.15	.83	.....	.....	.....	.....	2.4	7,611	13,700
				2	.....	21.12	70.43	8.45	.86	.....	.....	.....	.....	.....	7,891	14,204
				3	.....	23.07	76.93	.....	.94	.....	.....	.....	.....	.....	8,619	15,514
2 miles northwest of; Reuben Horner mine, Pittsburgh bed (50 feet from mouth of slope).	.....	17831	B	1	11.53	20.07	55.16	13.24	.78	.....	.....	.....	.....	6.0	5,682	10,228
				2	.....	22.69	62.34	14.97	.88	.....	.....	.....	.....	.....	6,422	11,560
				3	.....	26.69	73.31	.....	1.03	.....	.....	.....	.....	.....	7,553	13,595
At; Orenda mine, Upper Kittanning bed (30-ton car of run-of-mine coal).	.....	17551	C	1	3.77	16.26	71.06	8.91	.78	4.41	78.87	1.54	5.49	3.0	7,522	13,540
				2	.....	16.90	73.84	9.26	.81	4.15	81.96	1.60	2.22	.....	7,817	14,071
				3	.....	18.62	81.38	.....	.89	4.57	90.32	1.76	2.46	.....	8,614	15,505
Cairnbrook, 2½ miles southeast of; Hitechew or Fleegle mine, Brookville or A bed (entry west of main heading, 300 feet from mine mouth).	.....	19851	B	1	2.94	20.92	65.85	10.29	1.39	4.47	76.78	1.08	5.99	2.0	7,405	13,329
				2	.....	21.55	67.85	10.60	1.43	4.27	79.11	1.11	3.48	.....	7,629	13,732
				3	.....	24.11	75.89	.....	1.60	4.78	88.49	1.24	3.89	.....	8,534	15,361
At; Loyal Hanna No. 6 mine, Lower Kitanning or B bed (face of "empty" southwest entry).	.....	19848	B	1	4.03	17.79	71.75	6.43	.87	.....	.....	.....	.....	3.3	7,810	14,058
Same (face of "loaded" south entry)	.....	19849	B	1	2.75	17.17	73.47	6.61	.79	.....	.....	.....	.....	2.1	7,886	14,195

Same (composite of samples 19848 and 19849)		19850	B	1	3.39	17.15	73.01	6.45	.83	4.75	81.53	1.43	5.01	2.7	7,835	14,103
				2	.....	17.75	75.57	6.68	.86	4.52	84.39	1.48	2.07	.....	8,110	14,598
				3	.....	19.02	80.98	.....	.92	4.84	90.43	1.59	2.22	.....	8,691	15,644
Edie, 1¾ miles northwest of; Levi Berkey mine, Upper Freeport or E bed (400 feet N. 60° W. of drift mouth).		17691	B	1	3.07	18.97	67.08	10.88	1.52	4.60	76.38	1.29	5.33	2.0	7,453	13,415
				2	.....	19.57	69.21	11.22	1.57	4.40	78.80	1.33	2.68	.....	7,689	13,840
				3	.....	22.04	77.96	.....	1.77	4.96	88.76	1.50	3.01	.....	8,661	15,590
Gillette, 1¾ miles southwest of; Jake Miller mine (500 feet northeast of mine mouth).		17692	B	1	2.92	21.68	64.48	10.92	1.16	4.69	76.60	1.39	5.24	2.1	7,477	13,459
				2	.....	22.33	66.42	11.25	1.19	4.50	78.91	1.43	2.72	.....	7,702	13,864
				3	.....	25.16	74.84	.....	1.34	5.07	88.92	1.61	3.06	.....	8,679	15,622
Holsopple, ¼ mile northeast of; Haws No. 3 mine, Lower Kittanning, Miller, or B bed (face of 3 right entry, 7 south entry, 2,900 feet S. 55° W. of shaft).		22541	A	1	2.57	16.19	73.48	7.76	2.45	.....	.....	.....	.....	2.0	7,857	14,143
Same (face of 4 right entry, 7 south entry, 3,000 feet S. 45° W. of shaft).		22542	A	1	2.66	16.39	73.76	7.19	1.97	.....	.....	.....	.....	2.1	7,897	14,215
Same (face of 6 south entry, 2,900 feet S. 30° W. of shaft)		22543	A	1	2.47	15.84	73.35	8.34	2.39	.....	.....	.....	.....	1.9	7,788	14,018
Same (15 room, 1 right entry, 7 south entry, 50 feet up on left rib, 2,900 feet S. 70° W. of drift mouth).		22544	A	1	2.53	16.43	73.39	7.65	2.22	.....	.....	.....	.....	1.9	7,859	14,146
Same (face of main left air course, 3,400 feet S. 80° W. of shaft)		22545	A	1	2.49	17.42	72.04	8.05	2.83	.....	.....	.....	.....	1.9	7,823	14,081
Same (composite of samples 22541, 22542, 22543, 22544, and 22545)		22546	A	1	2.49	16.56	73.22	7.73	2.37	4.46	80.48	1.23	3.73	2.0	7,841	14,114
				2	.....	16.98	75.09	7.93	2.43	4.29	82.53	1.26	1.56	.....	8,041	14,474
				3	.....	18.44	81.56	.....	2.64	4.66	89.64	1.37	1.69	.....	8,733	15,719
Same (car sample)		22547	C	1	1.86	16.44	72.80	8.90	2.66	.....	.....	.....	.....	1.1	7,803	14,045
				2	.....	16.75	74.18	9.07	2.71	.....	.....	.....	.....	.....	7,951	14,312
				3	.....	18.42	81.58	.....	2.98	.....	.....	.....	.....	.....	8,744	15,739
Somerset, ¾ mile northeast of; Neva mine, Upper Freeport or E bed (400 feet from mine mouth).		17693	B	1	2.05	21.11	65.02	11.82	2.44	4.57	76.40	1.30	3.47	1.4	7,463	13,433
				2	.....	21.55	66.38	12.07	2.49	4.43	78.00	1.33	1.68	.....	7,619	13,714
				3	.....	24.51	75.49	.....	2.83	5.04	88.71	1.51	1.91	.....	8,665	15,597
½ mile southeast of; Sanner and Shaffer mine (300 feet from opening)		17694	B	1	3.57	17.60	69.55	9.28	1.63	4.61	77.72	1.20	5.56	2.7	7,516	13,529
				2	.....	18.25	72.13	9.62	1.69	4.37	80.60	1.24	2.48	.....	7,794	14,029
				3	.....	20.19	79.81	.....	1.87	4.83	89.18	1.37	2.75	.....	8,623	15,521
4½ miles southeast of; Stauffer No. 3 mine, Lower Freeport or D bed (1 right entry, 20 feet inside 2 butt entry).		17695	B	1	2.89	18.73	73.19	5.19	.63	4.82	82.90	1.42	5.04	1.7	7,974	14,353
				2	.....	19.29	75.37	5.34	.65	4.63	85.37	1.46	2.55	.....	8,212	14,782
				3	.....	20.38	79.62	.....	.69	4.89	90.18	1.54	2.70	.....	8,675	15,615
Windber, 9 miles south of; Lochrie Arrow mine, Lower Kittanning, B, or Miller bed (face of 7 room, 1 left entry, 250 feet N. 40° E. of mine mouth).		20292	A	1	2.95	18.37	72.30	6.38	1.38	.....	.....	.....	.....	2.6	7,890	14,202
Same (face of 3 left entry, 900 feet N. 60° E. of mine mouth)		20293	A	1	3.19	18.20	71.45	7.16	1.60	.....	.....	.....	.....	2.7	7,829	14,092
Same (face of 2 left entry, 700 feet N. 45° E. of mine mouth)		20294	A	1	3.83	18.38	71.69	6.10	.98	.....	.....	.....	.....	3.3	7,847	14,125
Same (face of crosscut, main air course, 1,100 feet east of mine mouth).		20295	A	1	3.36	17.38	72.03	7.23	1.54	.....	.....	.....	.....	2.9	7,808	14,054
Same (composite of samples 20292, 20293, 20294, and 20295)		20296	A	1	3.38	18.07	71.75	6.80	1.36	4.65	80.87	1.42	4.90	2.9	7,841	14,114
				2	.....	18.70	74.26	7.04	1.41	4.42	83.70	1.47	1.96	.....	8,115	14,607
				3	.....	20.12	79.88	.....	1.52	4.75	90.04	1.58	2.11	.....	8,729	15,712
Same (pillar of 3 room, 2 right entry, 200 feet southeast of mine mouth).		20298	A	1	4.43	17.21	72.45	5.91	1.45	.....	.....	.....	.....	4.0	7,817	14,071
				2	.....	18.01	75.81	6.18	1.52	.....	.....	.....	.....	.....	8,180	14,724
				3	.....	19.20	80.80	.....	1.62	.....	.....	.....	.....	.....	8,719	15,694
Same (car sample)		22534	C	1	1.98	17.60	70.37	10.05	2.12	.....	.....	.....	.....	1.3	7,640	13,752
				2	.....	17.96	71.79	10.25	2.16	.....	.....	.....	.....	.....	7,794	14,029
				3	.....	20.01	79.99	.....	2.41	.....	.....	.....	.....	.....	8,684	15,631
Zimmerman; Ralphton No. 6 mine, Upper Freeport or E bed (1,200 feet east of shaft).		17690	B	1	3.21	17.08	64.60	15.11	1.47	4.38	72.65	1.31	5.08	2.4	7,163	12,893
				2	.....	17.65	66.74	15.61	1.52	4.15	75.06	1.35	2.31	.....	7,401	13,322
				3	.....	20.92	79.08	.....	1.80	4.92	88.95	1.60	2.73	.....	8,770	15,786

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.[b]	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PENNSYLVANIA—Continued.																
TIOGA COUNTY.																
Antrim, ½ mile west of; Anna S. mine, Bloss bed (room, side entry, 1 mile from mine mouth).	.....	17453	B	1	1.87	20.59	65.00	12.54	2.87	.....	.....	.....	.....	1.1	7,305	13,149
				2	.....	20.98	66.24	12.78	2.92	.....	.....	.....	.....	.....	7,445	13,401
				3	.....	24.05	75.95	.....	3.35	.....	.....	.....	.....	.....	8,536	15,365
Landrus, ½ mile north of; Bear Run mine, Bloss bed (pillar, main entry, 700 feet from mine mouth).	.....	17452	B	1	2.35	19.74	65.23	12.68	2.47	.....	.....	.....	.....	1.5	7,287	13,117
				2	.....	20.22	66.79	12.99	2.53	.....	.....	.....	.....	.....	7,463	13,433
				3	.....	23.24	76.76	.....	2.91	.....	.....	.....	.....	.....	8,577	15,439
Morris Run; New mine, Morgan bed (4 room, 1 east entry, 1 mile from mouth of mine).	.....	17451	B	1	1.66	21.51	67.60	9.23	1.73	4.54	78.50	1.38	4.62	.8	7,672	13,810
				2	.....	21.87	68.74	9.39	1.76	4.43	79.83	1.40	3.19	.....	7,802	14,044
				3	.....	24.14	75.86	.....	1.94	4.89	88.10	1.55	3.52	.....	8,610	15,498
Morris Run; New mine, Bloss bed (Sterling entry, 3 miles from mine mouth).	.....	17454	B	1	2.29	20.89	66.94	9.88	1.28	4.52	78.15	1.43	4.74	1.5	7,567	13,621
				2	.....	21.38	68.51	10.11	1.31	4.37	79.98	1.46	2.77	.....	7,744	13,939
				3	.....	23.79	76.21	.....	1.46	4.86	88.98	1.62	3.08	.....	8,615	15,507
WESTMORELAND COUNTY.																
Ligonier, 3 miles southeast of; John Dyer mine, Upper Freeport or E bed (end of workings, 200 feet from mine mouth).	.....	17901	B	1	2.61	21.42	64.38	11.59	1.94	4.63	75.81	1.25	4.78	1.9	7,425	13,365
				2	.....	21.99	66.11	11.90	1.99	4.46	77.84	1.28	2.53	.....	7,624	13,723
				3	.....	24.96	75.04	.....	2.26	5.06	88.36	1.45	2.87	.....	8,654	15,577
TENNESSEE.																
ANDERSON COUNTY.																
Coal Creek, 3 miles north-northwest of; Black Diamond, No. 1 mine, Coal Creek bed (25 pillar, 1 right entry, 12 east entry, 10,900 feet S. 22° W. of mine mouth).	.....	21645	B	1	1.94	36.49	55.99	5.58	1.49	.....	.....	.....	.....	.6	7,851	14,132
Same (face of 11 room, 7 right entry, 12 east entry, 9,500 feet south of mine mouth).	.....	21646	B	1	1.87	36.56	54.95	6.62	1.80	.....	.....	.....	.....	.6	7,751	13,952
Same (face of 4 left entry, 10 west entry, 8,200 feet S. 40° W. of mine mouth).	.....	21647	B	1	1.84	37.25	56.91	4.00	.83	.....	.....	.....	.....	.5	7,974	14,353
Same (face of 1 airway, 1 left entry, 10 west entry, 8,900 feet S. 24° W. of mine mouth).	.....	21648	B	1	1.86	36.67	57.51	3.96	1.00	.....	.....	.....	.....	.6	7,991	14,384

Same (composite of samples 21645, 21646, 21647, and 21648)		21649	B	1	1.83	36.59	56.50	5.08	1.32	5.42	78.95	1.91	7.32	.6	7,889	14,200
				2		37.27	57.56	5.17	1.34	5.32	80.42	1.95	5.80		8,036	14,465
				3		39.30	60.70		1.41	5.61	84.80	2.06	6.12		8,474	15,253
1¼ miles southwest of; Fraterville mine, Coal Creek bed (face of 2 room, 14 right entry, new main entry, 5,560 feet N. 40° W. of mine mouth).		21636	B	1	1.75	36.96	56.61	4.68	1.18					.3	7,863	14,153
				2		37.62	57.62	4.76	1.20						8,003	14,405
				3		39.50	60.50		1.26						8,403	15,125
Same (face of 3 room, 14 right entry, new main entry, 5,700 feet N. 38° W. of mine mouth).		21637	B	1	1.97	36.10	56.29	5.64	.99					.5	7,771	13,988
Same (face of 3 room, 16 left entry, old main entry, 4,900 feet N. 71° W. of mine mouth).		21638	B	1	1.67	36.28	54.98	7.07	.89					.6	7,702	13,864
Same (composite of samples 21637 and 21638)		21639	B	1	1.76	36.51	55.39	6.34	.99	5.47	78.06	1.92	7.22	.6	7,732	13,918
				2		37.16	56.39	6.45	1.01	5.38	79.46	1.95	5.75		7,870	14,166
				3		39.72	60.28		1.08	5.75	84.93	2.08	6.16		8,412	15,142
3 miles north-northwest of; Klondike or No. 5 mine, Coal Creek bed (face of main entry, 7,700 feet N. 65° W. of mine mouth).		21640	B	1	2.22	35.98	56.35	5.45	.83					.7	7,807	14,053
Same (face of 30 left entry, 7,500 feet S. 39° W. of mine mouth)		21641	B	1	1.70	36.44	55.36	6.50	.91					.5	7,765	13,977
Same (face of 22 left entry, 7,900 feet S. 39° W. of mine mouth)		21642	B	1	1.73	36.96	55.91	5.40	.82					.4	7,874	14,173
Same (face of 32 room, 26 left entry, 7,600 feet S. 39° W. of mine mouth).		21643	B	1	2.01	37.00	55.53	5.46	.73					.7	7,848	14,126
Same (composite of samples 21640, 21641, 21642, and 21643)		21644	B	1	1.93	36.57	55.80	5.70	.87	5.49	78.75	1.88	7.31	.6	7,828	14,090
				2		37.29	56.90	5.81	.89	5.38	80.30	1.92	5.70		7,982	14,368
				3		39.59	60.41		.94	5.71	85.25	2.04	6.06		8,474	15,253
4½ miles southwest of; Middle Ridge mine, Coal Creek bed (rib on left main entry, 100 feet southwest of opening).		21680	B	1	2.31	37.38	56.08	4.23	.89					.7	7,878	14,180
				2		38.26	57.41	4.33	.91						8,064	14,515
				3		39.99	60.01		.93						8,429	15,172
1½ miles west of; Smith mine (face of 1 right entry, main entry, 75 feet north of opening).		21627	B	1	3.93	38.41	54.79	2.87	.84					2.2	7,856	14,141
				2		39.98	57.03	2.99	.87						8,177	14,719
				3		41.21	58.79		.90						8,429	15,172
5 miles southwest of; Tennessee mine, Coal Creek bed (A pillar, main entry, 2,840 feet S. 40° W. of mine mouth).		21632	B	1	2.67	36.37	55.54	5.42	1.52					1.1	7,731	13,916
Same (1 room, 625 entry, Minersville side, 4,040 feet S. 57° W. of mine mouth).		21633	B	1	2.54	35.41	52.51	9.54	1.73					1.2	7,387	13,297
Same (1 room, 11 right entry, 4,060 feet S. 88° W. of mine mouth)		21634	B	1	1.95	35.92	51.80	10.33	1.65					.6	7,347	13,225
Same (composite of samples 21632, 21633, and 21634)		21635	B	1	2.34	36.04	53.23	8.39	1.61	5.27	75.23	1.80	7.70	1.0	7,510	13,518
				2		36.90	54.51	8.59	1.65	5.13	77.04	1.84	5.75		7,690	13,842
				3		40.37	59.63		1.81	5.61	84.29	2.01	6.28		8,413	15,141
3 miles southwest of; Thistle mine, Coal Creek bed (face of 2 right entry, main face entry, 1,200 feet S. 30° W. of mouth of Dogwood opening).		21628	B	1	2.52	36.28	56.80	4.40	1.05					1.1	7,866	14,159
Same (face of 63 room, 5 left entry, 1,980 feet S. 72° W. of mine mouth).		21629	B	1	1.96	37.92	53.06	7.06	1.76					.8	7,676	13,817
Same (face of 8 room, 4 left entry, 5 left entry, 2,380 feet S. 52° W. of mine mouth).		21630	B	1	2.16	37.41	53.68	6.75	1.89					1.0	7,713	13,883
Same (composite of samples 21628, 21629, and 21630)		21631	B	1	2.19	37.24	54.45	6.12	1.59	5.40	77.61	1.83	7.45	1.0	7,756	13,961
				2		38.07	55.67	6.26	1.63	5.28	79.35	1.87	5.61		7,930	14,274
				3		40.61	59.39		1.74	5.63	84.65	1.99	5.99		8,460	15,228
Oliver Springs, 1¼ miles north-northeast of; Hall mine, Coal Creek bed (face of main entry, 400 feet east of mine mouth).		21427	B	1	2.12	40.46	53.40	4.02	1.60					.8	7,899	14,218
				2		41.34	54.55	4.11	1.63						8,070	14,526
				3		43.11	56.89		1.70						8,416	15,149
3 miles north-northeast of; Piedmont mine, Coal Creek bed (face of Moore's place, Pigankle entry, 1,200 feet north of mine mouth).		21451	B	1	2.43	37.21	56.64	3.72	2.03					1.1	7,972	14,350

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
TENNESSEE—Continued.																
ANDERSON COUNTY—continued.																
Oliver Springs, 3 miles north-northeast of: Piedmont mine, (face of 18 room, 6 right entry, 4,000 feet north-northwest, 1,325 feet east-northeast, and 200 feet south-southeast of mine mouth).	.....	21452	B	1	1.72	38.91	55.98	3.39	1.22	.....	.....	.....	.....	0.4	8,066	14,519
Same (face 1 of left room, 3 right entry, 2,200 feet north-northwest, and 800 feet east-northeast, and 45 feet north-northwest of mine mouth).	.....	21453	B	1	1.88	39.09	54.33	4.70	1.75	.....	.....	.....	.....	.6	7,955	14,319
Same (mouth of 5 right entry, 3,000 feet north-northwest of mine mouth).	.....	21454	B	1	1.29	41.69	51.08	5.94	1.60	.....	.....	.....	.....	.4	8,012	14,422
				2	.....	42.24	51.74	6.02	1.62	.....	.....	.....	.....	.....	8,117	14,611
				3	.....	44.95	55.05	.....	1.72	.....	.....	.....	.....	.....	8,637	15,547
Same (composite of samples 21451, 21452, and 21453)	.....	21455	B	1	2.02	38.36	55.66	3.96	1.81	5.58	79.45	2.13	7.07	.7	7,988	14,378
				2	.....	39.15	56.81	4.04	1.85	5.47	81.09	2.17	5.38	.....	8,153	14,675
				3	.....	40.80	59.20	.....	1.93	5.70	84.50	2.26	5.61	.....	8,496	15,293
BLEDSOE COUNTY.																
Atpontley, 1 mile north of; Atpontley No. 6 mine, Sewanee bed (face of Lusk entry, 1,000 feet southwest of mine mouth).	.....	22259	B	1	2.87	30.29	59.82	7.02	.82	.....	.....	.....	.....	1.5	7,637	13,747
Same (face of Smith room, Lusk entry, 1,200 feet west-southwest of mine mouth).	.....	22260	B	1	3.06	28.68	58.85	9.41	1.25	.....	.....	.....	.....	1.7	7,431	13,376
Same (composite of samples 22259 and 22260)	.....	22261	B	1	3.02	29.81	58.93	8.24	1.02	5.09	76.67	1.43	7.55	1.6	7,532	13,558
				2	.....	30.74	60.76	8.50	1.05	4.90	79.05	1.47	5.03	.....	7,766	13,979
				3	.....	33.60	66.40	.....	1.15	5.36	86.39	1.61	5.49	.....	8,487	15,277
CAMPBELL COUNTY.																
Anthras, ½ mile south of; Anthras mine, Jellico bed (face of 2 left entry, 2 main entry, 2,450 feet S. 45° E., and 200 feet N. 45° E. of mine mouth).	.....	21853	B	1	3.52	36.78	56.56	3.14	.79	.....	.....	.....	.....	1.7	7,825	14,085
Same (face of 1 left entry, 2 main entry, 2,200 feet S. 45° E., and 300 feet N. 45° E. of mine mouth).	.....	21854	B	1	2.86	36.82	57.12	3.20	.82	.....	.....	.....	.....	1.0	7,868	14,162
Same (10 pillar, 2 right entry, 1 main entry, 400 feet S. 45° E., and 400 feet S. 45° W. of mine mouth).	.....	21855	B	1	3.26	36.72	57.21	2.81	.86	.....	.....	.....	.....	1.3	7,841	14,114

Same (composite of samples 21853, 21854, and 21855)		21856	B	1	3.23	36.82	56.84	3.11	.87	5.60	78.83	1.99	9.60	1.3	7,846	14,123
				2	.....	38.05	58.74	3.21	.90	5.42	81.46	2.06	6.95	.....	8,108	14,594
				3	.....	39.31	60.69	.....	.93	5.60	84.16	2.13	7.18	.....	8,377	15,079
Block, 1 mile west-southwest of; Monarch mine, Monarch bed (face of 49 room, 2 left entry, 1,700 feet south of mine mouth).		22028	B	1	3.40	39.03	49.22	8.35	2.35	.....	.....	.....	.....	1.4	7,297	13,135
Same (face of 3 right entry, 1,050 feet northwest of mine mouth)		22029	B	1	4.08	36.95	48.17	10.80	2.39	.....	.....	.....	.....	2.0	7,025	12,645
Same (face of 23 room, near the face of 2 right entry, 1,050 feet north-northwest of mine mouth).		22030	B	1	4.12	36.15	47.60	12.13	3.66	.....	.....	.....	.....	2.0	6,852	12,334
Same (neck of 1 left entry, 1 left cross entry, 2,000 feet south-southeast of mine mouth).		22031	B	1	4.37	35.72	47.85	12.06	2.22	.....	.....	.....	.....	2.4	6,850	12,330
Same (composite of samples 22028, 22029, 22030, and 22031)		22032	B	1	3.99	37.06	48.11	10.84	2.65	5.27	70.32	1.42	9.50	2.0	7,022	12,640
				2	.....	38.60	50.11	11.29	2.76	5.03	73.25	1.48	6.19	.....	7,314	13,165
				3	.....	43.51	56.49	.....	3.11	5.67	82.57	1.67	6.98	.....	8,246	14,843
5,000 feet west-southwest of; Pee Wee mine, Red Ash bed (on rib near face of 2 left entry, 350 feet west-southwest of mine mouth).		22025	B	1	3.62	37.87	53.42	5.09	.91	.....	.....	.....	.....	1.3	7,539	13,570
Same (face of 1 right entry, 300 feet north of mine mouth)		22026	B	1	3.83	38.36	51.90	5.91	1.14	.....	.....	.....	.....	1.5	7,469	13,444
Same (composite of samples 22025 and 22026)		22027	B	1	3.69	38.01	52.72	5.58	1.00	5.52	75.52	1.75	10.63	1.4	7,507	13,513
				2	.....	39.47	54.74	5.79	1.04	5.31	78.41	1.82	7.63	.....	7,795	14,031
				3	.....	41.90	58.10	.....	1.10	5.64	83.23	1.93	8.10	.....	8,274	14,893
Caryville, 1½ miles southwest of; Bear Wallow mine, Coal Creek bed (face of main entry, 3,000 feet S. 85° W. of mine mouth).		21673	B	1	2.15	37.18	56.47	4.20	.82	.....	.....	.....	.....	.6	7,900	14,220
Same (face of 9 left entry, 2,200 feet S. 85° W. and 1,000 feet S. 5° E. of mine mouth).		21674	B	1	2.27	36.66	56.83	4.24	1.06	.....	.....	.....	.....	.7	7,872	14,170
Same (face of 6 room, 7 right entry, 2,050 feet S. 85° W., and 900 feet N. 5° W. of mine mouth).		21675	B	1	2.33	36.70	56.53	4.44	.87	.....	.....	.....	.....	.7	7,868	14,162
Same (composite of samples 21673, 21674, and 21675)		21676	B	1	2.28	36.68	56.88	4.16	.92	5.51	79.20	1.87	8.34	.7	7,884	14,191
				2	.....	37.53	58.21	4.26	.94	5.38	81.05	1.91	6.46	.....	8,068	14,522
				3	.....	39.20	60.80	.....	.98	5.62	84.66	1.99	6.75	.....	8,427	15,169
1½ miles northwest of; Caryville mine, Red Ash bed (face of 6 room, 4 right entry, 1,150 feet west of mine mouth).		21659	B	1	3.62	38.39	53.66	4.33	1.01	.....	.....	.....	.....	1.2	7,608	13,694
Same (face of 3 room, 10 left entry, 1,850 feet S. 75° W. of mine mouth).		21660	B	1	3.44	37.70	51.70	7.16	1.34	.....	.....	.....	.....	1.3	7,356	13,241
Same (face of 5 room, 15 left entry, 3,275 feet S. 75° W. of mine mouth).		21661	B	1	3.48	38.82	52.73	4.97	1.30	.....	.....	.....	.....	1.1	7,601	13,682
Same (face of 3 room, 15 right entry, 3,875 feet west of mine mouth).		21662	B	1	3.34	38.76	50.86	7.04	1.14	.....	.....	.....	.....	1.2	7,383	13,289
Same (composite of samples 21659, 21660, 21661, and 21662)		21663	B	1	3.38	38.41	52.39	5.82	1.22	5.53	75.36	1.77	10.30	1.2	7,497	13,495
				2	.....	39.75	54.23	6.02	1.26	5.33	78.00	1.83	7.56	.....	7,759	13,966
				3	.....	42.30	57.70	.....	1.34	5.67	83.00	1.95	8.04	.....	8,256	14,861
½ miles southwest of; Pee Wee mine, Lower Dean bed (1 room, main haulageway, 150 feet southwest, 100 feet south, 700 feet east, and 450 feet northeast of mine mouth).		21677	B	1	4.00	37.27	55.36	3.37	.64	.....	.....	.....	.....	1.4	7,699	13,858
Same (face of 4 right entry, 150 feet southwest, 100 feet south, 700 feet southwest of mine mouth).		1678	B	1	3.52	38.40	54.35	3.73	.75	.....	.....	.....	.....	1.0	7,698	13,856
Same (composite of samples 21677 and 21678)		21679	B	1	3.70	37.49	55.35	3.46	.70	5.54	77.92	1.61	10.77	1.2	7,709	13,876
				2	.....	38.93	57.48	3.59	.73	5.33	80.91	1.67	7.77	.....	8,005	14,409
				3	.....	40.38	59.62	.....	.76	5.53	83.92	1.73	8.06	.....	8,303	14,945
1¾ miles north-northwest of; Red Ash mine, Red Ash bed (face of 1 room, 15 right entry, 1 haulageway, 2,550 feet west of mine mouth).		21668	B	1	3.53	39.33	52.15	4.99	1.18	.....	.....	.....	.....	1.3	7,565	13,617
Same (face of 9 left entry, 1 haulageway, 3,025 feet west of mine mouth).		21669	B	1	3.36	37.83	50.59	8.22	1.00	.....	.....	.....	.....	1.2	7,291	13,124
Same (face of 1 room, 7½ left entry, 2,050 feet west of mine mouth)		21670	B	1	3.69 38	.08	53.35	4.88	.87	.....	.....	.....	.....	1.4	7,571	13,628

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
TENNESSEE—Continued.																
CAMPBELL COUNTY—continued.																
Caryville, 1¾ miles north-northwest of; Red Ash mine, Red Ash bed (face of 7 room, 4 right entry, 1,250 feet west and 1,400 feet north of mine mouth).	.....	21671	B	1	3.20	39.24	51.90	5.66	1.10	.....	.....	.....	.....	0.9	7,526	13,547
Same (composite of samples 21668, 21669, 21670, and 21671)	.....	21672	B	1	3.46	38.47	52.23	5.84	1.00	5.57	75.02	1.74	10.83	1.2	7,488	13,478
				2	.....	39.85	54.10	6.05	1.04	5.38	77.71	1.80	8.02	.....	7,756	13,961
				3	.....	42.42	57.58	.....	1.11	5.73	82.71	1.92	8.53	.....	8,255	14,859
1½ miles southwest of; Sun mine, Red Ash bed (face of 30 room, 10 right entry, 2,500 feet north-northwest, 1,400 feet north-northeast, 550 feet east-southeast, and 50 feet south of mine mouth).	.....	21654	B	1	3.33	38.08	50.77	7.82	1.00	.....	.....	.....	.....	1.1	7,345	13,221
Same (face of 17 right entry, 4,000 feet west and 900 feet north of mine mouth).	.....	21655	B	1	3.81	38.30	52.81	5.08	1.37	.....	.....	.....	.....	1.5	7,534	13,561
Same (face of 14 left entry, 2,900 feet west, 1,300 feet south, and 100 feet west of mine mouth).	.....	21656	B	1	3.46	39.29	51.41	5.84	1.05	.....	.....	.....	.....	1.1	7,475	13,455
Same (face of 5 room, 17 left entry, 3,700 feet west and 200 feet south of mine mouth).	.....	21657	B	1	3.38	38.57	52.71	5.34	1.12	.....	.....	.....	.....	1.1	7,486	13,475
Same (composite of samples 21654, 21655, 21656, and 21657)	.....	21658	B	1	3.45	38.61	51.91	6.03	1.13	5.55	75.95	1.70	9.64	1.2	7,450	13,410
				2	.....	39.99	53.76	6.25	1.17	5.35	78.66	1.76	6.81	....	7,716	13,889
				3	.....	42.66	57.34	.....	1.25	5.70	83.91	1.88	7.26	.....	8,231	14,816
Chaska, 3,600 feet southeast of; Chaska mine, Rich Mountain bed (at pillar main entry, 400 feet east of mine mouth).	.....	21811	B	1	4.29	38.97	53.82	2.92	1.41	.....	.....	.....	.....	1.8	7,687	13,837
Same (1 room, 1 right entry, 300 feet southeast of mine mouth)	.....	21812	B	1	4.56	37.88	56.33	1.23	.75	.....	.....	.....	.....	1.8	7,794	14,029
Same (in main entry on panhandle side, 600 feet southwest of mine mouth).	.....	21813	B	1	4.43	38.43	55.68	1.46	.86	.....	.....	.....	.....	1.7	7,801	14,042
Same (composite of samples 21811, 21812, and 21813)	.....	21814	B	1	4.43	38.37	55.34	1.86	1.04	5.94	78.89	1.99	10.28	1.7	7,745	13,941
				2	.....	40.15	57.90	1.95	1.09	5.70	82.55	2.08	6.63	.....	8,104	14,587
				3	.....	40.95	59.05	.....	1.11	5.81	84.19	2.12	6.77	.....	8,265	14,877
Coal Creek, 4 miles north-northwest of; Cambria mine, Coal Creek bed (face of 1 room, 16 left entry, 5,280 feet N. 18° W., and 100 feet S. 72° W. of opening).	.....	21650	B	1	2.11	36.37	58.09	3.43	.86	.....	.....	.....	.....	.6	7,986	14,375

Same (face of 5 room, 17½ right entry, 5,280 feet N. 18° W. and 500 feet N. 72° E. of opening).	21651	B	1	2.23	36.70	56.44	4.63	.77					.7	7,873	14,171
Same (8 and 9 pillars, 21 left entry, 6,280 feet N. 18° W., and 500 feet S. 72° W. of opening).	21652	B	1	1.98	37.63	56.86	3.53	.81					.5	7,984	14,371
Same (composite of samples 21650, 21651, and 21652)	21653	B	1	2.12	36.59	57.46	3.83	.77	5.50	79.71	1.92	8.27	.6	7,962	14,332
			2		37.38	58.71	3.91	.79	5.38	81.44	1.96	6.52		8,135	14,643
			3		38.90	61.10		.82	5.60	84.75	2.04	6.79		8,466	15,239
Cotula, 2,000 feet west of; Southern mine, Jordan bed (4 room, A entry, 1,200 feet S. 20° W. of mine mouth).	21687	B	1	4.44	36.69	54.81	4.06	1.35					1.8	7,489	13,480
Same (face of 1 room, main entry, 75 feet southwest of mouth of E entry, 1,700 feet S. 60° W. of mine mouth).	21688	B	1	4.25	37.49	55.46	2.80	.98					1.8	7,633	13,739
Same (composite of samples 21687 and 21688)	21689	B	1	4.29	37.12	55.07	3.52	1.19	5.63	76.72	1.84	11.10	1.8	7,588	13,658
			2		38.78	57.54	3.68	1.24	5.38	80.16	1.92	7.62		7,928	14,270
			3		40.26	59.74		1.29	5.59	83.22	1.99	7.91		8,231	14,816
1 mile south of; Wynn mine, Rich Mountain bed (face of 36 room, 2 left entry, 250 feet west, 4,000 feet south, and 50 feet west of mine mouth).	21690	B	1	3.95	38.88	55.20	1.97	.79					1.7	7,777	13,999
Same (face of 5 right entry, 1,000 feet west, 1,300 feet south, 400 feet west, and 250 feet north of mine mouth).	21691	B	1	3.82	39.22	54.70	2.26	.89					1.7	7,768	13,982
Same (face of main entry, 1,000 feet west, 1,300 feet south, and 650 feet west of mine mouth).	21692	B	1	3.84	38.78	55.54	1.84	.80					1.6	7,794	14,029
Same (composite of samples 21690, 21691, and 21692)	21693	B	1	3.96	38.80	55.17	2.07	.86	5.75	78.49	1.95	10.88	1.7	7,780	14,004
			2		40.40	57.44	2.16	.90	5.53	81.72	2.03	7.66		8,101	14,582
			3		41.29	58.71		.92	5.65	83.53	2.07	7.83		8,280	14,904
Elk Valley, ¾ mile north-northwest of; Elkhart mine, Blue Gem bed (face of 2 left entry, 1,200 feet west-southwest of mine mouth).	22015	B	1	4.33	38.28	55.64	1.75	1.11					1.6	7,802	14,044
Same (face of 8 room, 2 left entry, 700 feet west-southwest of mine mouth).	22016	B	1	5.19	37.29	54.97	2.55	1.30					2.3	7,650	13,770
Same (composite of samples 22015 and 22016)	22017	B	1	4.64	37.98	55.25	2.13	1.19	5.72	77.51	2.01	11.44	1.9	7,706	13,871
			2		39.83	57.94	2.23	1.25	5.45	81.28	2.11	7.68		8,081	14,546
			3		40.74	59.26		1.28	5.57	83.13	2.16	7.86		8,265	14,877
1 mile northwest of; Elk Valley mine, Blue Gem bed (face of main entry, 900 feet north of mine mouth).	22018	B	1	3.96	38.42	55.64	1.98	1.01					1.2	7,797	14,035
Same (face of mud entry, 300 feet north-northeast of mine mouth)	22019	B	1	3.95	39.53	53.91	2.61	.96					1.5	7,782	14,008
Same (composite of samples 22018 and 22019)	22020	B	1	3.92	39.06	54.70	2.32	.96	5.77	78.03	2.10	10.82	1.4	7,774	13,993
			2		40.65	56.94	2.41	1.00	5.55	81.21	2.19	7.64		8,091	14,564
			3		41.65	58.35		1.02	5.69	83.22	2.24	7.83		8,291	14,924
1⅛ miles northwest of; Perkins Branch mine, Blue Gem bed (face of 1 right entry, 700 feet west of mine mouth).	22012	B	1	3.49	39.16	55.27	2.08	1.03					1.1	7,856	14,141
Same (face of 2 right entry, 700 feet west-southwest of mine mouth).	22013	B	1	3.62	39.81	54.72	1.85	.96					1.0	7,850	14,130
Same (composite of samples 22012 and 22013)	22014	B	1	3.50	39.73	54.71	2.06	1.03	5.77	78.70	2.00	10.44	1.1	7,876	14,177
			2		41.17	56.70	2.13	1.07	5.58	81.56	2.07	7.59		8,162	14,692
			3		42.07	57.93		1.09	5.70	83.34	2.12	7.75		8,340	15,012
Habersham, ½ mile north of; Davis Creek mine, Jellico bed (face of 3 right entry, 1,500 feet southeast and 300 feet southwest of mine mouth).	21825	B	1	4.10	37.04	55.02	3.84	1.25					2.1	7,639	13,750
			2		38.63	57.37	4.00	1.30						7,966	14,339
			3		40.24	59.76		1.35						8,298	14,936
Same; Old Davis Creek mine, Jellico bed (face of 5 left entry, 1,650 feet southeast and 250 feet northeast of mine mouth).	21826	B	1	3.88	36.05	53.51	6.56	1.44					2.0	7,406	13,331
			2		37.51	55.66	6.83	1.50						7,705	13,869
			3		40.26	59.74		1.61						8,270	14,886
2 miles southeast of; Remy mine, Rich Mountain bed (face of 12 right entry, 3,100 feet from mine mouth).	21802	B	1	4.41	37.95	55.13	2.51	.69					2.2	7,720	13,896

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
TENNESSEE—Continued.																
CAMPBELL COUNTY—continued.																
Habersham, ½ mile north of: Davis Creek mine, Jellico bed (face of 13 left entry, 3,400 feet from mine mouth).	.....	21803	B	1	3.75	38.98	54.77	2.50	.68	.....	.....	.....	.....	1.6	7,753	13,955
Same (face of 11½ left entry, 2,800 feet from mine mouth)	.....	21804	B	1	4.22	38.70	55.52	1.56	.68	.....	.....	.....	.....	2.1	7,822	14,080
Same (composite of samples 21802, 21803, and 21804)	.....	21805	B	1	4.06	38.57	55.15	2.22	.72	5.87	77.88	2.01	11.30	2.0	7,766	13,979
				2	.....	40.20	57.49	2.31	.75	5.65	81.17	2.10	8.02	.....	8,095	14,571
				3	.....	41.15	58.85	.....	.77	5.78	83.08	2.15	8.22	.....	8,286	14,915
1 mile east of: Rich Mountain mine, Rich Mountain bed (face of 7 left entry, 2,150 feet S. 30° E. and 800 feet N. 60° E. of mine mouth).	.....	21806	B	1	3.71	37.89	53.81	4.59	2.23	.....	.....	.....	.....	1.6	7,595	13,671
Same (face of 4 left entry, 1,200 feet S. 30° E. and 1,300 feet N. 60° E. of mine mouth).	.....	21807	B	1	3.55	38.81	53.90	3.74	1.50	.....	.....	.....	.....	1.6	7,650	13,770
Same (face of 8 right entry, 2,450 feet S. 30° E. and 400 feet S. 60° W. of mine mouth).	.....	21808	B	1	3.37	39.24	53.15	4.24	1.72	.....	.....	.....	.....	1.2	7,654	13,777
Same (face of 9 left entry, 2,650 feet S. 30° E. and 200 feet N. 60° E. of mine mouth).	.....	21809	B	1	3.81	37.88	53.71	4.60	2.12	.....	.....	.....	.....	1.5	7,567	13,621
Same (composite of samples 21806, 21807, 21808, and 21809)	.....	21810	B	1	3.63	38.70	53.38	4.29	1.88	5.78	76.49	1.96	9.60	1.5	7,627	13,729
				2	.....	40.16	55.39	4.45	1.95	5.58	79.37	2.03	6.62	.....	7,915	14,247
				3	.....	42.03	57.97	.....	2.04	5.84	83.07	2.12	6.93	.....	8,284	14,909
Jellico, 1½ miles east-southeast of: Black mine, Blue Gem bed (face of main entry, 300 feet north-northeast of mine mouth).	.....	22000	B	1	4.61	38.47	52.96	3.96	1.11	.....	.....	.....	.....	1.7	7,487	13,477
				2	.....	40.33	55.52	4.15	1.16	.....	.....	.....	.....	.....	7,849	14,128
				3	.....	42.08	57.92	.....	1.21	.....	.....	.....	.....	.....	8,189	14,740
1 mile south of: Blue Gem mine, Blue Gem bed (face of Pine Mountain left entry, 160 feet southeast of mine mouth).	.....	21924	B	1	4.92	39.56	53.71	1.81	1.06	.....	.....	.....	.....	2.0	7,614	13,705
Same (face of Pine Mountain right entry, 200 feet southwest of mine mouth).	.....	21925	B	1	4.42	39.58	54.13	1.87	.95	.....	.....	.....	.....	1.4	7,647	13,765
Same (face of 2 right entry, Crouch Creek entry, 450 feet west of entry mouth).	.....	21926	B	1	4.18	39.81	53.57	2.44	.93	.....	.....	.....	.....	1.3	7,612	13,702
Same (composite of samples 21924, 21925, and 21926)	.....	21927	B	1	4.40	39.53	54.03	2.04	1.00	5.81	76.45	2.01	12.69	1.6	7,622	13,720
				2	.....	41.35	56.52	2.13	1.05	5.56	79.97	2.10	9.19	.....	7,973	14,351
				3	.....	42.25	57.75	.....	1.07	5.68	81.71	2.15	9.39	.....	8,147	14,665

½ mile east of; Braughton mine, Blue Gem bed (face of main entry, 1,600 feet south-southeast of mine mouth).	21836	B	1	4.40	39.65	53.69	2.26	1.00					2.0	7,640	13,752
Same (face of last room, main entry, 1,200 feet southeast of mine mouth).	21837	B	1	4.47	38.43	55.29	1.81	.86					2.2	7,663	13,793
Same (composite of samples 21836 and 21837)	21838	B	1	4.56	38.93	54.46	2.05	.95	5.96	77.04	1.96	12.04	2.1	7,664	13,795
			2		40.79	57.06	2.15	1.00	5.71	80.72	2.05	8.37		8,030	14,454
			3		41.69	58.31		1.02	5.84	82.50	2.10	8.54		8,207	14,773
1½ miles south of; Evans mine, Blue Gem bed (face of 10 room, 3 left entry, 300 feet south of mine mouth).	22001	B	1	5.48	37.97	54.40	2.15	.81					2.3	7,583	13,649
Same (face of 7 room, 4 left entry, 600 feet southwest of mine mouth).	22002	B	1	5.12	38.67	54.61	1.60	.85					1.7	7,654	13,777
Same (composite of samples 22001 and 22002)	22003	B	1	5.19	38.10	54.79	1.92	.83	5.89	76.34	2.10	12.92	2.0	7,627	13,729
			2		40.18	57.79	2.03	.88	5.60	80.52	2.21	8.76		8,044	14,479
			3		41.01	58.99		.90	5.72	82.19	2.26	8.93		8,211	14,780
2½ miles west of; Indian Mountain No. 3 mine, Jellico bed (rib at mouth of Short Dog entry, 3 main entry, 1,000 feet southwest of mouth of mine).	21831	B	1	4.50	35.97	57.04	2.49	1.08					2.2	7,641	13,754
			2		37.66	59.73	2.61	1.13						8,001	14,402
			3		38.67	61.33		1.16						8,215	14,787
Same: Indian Mountain No. 1 mine (face of 4 left entry, 1 main entry, 900 feet southeast of mouth of mine).	21832	B	1	4.46	37.74	55.73	2.07	.75					2.0	7,738	13,928
Same: Indian Mountain No. 2 mine (face of 2 left entry, 2 main entry, 700 feet southeast of mouth of mine).	21833	B	1	4.82	36.64	55.25	3.29	1.41					2.3	7,583	13,649
Same: Indian Mountain No. 5 mine (face of 4 entry, 5 main entry, 1,200 feet southeast of mouth of mine).	21834	B	1	4.76	38.10	53.04	4.10	2.01					2.4	7,497	13,495
Same (composite of samples 21832, 21833, and 21834)	21835	B	1	4.69	36.83	55.32	3.16	1.36	5.78	76.39	2.00	11.31	2.2	7,599	13,678
			2		38.64	58.04	3.32	1.43	5.52	80.15	2.10	7.48		7,973	14,351
			3		39.97	60.03		1.48	5.71	82.90	2.17	7.74		8,246	14,843
3 miles south of; Jameson Blue Gem mine, Blue Gem bed (rib, 150 feet north of mouth of 10 main entry).	21998	B	1	4.59	39.22	53.93	2.26	1.20					1.3	7,588	13,658
			2		41.11	56.52	2.37	1.26						7,953	14,315
			3		42.11	57.89		1.29						8,146	14,663
Same (face of 13 main entry, 650 feet south of mine mouth)	21999	B	1	5.22	37.80	54.62	2.36	.91					1.9	7,550	13,590
			2		39.88	57.63	2.49	.96						7,966	14,339
			3		40.90	59.10		.98						8,169	14,704
Kilsyth, 2 miles northeast of; Gem No. 2 mine, Jordan bed (face of 2 room, 7 left entry, 1,450 feet N. 23° W., 1,300 feet N. 11° W., 180 feet S. 39° W., and 150 feet S. 11° E. of mine mouth).	21696	B	1	4.03	37.54	55.65	2.78	.76					1.6	7,639	13,750
Same (face of 8 right entry, 1,450 feet N. 23° W., 1,850 feet N. 11° W., and 150 feet N. 39° E. of mine mouth).	21697	B	1	4.59	36.29	55.62	3.50	.74					2.0	7,541	13,574
2 miles northeast of; Gem No. 4 mine, Jordan bed (face of 2 right entry 600 feet N. 11° W., and 550 feet N. 39° W. of mine mouth).	21694	B	1	4.22	36.27	56.52	2.99	.64					1.8	7,623	13,721
Same (face of 3 left entry, 1,050 feet N. 11° W. and 175 feet S. 79° W. of mine mouth).	21695	B	1	4.40	35.96	56.64	3.00	.69					2.00	7,576	13,637
Same (composite of samples 21694, 21695, 21696, and 21697)	21698	B	1	4.32	36.71	55.88	3.09	.71	5.58	77.38	1.93	11.31	1.9	7,595	13,671
			2		38.37	58.40	3.23	.74	5.33	80.88	2.02	7.80		7,938	14,288
			3		39.65	60.35		.76	5.51	83.59	2.09	8.05		8,203	14,765
Kimberly, ½ mile east of; Kimberly mine, Rich Mountain bed (face of 10 left entry).	21821	B	1	4.88	39.14	51.85	4.13	2.22					2.8	7,519	13,534
Same (face of 3 right entry, new main entry)	21822	B	1	3.95	39.65	51.23	5.17	1.45					1.8	7,531	13,556
Same (face of 2 right entry, new main entry)	21823	B	1	4.05	39.34	52.24	4.37	1.76					1.9	7,594	13,669
Same (composite of samples 21821, 21822, and 21823)	21824	B	1	4.26	39.67	51.49	4.58	1.79	5.79	74.74	1.94	11.16	2.2	7,555	13,599
			2		41.44	53.78	4.78	1.87	5.56	78.07	2.03	7.69		7,891	14,204
			3		43.52	56.48		1.96	5.84	81.99	2.13	8.08		8,287	14,917

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
TENNESSEE—Continued.																
CAMPBELL COUNTY—continued.																
La Follette, 2 miles northeast of; Rex No. 1 mine, Rex bed (face of 1 main entry).	.....	17555	A	1	2.87	36.87	57.13	3.13	0.82	.....	.....	.....	.....	0.6	7,865	14,157
Same (face of 18 right entry, 1 right main entry)	.....	17556	A	1	2.84	34.68	55.02	7.46	.88	.....	.....	.....	.....	.5	7,447	13,405
Same (face of 15 right entry)	.....	17557	A	1	2.84	32.95	50.64	13.57	.88	.....	.....	.....	.....	.6	6,890	12,402
Same (composite of samples of 17555, 17556, and 17557)	.....	17558	A	1	2.77	34.95	54.18	8.10	.88	5.06	74.11	1.96	9.89	.6	7,403	13,325
				2	.....	35.95	55.72	8.33	.91	4.89	76.22	2.02	7.63	.....	7,614	13,705
				3	.....	39.22	60.78	.....	.99	5.33	83.15	2.20	8.33	.....	8,306	14,951
Same (face of 1 left entry, 4,500 feet N. 37° W., 1,325 feet N. 24° E., and 800 feet N. 66° W. of mine mouth).	.....	21699	B	1	3.17	37.55	56.30	2.98	1.13	.....	.....	.....	.....	1.3	7,789	14,020
Same (face of main entry, 4,500 feet N. 37° W., and 2,550 feet N. 66° W., of mine mouth).	.....	21700	B	1	2.97	37.84	55.78	3.41	.78	.....	.....	.....	.....	1.0	7,822	14,080
Same (face of 2 right entry, 2,400 feet N. 37° W., 2,125 feet N. 53° E., 1,875 feet N. 24° E., and 1,775 feet S. 66° E. of mine mouth).	.....	21701	B	1	3.32	37.13	55.90	3.65	1.49	.....	.....	.....	.....	1.1	7,685	13,833
Same (face of 2 left main entry, 2,400 feet N. 37° W., 2,125 feet N. 53° E., 1,875 feet N. 24° E., and 2,900 feet N. 66° W. of mine mouth).	.....	21702	B	1	3.23	37.51	56.60	2.66	.89	.....	.....	.....	.....	1.1	7,834	14,101
Same (composite of samples 21699, 21700, 21701, and 21702)	.....	21703	B	1	3.12	37.40	56.25	3.23	1.04	5.62	78.56	1.96	9.59	1.1	7,785	14,013
				2	.....	38.60	58.07	3.33	1.07	5.44	81.09	2.02	7.05	.....	8,036	14,465
				3	.....	39.93	60.07	.....	1.11	5.63	83.88	2.09	7.29	.....	8,312	14,962
1 mile northwest of; Rex No. 2 mine, Rex bed (face of 3 left main entry).	.....	17544	A	1	2.55	35.30	54.34	7.81	1.08	5.21	75.07	1.90	8.93	.3	7,454	13,417
				2	.....	36.22	55.77	8.01	1.11	5.06	77.04	1.95	6.83	.....	7,649	13,768
				3	.....	39.37	60.63	.....	1.21	5.50	83.75	2.12	7.42	.....	8,315	14,967
Same (face of 2 left main entry)	.....	17552	A	1	2.55	37.17	57.14	3.14	1.20	.....	.....	.....	.....	.4	7,880	14,184
Same (face of 6 right entry, 3 left main entry)	.....	17553	A	1	2.82	36.75	54.61	5.82	1.03	.....	.....	.....	.....	.5	7,587	13,657
Same (composite of samples 17552 and 17553)	.....	17554	A	1	2.64	36.19	56.69	4.48	1.13	5.44	78.31	1.94	8.70	.5	7,745	13,941
				2	.....	37.17	58.23	4.60	1.16	5.29	80.43	1.99	6.53	.....	7,955	14,319
				3	.....	38.96	61.04	.....	1.22	5.54	84.31	2.09	6.84	.....	8,338	15,008
Morley, 1½ miles southeast of; Red Moon mine, Jellico bed (face of 3 main south entry, 1,900 feet southwest of mine mouth).	.....	21827	B	1	3.37	38.15	54.10	4.38	1.81	.....	.....	.....	.....	1.5	7,675	13,815

Same (face of 3 main north entry, 1,800 feet southwest of mine mouth).	21828	B	1	4.26	37.31	52.84	5.59	2.50					2.5	7,499	13,498
Same (face of 1 right entry, 1,950 feet southwest of mine mouth)	21829	B	1	3.33	38.27	53.71	4.69	1.16					1.4	7,654	13,777
Same (composite of samples 21827, 21828, and 21829)	21830	B	1	3.60	37.93	53.62	4.85	1.82	5.65	76.08	1.90	9.70	1.8	7,596	13,673
			2		39.34	55.63	5.03	1.89	5.45	78.92	1.97	6.74		7,879	14,182
			3		41.43	58.57		1.99	5.74	83.10	2.07	7.10		8,297	14,935
Newcomb, 1½ miles west of; Brummitt mine, Blue Gem bed (rib of main entry, 100 feet west of mine mouth).	21996	B	1	5.14	36.98	56.19	1.69	.81					1.8	7,642	13,756
			2		38.98	59.24	1.78	.85						8,056	14,501
			3		39.69	60.31		.87						8,202	14,764
2 miles west of; Jellico Cannel mine (rib on main entry, opposite 3 left entry, 300 feet north-northeast, and 720 feet west-northwest of mine mouth).	21997	B	1	1.50	45.06	34.13	19.31	1.16					.5	6,855	12,339
			2		45.74	34.66	19.60	1.18						6,959	12,526
			3		56.89	43.11		1.47						8,656	15,581
3 miles north-northwest of; Marion-Anna mine, Jellico bed (face of 1 right entry, 3,000 feet west of mine mouth).	22004	B	1	3.11	37.58	52.97	6.34	2.24					1.0	7,455	13,419
Same (pillar, T right entry, 3,200 feet west-northwest of mine mouth).	22005	B	1	3.23	37.38	53.35	6.04	1.73					.9	7,460	13,428
Same (pillar, 3 main entry, 3,400 feet west-northwest of mine mouth).	22006	B	1	2.99	38.12	53.45	5.44	1.49					1.0	7,533	13,559
Same (composite of samples 22004, 22005, and 22006)	22007	B	1	3.21	37.56	53.30	5.93	1.85	5.52	75.25	1.96	9.49	1.0	7,487	13,477
			2		38.81	55.06	6.13	1.91	5.33	77.75	2.03	6.85		7,736	13,925
			3		41.34	58.66		2.03	5.68	82.83	2.16	7.30		8,241	14,834
1½ miles northeast of; old Italian Blue Gem mine, Blue Gem bed (face of Ben Vicar entry, 4 right entry, 875 feet east-southeast, 190 feet south-southwest, and 150 feet west-northwest of mine mouth).	21928	B	1	5.12	37.69	54.10	3.09	.85					2.0	7,428	13,370
Same (face of 3 left entry, old main entry, 775 feet east-northeast, and 800 feet north-northeast of mine mouth).	21929	B	1	5.67	36.76	55.90	1.67	.96					2.1	7,506	13,511
Same (composite of samples 21928 and 21929)	21930	B	1	5.39	37.46	54.76	2.39	.89	5.76	75.23	1.99	13.74	2.0	7,468	13,442
			2		39.60	57.87	2.53	.94	5.45	79.52	2.10	9.46		7,894	14,209
			3		40.63	59.37		.96	5.59	81.59	2.15	9.71		8,099	14,578
1½ miles north of; Washington Blue Gem mine, Blue Gem bed (face of 6 break-through, main tunnel entry, 700 feet west-southwest of mine mouth).	21931	B	1	4.83	36.95	56.48	1.74	.87					2.5	7,705	13,869
Same (face of 1 left entry, 800 feet west-southwest of mine mouth)	21932	B	1	4.19	38.34	55.73	1.74	.77					1.8	7,740	13,932
Same (composite of samples 21931 and 21932)	21933	B	1	4.52	37.76	56.06	1.66	.79	5.81	78.47	2.06	11.21	2.1	7,723	13,901
			2		39.55	58.71	1.74	.83	5.56	82.18	2.16	7.53		8,089	14,560
			3		40.25	59.75		.84	5.66	83.63	2.20	7.67		8,232	14,818
2½ miles west of; Zechini mine, Jellico bed (face of Vaughn entry, 500 feet N., 20° W. of mine mouth).	22008	B	1	4.21	37.30	52.89	5.60	.85					1.7	7,438	13,388
Same (face of main east entry, 400 feet N., 65° W. of mine mouth).	22009	B	1	4.49	37.87	53.89	3.75	.80					2.1	7,587	13,657
Same (face of main west entry, 500 feet N. 55° W of mine mouth).	22010	B	1	4.99	36.37	53.39	5.25	.83					2.5	7,416	13,349
Same (composite of samples 22008, 22009, and 22010)	22011	B	1	4.56	36.82	53.74	4.88	.83	5.57	75.59	1.77	11.36	2.1	7,492	13,486
			2		38.58	56.31	5.11	.87	5.30	79.20	1.85	7.67		7,850	14,130
			3		40.66	59.34		.92	5.59	83.47	1.95	8.07		8,273	14,891
Oswego, 2½ miles northwest of; Falls Branch mine, Jellico bed (mouth of 1 room, 49½ entry, 2,500 feet northeast, 550 feet northwest, and 350 feet northeast of mine mouth).	21839	B	1	4.27	38.18	55.56	1.99	.97					2.1	7,736	13,925
			2		39.88	58.04	2.08	1.01						8,081	14,546
			3		40.73	59.27		1.03						8,252	14,854
Same (face of 1 room, 39 right entry, 2,500 feet northeast, 375 feet southeast, 125 feet northeast, and 100 feet southeast of mine mouth).	21840	B	1	3.84	38.43	55.67	2.06	.92					1.8	7,763	13,973

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
TENNESSEE—Continued.																
CAMPBELL COUNTY—continued.																
Oswego, 2½ miles northwest of; Falls Branch mine, Jellico bed (face of 59 entry, 1,000 feet northeast, 1,200 feet northwest, and 800 feet northeast of mine mouth).	.....	21841	B	1	3.71	38.54	54.43	3.32	1.27	.....	.....	.....	.....	1.9	7,660	13,788
Same (face of 58 entry, 1,000 feet northeast, 1,550 feet northwest, and 900 feet northeast of mine mouth).	.....	21842	B	1	3.78	37.79	54.87	3.56	1.16	.....	.....	.....	.....	2.0	7,641	13,754
Same (composite of samples 21840, 21841, and 21842)	.....	21843	B	1	3.87	38.03	55.18	2.92	1.09	5.76	77.23	1.97	11.03	1.9	7,686	13,835
				2	.....	39.56	57.40	3.04	1.13	5.54	80.34	2.05	7.90	.....	7,996	14,393
				3	.....	40.80	59.20	.....	1.17	5.71	82.86	2.11	8.45	.....	8,247	14,845
½ mile northwest of; Powhatan mine, Blue Gem bed (face of 10 entry, 3,100 feet northwest of mine mouth).	.....	21871	B	1	4.40	37.71	55.82	2.07	.81	.....	.....	.....	.....	1.5	7,668	13,802
Same (face of 10 room, 9 entry, 2,700 feet north-northwest of mine mouth).	.....	21872	B	1	4.29	38.69	55.28	1.74	.88	.....	.....	.....	.....	1.4	7,708	13,874
Same (composite of samples 21871 and 21872)	.....	21873	B	1	4.40	37.96	55.72	1.92	.85	5.79	77.67	2.12	11.65	1.5	7,712	13,882
				2	.....	39.71	58.28	2.01	.89	5.54	81.24	2.22	8.10	.....	8,067	14,521
				3	.....	40.52	59.48	.....	.91	5.65	82.91	2.27	8.26	.....	8,232	14,818
Turley, 1⅛ miles southwest of; Rock Springs mine, Upper Dean bed (face 2 main entry, 2,500 feet west-southwest of mine mouth).		22021	B	1	3.24	36.68	48.49	11.59	2.78	.....	.....	.....	.....	1.6	6,986	12,575
Same (face of 4 right entry, 2,000 feet west of mine mouth)	.....	22022	B	1	3.60	37.03	48.01	11.36	2.92	.....	.....	.....	.....	1.9	7,009	12,616
Same (face of 8 room, 2 left entry, 1,800 feet southwest of mine mouth).	.....	22023	B	1	3.49	37.13	47.52	11.86	2.86	.....	.....	.....	.....	1.6	6,952	12,514
Same (composite of samples 22021, 22022, and 22023)	.....	22024	B	1	3.53	36.58	48.35	11.54	2.80	5.17	69.81	1.30	9.38	1.7	6,996	12,593
				2	.....	37.92	50.12	11.96	2.90	4.95	72.37	1.35	6.47	.....	7,252	13,054
				3	.....	43.07	56.93	.....	3.29	5.62	82.20	1.53	7.36	.....	8,237	14,827
Vasper, 1½ miles southwest of; Disney mine, Frozen Head (?) bed (rib in main entry, 150 feet south of opening).	.....	21664	B	1	4.72	37.48	54.03	3.77	.69	.....	.....	.....	.....	2.2	7,554	13,597
				2	.....	39.34	56.70	3.96	.72	.....	.....	.....	.....	.....	7,928	14,270
				3	.....	40.96	59.04	.....	.75	.....	.....	.....	.....	.....	8,255	14,859
½ mile west of; Vasper mine, Coal Creek bed (face of main entry, 1,400 feet southwest of mine mouth).	.....	21665	B	1	2.10	37.08	56.42	4.40	1.47	.....	.....	.....	.....	.6	7,823	14,081
Same (face of 1 right entry, main entry, 800 feet west, and 260 feet north of mine mouth).	.....	21666	B	1	1.74	38.15	56.20	3.91	.85	.....	.....	.....	.....	.3	7,901	14,222
Same (composite of samples 21665 and 21666)	.....	21667	B	1	1.95	37.66	56.30	4.09	1.23	5.49	79.27	1.94	7.98	.4	7,877	14,179
				2	.....	38.41	57.42	4.17	1.25	5.37	80.85	1.98	6.38	.....	8,034	14,461
				3	.....	40.08	59.92	.....	1.30	5.60	84.37	2.07	6.66	.....	8,383	15,089

CLAIBORNE COUNTY.																
Bosworth (Ky.), 2,500 feet southwest of; Yellow Creek No. 3 mine, Billygoat bed (chain pillar, 2 right entry, 600 feet S. 30° E. of mine mouth).	.....	22087	B	1	3.89	39.70	53.28	3.13	1.08	.....	.....	.....	.....	2.2	7,831	14,096
Same (face of 4 right entry, 1,150 feet S. 25° E. of mine mouth).	.....	22088	B	1	3.39	38.85	54.51	3.25	1.05	.....	.....	.....	.....	1.5	7,885	14,193
Same (face of main entry, 1,500 feet S. 45° E. of mine mouth)	.....	22089	B	1	3.23	40.23	55.04	1.50	1.03	.....	.....	.....	.....	1.3	8,058	14,504
Same (face of 5 left entry, 1,250 feet S. 70° E. of mine mouth)	.....	22090	B	1	2.90	39.95	54.13	3.02	1.11	.....	.....	.....	.....	1.1	7,942	14,296
Same (composite of samples 22087, 22088, 22089, and 22090)	.....	22091	B	1	3.34	39.87	54.02	2.77	1.03	5.86	79.29	2.11	8.94	1.5	7,939	14,290
				2	.....	41.25	55.88	2.87	1.07	5.68	82.03	2.18	6.17	.....	8,214	14,785
				3	.....	42.47	57.53	.....	1.10	5.85	84.45	2.24	6.36	.....	8,456	15,221
Bryson; Bryson Mountain No. 1 mine, Mingo bed (16 stump, 3 cross entry, 3,400 feet S. 70° W. of mine mouth).	.....	22106	B	1	3.44	37.65	54.68	4.23	1.13	.....	.....	.....	.....	1.6	7,684	13,831
Same (chain pillar, 1 cross entry, 2,600 feet S. 45° W. of mine mouth).	.....	22107	B	1	3.56	36.72	53.92	5.80	1.61	.....	.....	.....	.....	1.7	7,548	13,586
Same (chain pillar, 5 cross entry, 3,800 feet S. 85° W. of mine mouth).	.....	22108	B	1	3.81	37.22	54.69	4.28	1.18	.....	.....	.....	.....	1.7	7,652	13,774
Same (composite of samples 22106, 22107, and 22108)	.....	22109	B	1	3.55	37.35	54.29	4.81	1.35	5.65	76.33	1.69	10.17	1.7	7,613	13,703
				2	.....	38.72	56.29	4.99	1.40	5.45	79.14	1.75	7.27	.....	7,893	14,207
				3	.....	40.75	59.25	.....	1.47	5.74	83.29	1.84	7.66	.....	8,307	14,953
½ mile southwest of; Bryson Mountain No. 2 mine, Poplar Lick bed (rib sample from main entry, 500 feet west of mine mouth).	.....	22105	B	1	3.43	38.56	50.51	7.50	2.61	.....	.....	.....	.....	1.8	7,383	13,289
				2	.....	39.93	52.30	7.77	2.70	.....	.....	.....	.....	.....	7,645	13,761
				3	.....	43.29	56.71	.....	2.93	.....	.....	.....	.....	.....	8,289	14,920
Clairfield, ¾ mile east of; King Mountain mine, Jellico bed (face of 3 room, 3 left entry, 1 left entry, 1,000 feet S. 50° E. of mine mouth).	.....	21849	B	1	3.05	36.38	57.93	2.64	.69	.....	.....	.....	.....	1.4	7,882	14,188
Same (face of 1 room, 2 left entry, 1 right main entry, 1,850 feet S. 30° W. of mine mouth).	.....	21850	B	1	2.88	37.47	53.15	6.50	2.20	.....	.....	.....	.....	1.4	7,569	13,624
Same (face of 4 room, 1 left entry, 1 left main entry, 700 feet S. 25° E. of mine mouth).	.....	21851	B	1	3.07	36.88	57.39	2.66	.78	.....	.....	.....	.....	1.4	7,901	14,222
Same (composite of samples 21849, 21850, and 21851)	.....	21852	B	1	2.99	37.15	55.92	3.94	1.16	5.56	78.50	1.93	8.91	1.4	7,792	14,026
				2	.....	38.29	57.65	4.06	1.20	5.39	80.92	1.99	6.44	.....	8,032	14,458
				3	.....	39.91	60.09	.....	1.25	5.62	84.34	2.07	6.72	.....	8,372	15,070
1 mile east of; Standard mine, Jellico bed (17 room neck, 1-C entry, 825 feet N. 5° W. of mine mouth).	.....	21867	B	1	3.23	37.18	57.08	2.51	.89	.....	.....	.....	.....	1.5	7,910	14,238
Same (face of 20 room, 3-D entry, 2,100 feet N. 15° E. of mine mouth).	.....	21868	B	1	2.99	38.89	54.66	3.46	.90	.....	.....	.....	.....	1.2	7,843	14,117
Same (face of 3-C entry, 1,100 feet N. 30° W., of mine mouth)	.....	21869	B	1	2.81	36.43	57.12	3.64	1.01	.....	.....	.....	.....	1.0	7,825	14,085
Same (composite of samples 21867, 21868, and 21869)	.....	21870	B	1	2.94	37.69	56.15	3.22	.90	5.60	79.10	1.96	9.22	1.2	7,867	14,161
				2	.....	38.83	57.85	3.32	.93	5.43	81.50	2.02	6.80	.....	8,105	14,589
				3	.....	40.16	59.84	.....	.96	5.62	84.30	2.09	7.03	.....	8,383	15,089
Eagan, ¾ mile south of; Buffalo mine, Jellico bed (face of 9 main entry, 3,250 feet south of mine mouth).	.....	21862	B	1	3.17	37.48	56.73	2.62	.67	.....	.....	.....	.....	1.4	7,936	14,285
Same (face of 10 right entry, 2,400 feet south, and 1,050 feet west of mine mouth).	.....	21863	B	1	3.02	38.12	54.61	4.25	1.72	.....	.....	.....	.....	1.1	7,770	13,986
Same (face of 8 right entry, 2,000 feet south, and 1,500 feet west of mine mouth).	.....	21864	B	1	2.93	37.90	56.11	3.06	.69	.....	.....	.....	.....	1.1	7,902	14,224
Same (face of 6 right entry, 1,500 feet south, and 1,600 feet west of mine mouth).	.....	21865	B	1	3.40	37.73	55.13	3.74	1.54	.....	.....	.....	.....	1.5	7,777	13,999
Same (composite of samples 21862, 21863, 21864, and 21865)	.....	21866	B	1	3.12	37.84	55.65	3.39	1.19	5.62	78.49	1.99	9.32	1.3	7,841	14,114
				2	.....	39.06	57.44	3.50	1.23	5.44	81.02	2.05	6.76	.....	8,093	14,567
				3	.....	40.48	59.52	.....	1.27	5.64	83.96	2.12	7.01	.....	8,386	15,095

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
TENNESSEE—Continued.																
CLAIBORNE COUNTY—continued.																
Fork Ridge, ⅝ mile southwest of; Fork Ridge No. 1 mine, Mingo bed (face of 17 room, 1 right entry, 9,200 feet S. 45° E. of mine mouth).	.....	22114	B	1	5.22	38.03	54.85	1.90	0.95	.....	.....	.....	.....	2.5	7,651	13,772
Same (face of 11 room, 2 right entry, 8,900 feet S. 43° E. of mine mouth).	.....	22115	B	1	3.09	37.24	54.54	5.13	1.34	.....	.....	.....	.....	1.3	7,647	13,765
Same (face of 11 room, 3 left entry, 8,850 feet S. 48° E. of mine mouth).	.....	22116	B	1	3.15	36.79	52.98	7.08	1.45	.....	.....	.....	.....	1.2	7,476	13,457
Same (face of 15 room, 4 left entry, 9,300 feet S. 52° E. of mine mouth).	.....	22117	B	1	3.54	37.18	54.86	4.42	.97	.....	.....	.....	.....	1.8	7,660	13,788
Same (composite of samples 22114, 22115, 22116, and 22117)	.....	22118	B	1	3.85	36.61	54.90	4.64	1.19	5.61	76.38	1.87	10.31	1.7	7,607	13,693
				2	.....	38.07	57.10	4.83	1.24	5.39	79.44	1.94	7.16	.....	7,911	14,240
				3	.....	40.00	60.00	.....	1.30	5.66	83.48	2.04	7.52	.....	8,313	14,963
1½ miles southwest of; Fork Ridge No. 4 mine, Poplar Lick bed (face of 1 right entry, 1 face entry, 2,400 feet west, 350 feet north, and 200 feet east, of mine mouth).	.....	22110	B	1	3.37	36.74	52.99	6.90	.81	.....	.....	.....	.....	1.5	7,465	13,437
Same (face of main entry, 2,500 feet due west of mine mouth)	.....	22111	B	1	3.71	37.21	52.69	6.39	.76	.....	.....	.....	.....	1.7	7,461	13,430
Same (face of 2 cross entry, 2,400 feet west, and 600 feet south, of mine mouth).	.....	22112	B	1	3.39	37.48	53.38	5.75	.81	.....	.....	.....	.....	1.5	7,547	13,58
Same (composite of samples 22110, 22111, and 22112)	.....	22113	B	1	3.51	37.17	52.90	6.42	.84	5.62	75.19	1.91	10.02	1.6	7,473	13,451
				2	.....	38.52	54.83	6.65	.87	5.42	77.93	1.98	7.15	.....	7,745	13,941
				3	.....	41.26	58.74	.....	.93	5.81	83.48	2.12	7.66	.....	8,296	14,933
Hartranft, 1,500 feet southeast of; Mingo No. 5 mine, Poplar Lick bed (face of 21 left entry, 3,600 feet S. 45° E. of mine mouth)	.....	22097	B	1	3.05	36.86	51.05	9.04	2.75	.....	.....	.....	.....	1.2	7,254	13,057
Same (face of 11 right entry, 3,200 feet S. 5° W. of mine mouth)	.....	22098	B	1	3.06	38.20	50.20	8.54	2.59	.....	.....	.....	.....	1.1	7,313	13,163
Same (face of 19 right entry, 3,700 feet S. 10° E. of mine mouth)	.....	22126	B	1	2.96	37.13	49.67	10.24	3.02	.....	.....	.....	.....	1.1	7,140	12,852
Same (composite of samples 22097, 22098, and 22126)	.....	22099	B	1	2.89	37.66	50.17	9.28	2.73	5.53	72.66	1.70	8.10	1.1	7,247	13,045
				2	.....	38.78	51.66	9.56	2.81	5.37	74.83	1.75	5.68	.....	7,463	13,433
				3	.....	42.88	57.12	.....	3.11	5.94	82.74	1.93	6.28	.....	8,252	14,854
Reliance No. 2 mine, Mingo bed (barrier pillar, main air course, 2,700 feet S. 40° W. of mine mouth).	.....	22120	B	1	3.47	37.94	55.34	3.25	.93	.....	.....	.....	.....	1.5	7,806	14,051

Same (30 pillar, 27 right entry, 1,950 feet S. 25° W. of mine mouth).	22121	B	1	3.86	37.33	55.20	3.61	1.17					1.9	7,730	13,914
Same, Reliance No. 1 mine (new side track, 2 left entry, 500 feet N. 65° W. of mine mouth).	22122	B	1	3.69	37.19	54.56	4.56	1.39					1.9	7,697	13,855
Same (1 room, 3 left entry, 750 feet N. 70° W. of mine mouth).	22123	B	1	3.50	37.90	55.40	3.20	1.10					1.7	7,835	14,103
Same (composite of samples 22120, 22121, 22122, and 22123)	22124	B	1	3.62	37.32	55.43	3.63	1.10	5.70	78.28	1.70	9.59	1.7	7,765	13,977
			2	.....	38.72	57.51	3.77	1.14	5.50	81.22	1.76	6.61	.....	8,057	14,503
			3	.....	40.24	59.76	.....	1.18	5.72	84.40	1.83	6.87	.....	8,373	15,071
Sandstone Parting mine, Sandstone Parting bed (near face of 1 left entry, 500 feet S. 85° W. of mine mouth).	22119	B	1	5.00	34.01	51.17	9.82	1.20					3.1	7,079	12,742
			2	.....	35.80	53.86	10.34	1.26					.....	7,451	13,412
			3	.....	39.93	60.07	.....	1.41					.....	8,310	14,958
Manring, ½ mile west-southwest of; Sterling mine, Poplar Lick bed (face of 6 left entry, 2 face entry, 6,400 feet west, and 2,000 feet north, of mine mouth).	22100	B	1	3.30	36.21	52.32	8.17	.94					1.1	7,333	13,199
Same (face of 2 entry, 4 right entry, 2 face entry, 5,500 feet west, and 2,900 feet north, of mine mouth).	22101	B	1	3.36	34.47	53.17	9.00	.95					1.1	7,231	13,016
Same (face of 1 room, 2 right entry, 2 face entry, 4,500 feet west, and 2,800 feet north, of mine mouth).	22102	B	1	3.40	33.86	51.08	11.66	.88					1.2	6,967	12,541
Same (face of 1 room, 3 left entry, 2 face entry, 5,600 feet west, and 1,400 feet north, of mine mouth).	22103	B	1	3.46	36.48	52.04	8.02	.96					1.5	7,318	13,171
Same (composite of samples 22100, 22101, 22102, and 22103)	22104	B	1	3.41	35.49	51.87	9.23	.95	5.61	72.51	1.85	9.85	1.2	7,217	12,991
			2	.....	36.74	53.70	9.56	.98	5.41	75.07	1.92	7.06	.....	7,472	13,450
			3	.....	40.62	59.38	.....	1.08	5.98	83.00	2.12	7.82	.....	8,262	14,872
Pruden, ½ mile south of: High Cliff mine, Mingo bed (face of main entry, 3,300 feet S. 45° E. of mine mouth).	21857	B	1	3.32	37.82	54.28	4.58	1.15					1.5	7,690	13,842
Same (face of 5 room, 8 right entry, 2,900 feet S. 45° E., and 300 feet S. 45° W. of mine mouth).	21858	B	1	3.25	38.29	55.80	2.66	1.06					1.4	7,875	14,175
Same (face of 6 room, 7 right entry, 2,530 feet S. 45° E., and 400 feet S. 45° W. of mine mouth).	21859	B	1	3.20	39.40	54.39	3.01	1.31					1.4	7,860	14,148
Same (face of 5 room, 6 right entry, 2,160 feet S. 45° E., and 350 feet S. 45° W. of mine mouth).	21860	B	1	3.04	38.41	55.49	3.06	1.25					1.3	7,860	14,148
Same (composite of samples 21857, 21858, 21859, and 21860)	21861	B	1	3.16	38.31	55.15	3.38	1.19	5.66	78.10	1.94	9.73	1.4	7,815	14,067
			2	.....	39.56	56.95	3.49	1.23	5.48	80.65	2.00	7.15	.....	8,070	14,526
			3	.....	40.99	59.01	.....	1.27	5.68	83.57	2.07	7.41	.....	8,362	15,052
1 mile east of; Pruden mine, Mingo bed (face of 4 room, 7 left entry, 3 main entry, 1,900 feet east of mine mouth).	21844	B	1	3.04	36.70	53.86	6.40	1.77					1.5	7,520	13,536
Same (face of 9 room, 17 left entry, 1 main entry, 2,100 feet south of mine mouth).	21845	B	1	3.15	37.33	55.54	3.98	1.05					1.6	7,755	13,959
Same (face of 17 right entry, 1 main entry, 3,000 feet south of mine mouth).	21846	B	1	2.91	38.75	54.78	3.56	1.47					1.3	7,797	14,035
Same (face of 16 room, 5 right entry, 3 main entry, 1,300 feet south-southeast of mine mouth).	21847	B	1	3.04	37.17	55.40	4.39	1.34					1.4	7,740	13,932
Same (composite of samples 21844, 21845, 21846, and 21847)	21848	B	1	3.09	37.14	55.27	4.50	1.39	5.58	77.24	1.99	9.30	1.5	7,708	13,874
			2	.....	38.32	57.04	4.64	1.43	5.41	79.70	2.05	6.77	.....	7,954	14,317
			3	.....	40.19	59.81	.....	1.50	5.67	83.58	2.15	7.10	.....	8,341	15,014
FENTRESS COUNTY.															
Davidson, ⅝ mile north of; Davidson mine, Bon Air No. 2 bed (face of main entry, 200 feet northeast of opening).	20987	B	1	2.97	36.83	50.04	10.16	3.00					1.8	7,290	13,122
Same (face of main cross entry, 1,000 feet north-northeast of mine mouth).	20988	B	1	3.09	36.88	49.76	10.27	3.08					2.0	7,270	13,086

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
TENNESSEE—Continued.																
FENTRESS COUNTY—continued.																
Davidson, ½ mile north of: Davidson mine, Bon Air No. 2 bed (composite of samples 20987 and 20988).	.....	20989	B	1	3.12	36.55	50.10	10.23	3.04	5.49	71.96	1.44	7.84	1.9	7,274	13,093
				2	.....	37.73	51.71	10.56	3.14	5.31	74.28	1.49	5.22	.....	7,508	13,514
				3	.....	42.19	57.81	.....	3.51	5.94	83.05	1.67	5.83	.....	8,395	15,111
½ mile north of; Highland No. 2 mine, Bon Air No. 2 bed (face of main entry, 1,350 feet N. 41° E. of mine mouth).	.....	20982	B	1	2.97	37.30	50.19	9.54	2.76	.....	.....	.....	.....	1.8	7,330	13,194
Same (face of 2 right entry, 900 feet northeast of mine mouth)	.....	20983	B	1	2.83	36.60	51.81	8.76	2.97	.....	.....	.....	.....	1.6	7,393	13,307
Same face of 3 right entry, 1,300 feet east of mine mouth)	.....	20984	B	1	2.49	36.68	50.40	10.43	3.27	.....	.....	.....	.....	1.4	7,282	13,108
Same (composite of samples 20982, 20983, and 20984)	.....	20985	B	1	2.77	36.85	50.71	9.67	3.01	5.44	72.68	1.44	7.76	1.6	7,342	13,216
				2	.....	37.90	52.15	9.95	3.10	5.28	74.75	1.48	5.44	.....	7,551	13,593
				3	.....	42.09	57.91	.....	3.44	5.86	83.01	1.64	6.05	.....	8,385	15,092
Same (50 feet north of mouth of left entry 2 and about 1,000 feet N. 41° E. of opening).	.....	20986	B	1	2.67	37.25	50.24	9.84	3.66	.....	.....	.....	.....	1.6	7,329	13,192
				2	.....	38.27	51.62	10.11	3.76	.....	.....	.....	.....	.....	7,530	13,554
				3	.....	42.58	57.42	.....	4.18	.....	.....	.....	.....	.....	8,377	15,079
Wilder; Wilder No. 3 mine, Bon Air No. 2 bed (face of 19 right entry)	.....	24845	A	1	3.22	35.57	51.67	9.54	2.47	.....	.....	.....	.....	1.8	7,275	13,095
Same (face of 5 room, 3 left entry, cross heading)	.....	24846	A	1	3.16	35.97	50.89	9.98	2.89	.....	.....	.....	.....	1.8	7,252	13,054
Same (face of 27 room, 20 right entry)	.....	24847	A	1	3.36	35.67	51.49	9.48	2.47	.....	.....	.....	.....	2.0	7,290	13,122
Same (face of 14 left heading)	.....	24848	A	1	3.85	35.40	50.71	10.04	2.39	.....	.....	.....	.....	2.6	7,197	12,955
Same (face of 43 room, 7 left entry)	.....	24849	A	1	3.30	34.93	51.13	10.64	2.76	.....	.....	.....	.....	2.0	7,184	12,931
Same (composite of samples 24845, 24846, 24847, 24848, and 24849)	.....	24850	A	1	3.40	35.15	51.53	9.92	2.64	5.15	71.63	1.46	9.20	2.0	7,250	13,050
				2	.....	36.39	53.34	10.27	2.73	4.94	74.15	1.51	6.40	.....	7,505	13,509
				3	.....	40.56	59.44	.....	3.04	5.51	82.64	1.68	7.13	.....	8,364	15,055
GRUNDY COUNTY.																
Coalmont, ½ mile N. 15° W. of; Coalmont E mine, Sewanee bed (face of main entry, 500 feet east of mine mouth).	.....	22384	B	1	3.12	30.04	57.59	9.25	1.16	.....	.....	.....	.....	1.6	7,341	13,214
Same; Coalmont I mine, Sewanee bed (face of 11 room, 2 left entry, 1,140 feet N. 37° W., and 500 feet S. 55° W. of mouth).	.....	22383	B	1	3.14	30.15	54.50	12.21	.87	.....	.....	.....	.....	1.7	7,119	12,814
½ mile southeast of; Coalmont New A mine, Sewanee bed (room neck, main entry, 600 feet northeast of pit mouth).	.....	22385	B	1	2.60	29.57	54.98	12.85	1.18	.....	.....	.....	.....	1.0	7,070	12,726

½ mile southeast of; Coalmont Old A mine, Sewanee bed (room neck, main entry, 300 feet east of pit mouth).	22386	B	1	3.09	29.77	57.39	9.75	1.02					1.5	7,308	13,154
Same (composite of samples 22383, 22384, 22385, and 22386)	22387	B	1	2.87	29.75	56.37	11.01	1.10	4.76	73.30	1.52	8.31	1.4	7,218	12,992
			2		30.63	58.04	11.33	1.13	4.57	75.46	1.56	5.95		7,431	13,376
			3		34.54	65.46		1.27	5.15	85.10	1.76	6.72		8,381	15,086
2½ miles south-southeast of; Coalmont S. New Hill mine, Sewanee bed (face of 1 right entry, main entry, 1,063 feet S. 75° W. of mine mouth).	22375	B	1	3.23	30.02	56.94	9.81	.79					2.2	7,283	13,109
			2		31.02	58.84	10.14	.82						7,526	13,547
			3		34.52	65.48		.91						8,375	15,075
2½ miles southeast of; Coalmont S. Old Hill mine, Sewanee bed (face of main entry, 2,380 feet S. 56° W. of mine mouth).	22374	B	1	3.11	28.95	58.83	9.11	.82					1.9	7,390	13,302
			2		29.88	60.72	9.40	.85						7,627	13,729
			3		32.98	67.02		.94						8,419	15,154
2 miles southeast of; Flanagan mine, Sewanee bed (face of main entry, 700 feet east and 300 feet south of mine mouth).	22373	B	1	2.93	30.13	58.06	8.88	.72					1.9	7,359	13,246
			2		31.04	59.81	9.15	.74						7,581	13,646
			3		34.17	65.83		.81						8,344	15,019
11½ miles north 40° east of; Mill Creek prospect pit, Sewanee bed (face of drift, 60 feet east of mouth).	22379	B	1	3.06	31.67	55.06	10.21	2.70					1.8	7,335	13,203
Same (another prospect pit) (face of drift 50 feet south of mouth)	22380	B	1	4.34	28.25	60.08	7.33	.61					3.0	7,458	13,424
Same drift (another prospect pit) (face of entry 100 feet east of mouth).	22381	B	1	3.31	30.10	58.33	8.26	.86					1.7	7,426	13,367
Same (composite of samples 22379, 22380, and 22381)	22382	B	1	3.64	29.80	57.90	8.66	1.37	4.97	75.16	1.49	8.35	2.2	7,404	13,327
			2		30.93	60.08	8.99	1.42	4.74	78.00	1.55	5.30		7,684	13,831
			3		33.99	66.01		1.56	5.21	85.71	1.70	5.82		8,443	15,197
Tracy City, 1¼ miles northeast of; East Fork mine, Sewanee bed (room, 2 right entry, 1 main entry, 1,600 feet S. 16° W. of mine mouth).	22361	B	1	3.12	31.79	55.12	9.97	1.99					1.7	7,327	13,189
1¼ miles north-northeast of; East Staub mine, Sewanee bed (near 1 right entry, Campbell entry, 4,600 feet N. 20° E. of entry mouth).	22363	B	1	3.90	27.46	57.86	10.78	.60					2.4	7,145	12,861
3½ miles west-northwest of; Old Clouse Hill mine, Sewanee bed (room, 200 feet east of pit mouth).	22372	B	1	3.92	30.72	56.68	8.68	.77					2.5	7,249	13,048
			2		31.97	59.00	9.03	.80						7,545	13,581
			3		35.14	64.86		.88						8,294	14,929
2½ miles north-northwest of; Old Ramsey mine (near 11 right entry, old T. C. I. main entry, 2,600 feet N. 45° E. of opening near Old Ramsey tipple).	22404	B	1	3.90	29.48	58.64	7.98	.56					2.1	7,358	13,244
1 mile east of; Old Staub mine, Sewanee bed (face of Jerry Downing entry, old main entry of No. 1 mine, 5,850 feet N. 20° W. of mouth of old No. 1 mine).	22371	B	1	4.10	28.37	58.73	8.80	.55					2.8	7,282	13,108
			2		29.58	61.24	9.18	.57						7,594	13,669
			3		32.57	67.43		.63						8,362	15,052
1¾ miles northeast of; Rattlesnake mine, Sewanee bed (face of crosscut, Old Rattlesnake entry, 2,100 feet N. 10° W. of mine mouth).	22362	B	1	3.48	28.72	58.42	9.38	.63					2.0	7,318	13,172
1½ miles east of; Reed Hill No. 1 mine, Sewanee bed (room, main entry, 2,400 feet south of mine mouth).	22359	B	1	3.42	29.23	58.41	8.94	.64					1.8	7,354	13,237
2 miles east of; Reed Hill No. 2 (Henley) mine, Sewanee bed (face of Sitz entry, near face of old No. 7 in Old Reed Hill mine, 1,300 feet N. 75° W. of pit mouth).	22360	B	1	2.63	31.78	53.93	11.66	3.71					1.4	7,191	12,944
Same (composite of samples 22359, 22360, 22361, 22362, and 22363).	22364	B	1	3.28	29.87	56.58	10.27	1.52	5.00	73.88	1.38	7.95	1.9	7,245	13,141
			2		30.88	58.50	10.62	1.57	4.80	76.38	1.43	5.20		7,491	13,484
			3		34.55	65.45		1.76	5.37	85.45	1.60	5.82		8,381	15,086
2½ miles west of; West Ramsey mine, Sewanee bed (near face of Saunders entry, old N. C. main entry, 1,850 feet S. 60° W. of mine mouth near Old Ramsey tipple).	22403	B	1	4.48	29.14	58.67	7.71	.63					2.7	7,335	13,203
Same (composite of samples 22403 and 22404)	22405	B	1	4.24	29.12	58.88	7.76	.59	5.04	75.26	1.54	9.81	2.4	7,350	13,230
			2		30.41	61.49	8.10	.62	4.77	78.60	1.61	6.30		7,676	13,817
			3		33.09	66.91		.67	5.19	85.52	1.75	6.87		8,352	15,034

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
TENNESSEE—Continued.																
HAMILTON COUNTY.																
Daisy, ¾ mile northwest of; Abel mine (face of 2 room, main entry, 350 feet north-northeast of mine mouth).	.....	22249	B	1	2.57	30.44	58.27	8.72	1.49	.....	.....	.....	.....	1.7	7,685	13,833
				2	.....	31.24	59.81	8.95	1.53	.....	.....	.....	.....	.....	7,888	14,198
				3	.....	34.31	65.69	.....	1.68	.....	.....	.....	.....	.....	8,663	15,593
Montlake, 2½ miles northwest of; Montlake mine, No. 10 bed (face of 3 crosscut entry, 1,400 feet N. 30° E. of mine mouth).	.....	22243	B	1	3.43	28.12	58.60	9.85	2.35	.....	.....	.....	.....	2.5	7,434	13,381
Same (face of 11 cross entry, 2,850 feet N. 32° E. of mine mouth).	.....	22244	B	1	2.48	29.01	54.98	13.53	4.27	.....	.....	.....	.....	1.6	7,128	12,830
Same (face of 11 right cross entry, 2,700 feet N. 20° E. of mine mouth).	.....	22245	B	1	2.64	29.80	57.64	9.92	2.53	.....	.....	.....	.....	1.8	7,477	13,459
Same (composite of samples 22243, 22244, and 22245)	.....	22246	B	1	2.86	29.03	57.08	11.03	3.00	4.88	73.94	1.34	5.81	2.0	7,341	13,214
				2	.....	29.88	58.77	11.35	3.09	4.69	76.11	1.38	3.38	.....	7,557	13,603
				3	.....	33.70	66.30	.....	3.49	5.29	85.85	1.56	3.81	.....	8,524	15,343
2⅜ miles northwest of; Montlake No. 4 mine, unnamed bed (face of 1 right entry, 185 feet N. 4° E. and 415 feet S. 86° E. of mine mouth).	.....	22247	B	1	4.26	25.69	59.21	10.84	1.59	.....	.....	.....	.....	3.1	7,217	12,991
				2	.....	26.83	61.85	11.32	1.66	.....	.....	.....	.....	.....	7,538	13,568
				3	.....	30.25	69.75	.....	1.87	.....	.....	.....	.....	.....	8,500	15,300
Rathburn, 2¼ miles northwest of; Big Soddy mine, Soddy bed (8 room, main entry, 1,200 feet N. 25° E. of mine mouth).	.....	22248	B	1	3.26	27.97	63.77	5.00	1.62	.....	.....	.....	.....	1.9	7,808	14,054
				2	.....	28.91	65.92	5.17	1.67	.....	.....	.....	.....	.....	8,071	14,528
				3	.....	30.49	69.51	.....	1.76	.....	.....	.....	.....	.....	8,511	15,320
¾ mile west of; Furman mine, Soddy bed (face of Jones place, 650 feet N. 15° W. of mine mouth).	.....	22211	B	1	2.96	29.50	61.97	5.57	.72	.....	.....	.....	.....	1.9	7,870	14,166
Same (face of 4 room, 1 right entry, 700 feet N. 10° W. of mine mouth).	.....	22212	B	1	2.66	30.24	60.36	6.74	.66	.....	.....	.....	.....	1.6	7,712	13,882
Same (composite of samples 22211 and 22212)	.....	22213	B	1	2.73	29.83	61.23	6.21	.69	5.26	79.43	1.30	7.11	1.8	7,788	14,018
				2	.....	30.67	62.95	6.38	.71	5.10	81.66	1.34	4.81	.....	8,007	14,413
				3	.....	32.76	67.24	.....	.76	5.45	87.22	1.43	5.14	.....	8,552	15,394
1¼ miles southwest of; Old Bunker mine, Soddy bed (face of 5 room, main entry, 500 feet N. 80° W. of mine mouth).	.....	22190	B	1	3.15	28.25	64.60	4.00	.69	.....	.....	.....	.....	2.0	7,952	14,314
				2	.....	29.17	66.70	4.13	.71	.....	.....	.....	.....	.....	8,210	14,778
				3	.....	30.43	69.57	.....	.74	.....	.....	.....	.....	.....	8,564	15,415
1½ miles southwest of; Sheephead mine, Soddy bed (face of 3 room, new slope, 400 feet N. 10° W. of mine mouth).	.....	22187	B	1	3.47	26.74	60.03	9.76	.81	.....	.....	.....	.....	2.5	7,439	13,390

Same (face of 6 room, back entry, 350 feet S. 40° W. of mine mouth).	.....	22188	B	1	3.38	27.38	58.75	10.49	.99	.....	.....	.....	.....	2.3	7,383	13,289
Same (composite of samples 22187 and 22188)	.....	22189	B	1	3.42	27.08	59.40	10.10	.90	5.10	75.67	1.42	6.81	2.4	7,406	13,331
				2	.....	28.04	61.50	10.46	.93	4.89	78.35	1.47	3.90	.....	7,668	13,802
				3	.....	31.32	68.68	.....	1.04	5.46	87.50	1.64	4.36	.....	8,564	15,415
1½ miles west of; Soddy No. 1 mine, Soddy bed (face of 43 room, 5 right entry, new haulage way, 8,900 feet S. 75° W. of mine mouth).	.....	22160	B	1	2.75	27.76	61.64	7.85	.98	.....	.....	.....	.....	1.9	7,672	13,810
Same (face of 3 room, 11 right entry, new haulage way, 9,300 feet S. 65° W. of mine mouth).	.....	22161	B	1	2.63	29.46	62.49	5.42	1.23	.....	.....	.....	.....	1.7	7,917	14,251
Same (face of 14 right entry, new main entry, 7,000 feet N. 85° W. of mine mouth).	.....	22162	B	1	2.85	29.93	59.22	8.00	1.20	.....	.....	.....	.....	1.9	7,642	13,756
Same (face of 1 room, 17 right entry, main entry, 8,200 feet west of mine mouth).	.....	22163	B	1	2.50	29.61	60.99	6.90	1.54	.....	.....	.....	.....	1.5	7,755	13,959
Same (composite of samples 22160, 22161, 22162, and 22163)	.....	22164	B	1	2.69	29.12	61.12	7.07	1.25	5.22	78.86	1.48	6.12	1.7	7,748	13,946
				2	.....	29.92	62.81	7.27	1.28	5.06	81.04	1.52	3.83	.....	7,962	14,332
				3	.....	32.27	67.73	.....	1.38	5.46	87.39	1.64	4.13	.....	8,586	15,455
MARION COUNTY.																
Orme, 1½ miles north of; Battle Creek No. 3 mine, Battle Creek bed (pillar, Collins entry, 1,550 feet west of mine mouth).	.....	22231	B	1	3.35	34.85	53.32	8.48	1.05	.....	.....	.....	.....	1.5	7,368	13,262
1½ miles north of; Battle Creek No. 4 mine, Battle Creek bed (pillar, 5 right entry, 1,600 feet north and 750 feet east of mine mouth).	.....	22230	B	1	2.85	34.93	48.96	13.26	2.00	.....	.....	.....	.....	1.3	6,993	12,587
Same (pillar, face of 16 left entry, 2,500 feet north and 1,500 feet west of mine mouth).	.....	22233	B	1	2.96	37.34	52.40	7.30	1.76	.....	.....	.....	.....	1.4	7,546	13,583
2¾ miles north-northwest of; Battle Creek No. 5 mine, Battle Creek bed (main entry, 60 feet east of mine mouth).	.....	22232	B	1	3.12	36.92	50.88	9.08	1.42	.....	.....	.....	.....	1.7	7,385	13,293
Same (composite of samples 22230, 22231, 22232, and 22233)	.....	22234	B	1	3.10	35.80	51.62	9.48	1.57	5.38	73.89	1.43	8.25	1.5	7,332	13,198
				2	.....	36.95	53.27	9.78	1.62	5.20	76.25	1.48	5.67	.....	7,567	13,621
				3	.....	40.96	59.04	.....	1.80	5.76	84.52	1.64	6.28	.....	8,387	15,097
Tracy City; 7 miles east of; Long Ridge mine, Sewanee bed (face of main entry, 250 feet S. 45° E. of mine mouth).	.....	22370	B	1	3.82	28.42	59.15	8.51	1.14	.....	.....	.....	.....	2.5	7,321	13,178
				2	.....	29.55	61.50	8.95	1.19	.....	.....	.....	.....	.....	7,612	13,702
				3	.....	32.45	67.55	.....	1.31	.....	.....	.....	.....	.....	8,360	15,048
5½ miles east of; Pryor Ridge No. 1 mine, Sewanee bed (face of 6 room, Thompson entry, left main entry, 1,200 feet N. 10° E. of mine mouth).	.....	22398	B	1	2.86	29.82	56.64	10.68	2.59	.....	.....	.....	.....	1.6	7,270	13,086
Same (face of 4 right entry, 5 right entry, left main entry, 2,700 feet east of mine mouth).	.....	22399	B	1	3.04	29.69	57.47	9.80	1.26	.....	.....	.....	.....	1.8	7,309	13,156
Same (face of 5 right entry, right main entry, 1,800 feet N. 45° W. of mine mouth).	.....	22400	B	1	2.80	30.71	54.65	11.84	4.26	.....	.....	.....	.....	1.7	7,148	12,866
Same (20 stump, 5 left entry, right main entry, 1,900 feet S. 80° W. of mine mouth).	.....	22401	B	1	3.25	29.48	58.31	8.96	.82	.....	.....	.....	.....	1.8	7,381	13,286
Same (composite of samples 22398, 22399, 22400, and 22401)	.....	22402	B	1	3.08	29.60	57.01	10.31	2.22	4.93	73.92	1.41	7.21	1.7	7,286	13,115
				2	.....	30.54	58.82	10.64	2.29	4.74	76.27	1.45	4.61	.....	7,518	13,532
				3	.....	34.18	65.82	.....	2.56	5.30	85.35	1.62	5.17	.....	8,413	15,143
Whiteside, 1 mile southwest of; Bessie prospect, Old Etna bed (rib, main entry, 400 feet south of mine mouth).	.....	22258	B	1	5.16	25.29	67.46	2.09	.63	.....	.....	.....	.....	4.0	8,015	14,427
				2	.....	26.67	71.13	2.20	.66	.....	.....	.....	.....	.....	8,451	15,212
				3	.....	27.27	72.73	.....	.67	.....	.....	.....	.....	.....	8,641	15,554
1 mile west of; Castle Rock mine, Castle Rock bed (face of main entry, 200 feet south of mine mouth).	.....	22254	B	1	4.05	23.81	62.25	9.89	2.31	.....	.....	.....	.....	3.2	7,410	13,338
Same (face of 1 right entry, 175 feet S. 20° W. of mine mouth)	.....	22255	B	1	3.55	23.03	61.77	11.65	2.71	.....	.....	.....	.....	2.7	7,253	13,055

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
TENNESSEE—Continued.																
MARION COUNTY—continued.																
Whiteside, 1 mile west of: Castle Rock mine, Castle Rock bed (composite of samples 22254 and 22255).	.....	22256	B	1	3.78	23.44	62.03	10.75	2.45	4.75	74.80	1.14	6.11	3.0	7,326	13,187
				2	.....	24.36	64.47	11.17	2.55	4.50	77.74	1.18	2.86	.....	7,614	13,705
				3	.....	27.42	72.58	.....	2.87	5.07	87.51	1.33	3.22	.....	8,571	15,428
1 mile southwest of; Clements prospect, Castle Rock bed (rib of main entry, 100 feet southwest of mine mouth).	.....	22257	B	1	2.68	25.07	61.31	10.94	2.87	.....	.....	.....	.....	1.8	7,391	13,304
				2	.....	25.76	63.00	11.24	2.95	.....	.....	.....	.....	.....	7,594	13,669
				3	.....	29.02	70.98	.....	3.32	.....	.....	.....	.....	.....	8,555	15,399
7 miles northwest of; New Etna No. 1 mine, Kelley bed (face of 4 cross entry, 3,000 feet northwest of mine mouth).	.....	22235	B	1	3.15	27.78	59.68	9.39	1.25	.....	.....	.....	.....	2.1	7,516	13,529
Same (face of 7 cross entry, 2,000 feet northeast of mine mouth)	.....	22236	B	1	3.62	27.36	62.05	6.97	1.20	.....	.....	.....	.....	2.7	7,713	13,883
7 miles northwest of; New Etna No. 2 mine, Kelley bed (face of 1 left entry, 1,000 feet southwest of mine mouth).	.....	22237	B	1	3.65	28.04	62.95	5.36	1.31	.....	.....	.....	.....	2.6	7,822	14,080
Same (composite of samples 22235, 22236, and 22237)	.....	22238	B	1	3.52	27.63	61.67	7.18	1.28	5.16	78.09	1.63	6.66	2.4	7,667	13,801
				2	.....	28.64	63.92	7.44	1.33	4.94	80.94	1.69	3.66	.....	7,947	14,305
				3	.....	30.94	69.06	.....	1.44	5.34	87.45	1.83	3.94	.....	8,586	15,455
1⅛ miles west of; Old Etna No. 1 mine, Old Etna bed (face of main entry, 165 feet west of mine mouth).	.....	22251	B	1	4.51	26.32	66.66	2.51	.73	.....	.....	.....	.....	3.6	8,123	14,621
1⅛ miles west of; Old Etna No. 2 mine, Old Etna bed (face of main entry, 200 feet south-southwest of mine mouth).	.....	22252	B	1	5.65	26.67	64.82	2.86	1.06	.....	.....	.....	.....	4.8	7,988	14,378
Same (composite of samples 22251 and 22252)	.....	22253	B	1	5.09	26.60	65.63	2.68	.90	5.35	81.92	1.46	7.69	4.2	8,051	14,492
				2	.....	28.03	69.15	2.82	.95	5.04	86.31	1.54	3.34	.....	8,483	15,269
				3	.....	28.84	71.16	.....	.98	5.19	88.81	1.58	3.44	.....	8,729	15,712
Whitwell, 1 mile southwest of: Whitwell No. 1 mine, Sewanee bed (face of 23 south entry, 5,500 feet S. 21° W. of mine mouth).	.....	22267	B	1	3.29	28.47	59.99	8.25	.58	.....	.....	.....	.....	1.8	7,475	13,455
1¾ miles northwest of; Whitwell No. 5 mine, Sewanee bed (face of 7 north entry, main haulageway, 1,150 feet N. 39° E. of main haulageway, south opening).	.....	22268	B	1	3.32	28.58	59.65	8.45	.75	.....	.....	.....	.....	1.8	7,446	13,403
Same (face of main slope entry, 500 feet N. and 2,750 feet N. 21° E. of main haulageway).	.....	22269	B	1	3.64	28.06	60.00	8.30	1.11	.....	.....	.....	.....	2.2	7,443	13,397

Same (face of 4 north entry, main haulageway, 1,850 feet N. 39° E. of mine mouth).	.....	22270	B	1	3.15	28.89	59.55	8.41	.83	.....	.....	.....	.....	1.7	7,474	13,453
Same (composite of samples 22267, 22268, 22269, and 22270)	.....	22271	B	1	3.38	28.15	60.15	8.32	.79	5.02	76.49	1.49	7.89	1.9	7,462	13,432
				2	.....	29.14	62.25	8.61	.82	4.80	79.17	1.54	5.06	.....	7,723	13,901
				3	.....	31.88	68.12	.....	.90	5.25	86.63	1.69	5.53	.....	8,451	15,212
MORGAN COUNTY.																
Blue Gem siding, 2 miles west-southwest of; Bottomlee mine, Blue Gem bed (face of 1 right entry, 650 feet west of mine mouth).	.....	21150	B	1	2.65	38.85	54.43	4.07	1.62	.....	.....	.....	.....	1.4	7,942	14,296
				2	.....	39.91	55.91	4.18	1.66	.....	.....	.....	.....	.....	8,158	14,684
				3	.....	41.65	58.35	.....	1.73	.....	.....	.....	.....	.....	8,514	15,325
Same: Coal Cut mine, Blue Gem bed (main entry, 250 feet east of mine mouth).	.....	21145	B	1	3.03	39.61	53.14	4.22	1.33	.....	.....	.....	.....	1.5	7,792	14,026
				2	.....	40.85	54.80	4.35	1.37	.....	.....	.....	.....	.....	8,035	14,463
				3	.....	42.71	57.29	.....	1.43	.....	.....	.....	.....	.....	8,401	15,122
Christmas siding, 1½ miles west of; Grassy Ridge mine, Grassy Ridge bed (rib, main entry of new opening, 250 feet north of mine mouth).	.....	21151	B	1	3.01	39.29	54.06	3.64	1.81	.....	.....	.....	.....	1.7	7,953	14,315
				2	.....	40.51	55.74	3.75	1.87	.....	.....	.....	.....	.....	8,200	14,760
				3	.....	42.09	57.91	.....	1.94	.....	.....	.....	.....	.....	8,520	15,336
½ mile west of; Harriman mine, Hooper bed (rib, main slope, 50 feet south of mine mouth)	.....	21152	B	1	3.34	39.53	54.64	2.49	.67	.....	.....	.....	.....	2.0	8,020	14,436
				2	.....	40.90	56.52	2.58	.69	.....	.....	.....	.....	.....	8,297	14,935
				3	.....	41.98	58.02	.....	.71	.....	.....	.....	.....	.....	8,517	15,331
¼ mile south of; Smith mine, Hooper bed (?) (rib, main entry, 100 feet south of mine mouth).	.....	21153	B	1	3.56	36.37	54.73	5.34	.77	.....	.....	.....	.....	2.1	7,730	13,914
				2	.....	37.71	56.75	5.54	.80	.....	.....	.....	.....	.....	8,015	14,427
				3	.....	39.92	60.08	.....	.85	.....	.....	.....	.....	.....	8,485	15,273
Coalfield, 1½ miles northeast of; Bowing mine, Coal Creek bed (6 left entry, 1 entry, 2,400 feet N. 30° W. of mine mouth).	.....	21104	B	1	1.60	38.35	51.43	8.62	5.01	.....	.....	.....	.....	.9	7,660	13,788
Same (main Fisher entry, 600 feet northeast from mine mouth)	.....	21105	B	1	2.44	36.30	54.26	7.00	3.12	.....	.....	.....	.....	1.4	7,691	13,844
Same (composite of samples 21104 and 21105)	.....	21106	B	1	2.00	37.54	52.57	7.89	4.03	5.48	75.00	1.72	5.88	1.1	7,672	13,810
				2	.....	38.31	53.64	8.05	4.11	5.37	76.53	1.76	4.18	.....	7,829	14,092
				3	.....	41.66	58.34	.....	4.47	5.84	83.23	1.91	4.55	.....	8,514	15,325
1½ miles northeast of; Conger (Old Baker) mine, Coal Creek bed (face of 2 right entry, 1,800 feet northeast of mine mouth).	.....	21100	B	1	2.16	38.50	51.65	7.69	4.26	.....	.....	.....	.....	1.4	7,710	13,880
Same (face of 6 right entry, 2,000 feet northeast of mine mouth)	.....	21101	B	1	1.83	39.29	52.10	6.78	3.55	.....	.....	.....	.....	1.0	7,822	14,080
Same (face of 8 right entry, 2,000 feet northeast of mine mouth)	.....	21102	B	1	1.75	38.03	50.32	9.90	4.33	.....	.....	.....	.....	1.0	7,537	13,567
Same (composite of samples 21100, 21101, and 21102)	.....	21103	B	1	1.88	38.46	51.52	8.14	4.04	5.60	75.26	1.79	5.17	1.1	7,693	13,847
				2	.....	39.20	52.50	8.30	4.12	5.49	76.70	1.82	3.57	.....	7,841	14,114
				3	.....	42.75	57.25	.....	4.49	5.99	83.64	1.98	3.90	.....	8,551	15,392
¾ mile west of: Davis mine, Coal Creek (?) bed (1 right entry, 200 feet from main entry).	.....	21147	B	1	3.47	36.60	55.44	4.49	1.42	.....	.....	.....	.....	2.1	7,774	13,993
				2	.....	37.91	57.44	4.65	1.47	.....	.....	.....	.....	.....	8,053	14,495
				3	.....	39.76	60.24	.....	1.54	.....	.....	.....	.....	.....	8,446	15,203
1½ miles northeast of; Slope mine, Coal Creek bed (mouth of 1 east entry, 250 feet northeast of mine mouth).	.....	21099	B	1	3.31	39.05	52.91	4.73	3.29	.....	.....	.....	.....	2.6	7,891	14,204
				2	.....	40.39	54.72	4.89	3.40	.....	.....	.....	.....	.....	8,161	14,690
				3	.....	42.47	57.53	.....	3.57	.....	.....	.....	.....	.....	8,580	15,444
1¼ miles southeast of; Thornton mine, Blue Gem bed (face of 1 left entry, 100 feet north and 50 feet west of mine mouth).	.....	21146	B	1	4.51	37.02	47.37	11.10	4.35	.....	.....	.....	.....	3.2	7,040	12,672
				2	.....	38.77	49.61	11.62	4.56	.....	.....	.....	.....	.....	7,372	13,270
				3	.....	43.87	56.13	.....	5.16	.....	.....	.....	.....	.....	8,341	15,014
Lancing, 8 miles east of; Summers mine (face of main entry, 230 feet S. 30° E. of mine mouth).	.....	21148	B	1	4.33	35.14	55.91	4.62	1.26	.....	.....	.....	.....	3.3	7,775	13,995
				2	.....	36.73	58.44	4.83	1.32	.....	.....	.....	.....	.....	8,127	14,629
				3	.....	38.60	61.40	.....	1.39	.....	.....	.....	.....	.....	8,540	15,372
Nemo, 3½ miles southwest of; Catoosa mine, Walden Ridge bed (face of 2 room, 1 right entry, 75 feet north of mine mouth).	.....	21428	B	1	2.89	32.20	57.64	7.27	1.29	.....	.....	.....	.....	2.2	7,724	13,903
				2	.....	33.16	59.35	7.49	1.33	.....	.....	.....	.....	.....	7,954	14,317
				3	.....	35.85	64.15	.....	1.44	.....	.....	.....	.....	.....	8,598	15,476

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
TENNESSEE—Continued.																
MORGAN COUNTY—continued.																
Oliver Springs, 3¾ miles north-northwest of; Big Mountain mine, Coal Creek bed (rib in main entry, 300 feet north of mine mouth).	.....	21424	B	1	2.05	39.24	52.10	6.61	4.15	.....	.....	.....	.....	1.1	7,766	13,979
				2	.....	40.06	53.19	6.75	4.24	.....	.....	.....	.....	.....	7,928	14,270
				3	.....	42.96	57.04	.....	4.55	.....	.....	.....	.....	.....	8,502	15,304
1¾ miles northwest of; Jackson mine, Coal Creek (?) bed (rib sample from main entry, 400 feet northwest of mine mouth).	.....	21426	B	1	2.42	40.22	54.66	2.70	.99	.....	.....	.....	.....	1.0	7,980	14,364
				2	.....	41.22	56.01	2.77	1.01	.....	.....	.....	.....	.....	8,178	14,720
				3	.....	42.39	57.61	.....	1.04	.....	.....	.....	.....	.....	8,411	15,140
1½ miles west-northwest of; Levan mine, Old Eagle bed (face of butt entry, 250 feet north of mine mouth).	.....	21420	B	1	2.48	39.09	54.95	3.48	1.36	.....	.....	.....	.....	1.0	7,955	14,319
				2	.....	40.08	56.35	3.57	1.39	.....	.....	.....	.....	.....	8,157	14,683
				3	.....	41.56	58.44	.....	1.44	.....	.....	.....	.....	.....	8,459	15,226
2¼ miles north-northwest of; Old Mount Carbon mine, Coal Creek bed (rib in main entry, 75 feet east of mine mouth).	.....	21421	B	1	2.52	39.37	54.90	3.21	1.18	.....	.....	.....	.....	1.1	7,947	14,305
				2	.....	40.39	56.32	3.29	1.21	.....	.....	.....	.....	.....	8,153	14,675
				3	.....	41.76	58.24	.....	1.25	.....	.....	.....	.....	.....	8,430	15,174
4 miles north-northwest of; Poplar Creek mine, Coal Creek bed (rib in main entry, 400 feet north of mine mouth).	.....	21423	B	1	2.00	39.00	51.98	7.02	3.89	.....	.....	.....	.....	1.0	7,697	13,855
				2	.....	39.80	53.04	7.16	3.97	.....	.....	.....	.....	.....	7,854	14,137
				3	.....	42.87	57.13	.....	4.28	.....	.....	.....	.....	.....	8,460	15,228
3½ miles northwest of; Prudential mine, Coal Creek bed (face of 13 left entry, 850 feet north and 2,300 feet northwest of mine mouth).	.....	21412	B	1	1.93	39.14	48.76	10.17	4.48	.....	.....	.....	.....	1.2	7,466	13,439
Same (face of 12 left entry, 850 feet north and 2,000 feet northwest of mine mouth).	.....	21413	B	1	1.38	39.77	49.70	9.15	4.75	.....	.....	.....	.....	.5	7,626	13,727
Same (face of 11 left entry, 850 feet north and 1,800 feet northwest of mine mouth).	.....	21414	B	1	1.57	39.40	50.29	8.74	4.36	.....	.....	.....	.....	.7	7,673	13,811
Same (composite of samples 21412, 21413, and 21414)	.....	21415	B	1	1.51	39.65	49.55	9.29	4.43	5.38	74.19	1.78	4.93	.8	7,600	13,680
				2	.....	40.26	50.31	9.43	4.50	5.29	75.33	1.81	3.64	.....	7,716	13,889
				3	.....	44.45	55.55	.....	4.97	5.84	83.17	2.00	4.02	.....	8,519	15,334
1 mile west-northwest of; Reed mine (face of 2 right entry, 800 feet north and 500 feet east of mine mouth).	.....	21425	B	1	2.28	36.96	56.61	4.15	.70	.....	.....	.....	.....	1.0	7,918	14,252
				2	.....	37.82	57.93	4.25	.72	.....	.....	.....	.....	.....	8,102	14,584
				3	.....	39.50	60.50	.....	.75	.....	.....	.....	.....	.....	8,462	15,232
3 miles northwest of; Richards mine, Coal Creek bed (face of main face entry).	.....	21416	B	1	1.56	39.85	46.42	12.17	6.43	.....	.....	.....	.....	.6	7,276	13,097
Same (face of main entry)	.....	21417	B	1	1.63	40.53	51.06	6.78	4.39	.....	.....	.....	.....	.8	7,768	13,982

Same (composite of samples 21416 and 21417)	21418	B	1	1.49	40.02	48.93	9.56	5.40	5.25	72.83	1.70	5.26	.7	7,523	13,541
			2	.....	40.62	49.68	9.70	5.48	5.16	73.93	1.73	4.00	.....	7,637	13,747
			3	.....	44.98	55.02	.....	6.07	5.71	81.87	1.92	4.43	.....	8,457	15,223
2½ miles north-northwest of; Signal Mountain mine, Coal Creek bed (face of main entry, 250 feet north of mine mouth).	21422	B	1	2.12	39.00	49.99	8.89	5.20	.....	.....	.....	.....	1.0	7,478	13,460
			2	.....	39.85	51.07	9.08	5.31	.....	.....	.....	.....	.....	7,640	13,752
			3	.....	43.83	56.17	.....	5.84	.....	.....	.....	.....	.....	8,403	15,125
1½ miles north-northwest of; Williams mine, Coal Creek bed (main entry, 100 feet west of mine mouth).	21419	B	1	2.73	37.60	54.41	5.26	1.10	.....	.....	.....	.....	1.3	7,746	13,943
			2	.....	38.66	55.93	5.41	1.13	.....	.....	.....	.....	.....	7,964	14,335
			3	.....	40.87	59.13	.....	1.19	.....	.....	.....	.....	.....	8,420	15,156
Petros, 1½ miles north of; Frozen Head mine, Frozen Head bed (rib on main entry, 900 feet north of mine mouth).	21083	B	1	3.04	35.21	55.04	6.71	.89	.....	.....	.....	.....	1.3	7,509	13,516
			2	.....	36.32	56.76	6.92	.92	.....	.....	.....	.....	.....	7,745	13,941
			3	.....	39.02	60.98	.....	.99	.....	.....	.....	.....	.....	8,320	14,976
1 mile east of; Petros No. 5 mine, Jellico bed (face of 2 right entry, 2,000 feet east-southeast of mine mouth).	21088	B	1	2.26	36.68	53.28	7.78	2.61	.....	.....	.....	.....	.9	7,539	13,570
Same (face of 3 left entry, about 2,500 feet north of mine mouth)	21089	B	1	2.31	36.39	54.98	6.32	2.56	.....	.....	.....	.....	1.1	7,686	13,835
Same (face of 4 entry, 2,500 feet north-northeast of mine mouth)	21090	B	1	2.19	36.51	53.83	7.47	2.31	.....	.....	.....	.....	1.1	7,579	13,642
Same (composite of samples 21088, 21089, and 21090)	21091	B	1	2.25	36.43	54.21	7.11	2.51	5.43	75.60	1.92	7.43	1.0	7,600	13,680
			2	.....	37.27	55.46	7.27	2.57	5.30	77.34	1.96	5.56	.....	7,775	13,995
			3	.....	40.19	59.81	.....	2.77	5.72	83.40	2.11	6.00	.....	8,385	15,093
1 mile north of; State No. 3 mine, Jellico bed (face of 15 cross entry, 3,500 feet N. 45° W. of main entry).	21092	B	1	2.04	34.61	50.04	13.31	2.05	.....	.....	.....	.....	.8	7,084	12,751
Same (face of 9 cross entry, 3,800 feet N. 55° W. of main entry)	21093	B	1	2.24	36.35	53.58	7.83	2.32	.....	.....	.....	.....	1.0	7,531	13,556
Same (face of 8 cross entry, 4,500 feet S. 55° E. of main entry)	21094	B	1	2.40	37.00	54.82	5.78	3.60	.....	.....	.....	.....	1.2	7,726	13,907
Same (face of 12 cross entry, 4,400 feet E. 55° E. of main entry)	21095	B	1	2.21	37.24	55.00	5.55	2.69	.....	.....	.....	.....	1.0	7,775	13,995
Same (composite of samples 21092, 21093, 21094, and 21095)	21096	B	1	2.25	36.36	53.29	8.10	2.61	5.36	74.94	1.89	7.10	1.0	7,549	13,588
			2	.....	37.20	54.51	8.29	2.67	5.23	76.66	1.93	5.22	.....	7,723	13,901
			3	.....	40.56	59.44	.....	2.91	5.70	83.59	2.10	5.70	.....	8,421	15,158
Stephens, 5 miles west of; Laymance mine (main entry, 200 feet south of mine mouth).	21149	B	1	3.34	35.71	53.93	7.02	2.71	.....	.....	.....	.....	2.6	7,701	13,862
			2	.....	36.95	55.79	7.26	2.80	.....	.....	.....	.....	.....	7,967	14,341
			3	.....	39.84	60.16	.....	3.02	.....	.....	.....	.....	.....	8,591	15,464
½ mile southwest of; Little Brushy mine, Jellico bed (mouth of 12 room, 1 entry, 2,600 feet S. 43° W. of mine mouth).	21084	B	1	2.78	36.92	54.54	5.76	2.92	.....	.....	.....	.....	1.6	7,741	13,934
Same (face of dip entry, 2,600 feet S. 43° W. of mine mouth)	21085	B	1	2.92	37.46	54.95	4.67	2.63	.....	.....	.....	.....	1.7	7,848	14,126
Same (mouth of 4 room, main entry, new opening, 2,650 feet S. 43° W. of mine mouth), old opening.	21086	B	1	2.80	37.32	55.31	4.57	2.26	.....	.....	.....	.....	1.7	7,851	14,132
Same (composite of samples 21084, 21085, and 21086)	21087	B	1	2.87	37.28	54.75	5.10	2.63	5.61	77.44	1.73	7.49	1.6	7,804	14,047
			2	.....	38.38	56.37	5.25	2.71	5.45	79.72	1.78	5.09	.....	8,034	14,461
			3	.....	40.51	59.49	.....	2.86	5.75	84.14	1.88	5.37	.....	8,479	15,262
OVERTON COUNTY.															
Highland Junction, 2½ miles northwest of; Overton mine, Bon Air No. 2 bed (face of main straight entry, 460 feet southwest of opening).	20978	B	1	3.40	35.94	51.19	9.47	3.15	.....	.....	.....	.....	2.2	7,316	13,169
Same (face of main entry, 1,200 feet N. 20° W. of mine mouth)	20979	B	1	3.22	35.77	51.49	9.52	2.29	.....	.....	.....	.....	2.1	7,326	13,187
Same (in 1 left entry, 500 feet from opening)	20980	B	1	3.56	35.04	49.76	11.64	3.68	.....	.....	.....	.....	2.3	7,052	12,694
Same (composite of samples 20978, 20979, and 20980)	20981	B	1	3.43	35.58	50.64	10.35	3.14	5.31	72.25	1.39	7.56	2.2	7,218	12,992
			2	.....	36.84	52.44	10.72	3.25	5.11	74.81	1.44	4.67	.....	7,474	13,453
			3	.....	41.26	58.74	.....	3.64	5.72	83.79	1.61	5.24	.....	8,372	15,070
Obey City, ½ mile east of; Obey River mine, Bon Air No. 2 bed (face of cross entry, 1 left entry, 500 feet northeast of mine mouth).	20991	B	1	2.64	36.00	49.09	12.27	3.80	.....	.....	.....	.....	1.7	7,147	12,865
			2	.....	36.98	50.42	12.60	3.90	.....	.....	.....	.....	.....	7,341	13,214
			3	.....	42.31	57.69	.....	4.46	.....	.....	.....	.....	.....	8,400	15,120

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
TENNESSEE—Continued.																
OVERTON COUNTY—continued.																
Obey City, ⅛ mile west of; Peacock mine, Bon Air No. 2 bed (face of cross entry, 1 right entry, 1,000 feet southwest of mine mouth).	.....	20992	B	1	2.83	36.42	50.75	10.00	3.30	.....	.....	.....	.....	1.9	7,315	13,165
				2	.....	37.48	52.23	10.29	3.41	.....	.....	.....	.....	.....	7,528	13,550
				3	.....	41.78	58.22	.....	3.80	.....	.....	.....	.....	.....	8,391	15,104
PUTNAM COUNTY.																
Monterey, 2 miles north of; Monterey mine, Bon Air No. 2 bed (face of main entry, 200 feet south of mine mouth).	.....	20990	B	1	3.38	38.23	48.66	9.73	3.43	.....	.....	.....	.....	2.2	7,275	13,095
				2	.....	39.57	50.36	10.07	3.55	.....	.....	.....	.....	.....	7,530	13,554
				3	.....	44.00	56.00	.....	3.95	.....	.....	.....	.....	.....	8,373	15,071
RHEA COUNTY.																
Graysville, 2⅛ miles north of; Montague No. 1 mine, Nelson bed (air-course pillar, 2 haulage way, 1 main entry).	.....	22159	B	1	2.04	33.38	56.95	7.63	3.70	.....	.....	.....	.....	1.1	7,670	13,806
				2	.....	34.07	58.14	7.79	3.77	.....	.....	.....	.....	.....	7,830	14,094
				3	.....	36.95	63.05	.....	4.09	.....	.....	.....	.....	.....	8,492	15,286
Same (chain pillar, main entry)	.....	22165	B	1	2.05	29.40	53.09	15.47	.71	.....	.....	.....	.....	1.2	6,985	12,573
				2	.....	30.01	54.20	15.79	.72	.....	.....	.....	.....	.....	7,131	12,836
				3	.....	35.64	64.36	.....	.86	.....	.....	.....	.....	.....	8,468	15,242
3 miles north of; Montague No. 3 mine, Sewanee bed (face of 8 right entry, 3,200 feet N. 20° E., and 500 feet S. 70° E., of mine mouth).	.....	22180	B	1	2.53	28.79	54.33	14.35	.91	.....	.....	.....	.....	1.3	7,004	12,607
2½ miles north of; Montague No. 5-A mine, Sewanee bed (face of 2 right entry, 600 feet east of mine mouth).	.....	22181	B	1	4.15	29.95	55.11	10.79	.77	.....	.....	.....	.....	2.9	7,203	12,965
Same (face of 2 left entry, 1,200 feet north of mine mouth)	.....	22182	B	1	2.51	31.45	53.79	12.25	2.00	.....	.....	.....	.....	1.2	7,169	12,904
2½ miles north of; Montague No. 5-B mine, Sewanee bed (pillar, 1 right entry, 600 feet south of mine mouth).	.....	22183	B	1	2.48	30.75	56.69	10.08	1.31	.....	.....	.....	.....	1.2	7,402	13,324
Same (composite of samples 22180, 22181, 22182, and 22183).	.....	22184	B	1	2.98	30.16	55.04	11.82	1.25	4.90	72.96	1.40	7.67	1.6	7,201	12,962
				2	.....	31.09	56.73	12.18	1.29	4.71	75.20	1.44	5.18	.....	7,422	13,360
				3	.....	35.40	64.60	.....	1.47	5.36	85.63	1.64	5.90	.....	8,451	15,212
2 miles north of; Montague No. 6 mine, Nelson bed (face of 1 room, main entry, 400 feet west of mine mouth).	.....	22158	B	1	2.85	25.53	46.41	25.21	.57	.....	.....	.....	.....	1.8	5,960	10,728
				2	.....	26.28	47.77	25.95	.59	.....	.....	.....	.....	.....	6,135	11,043
				3	.....	35.49	64.51	.....	.80	.....	.....	.....	.....	.....	8,285	14,913

ROANE COUNTY.																
Harriman, 2 miles northeast of; Walden Ridge mine, Walden Ridge bed (face of 1 room, 1 right entry, 300 feet north of mine mouth).	.....	21082	B	1	4.30	33.13	54.10	8.47	.48	.....	.....	.....	.....	2.7	7,292	13,162
				2	.....	34.62	56.53	8.85	.50	.....	.....	.....	.....	.....	7,619	13,714
				3	.....	37.98	62.02	.....	.55	.....	.....	.....	.....	.....	8,359	15,046
McLean siding, ¾ mile south of; McLean mine Sewanee bed (face of Sam Day's place, 3,000 feet N. 70° W. of mine mouth).	.....	21023	B	1	1.54	28.17	47.24	23.05	2.02	.....	.....	.....	.....	.7	6,348	11,426
				2	.....	28.61	47.98	23.41	2.05	.....	.....	.....	.....	.....	6,447	11,605
				3	.....	37.36	62.64	.....	2.68	.....	.....	.....	.....	.....	8,418	15,152
Same (face of Hartberger's place, 700 feet northwest of mine mouth).	.....	21024	B	1	2.95	29.44	58.09	9.52	.79	.....	.....	.....	.....	1.9	7,404	13,327
				2	.....	30.33	59.86	9.81	.81	.....	.....	.....	.....	.....	7,629	13,732
				3	.....	33.63	66.37	.....	.90	.....	.....	.....	.....	.....	8,459	15,226
Same (composite of samples 21023 and 21024)	.....	21025	B	1	2.25	28.73	52.70	16.32	1.37	4.73	69.80	1.27	6.51	1.3	6,887	12,397
				2	.....	29.39	53.91	16.70	1.40	4.58	71.41	1.30	4.61	.....	7,045	12,681
				3	.....	35.38	64.72	.....	1.68	5.50	85.73	1.56	5.53	.....	8,458	15,224
¾ mile west of; Rockwood mine, Sewanee bed (face of 1 dip entry, 9 entry).	.....	18695	A	1	1.39	30.43	59.10	9.08	.54	.....	.....	.....	.....	.5	7,623	13,721
Same (face of incline, 6 entry)	.....	18696	A	1	1.41	29.21	60.37	9.01	.51	.....	.....	.....	.....	.5	7,625	13,725
Same (face 2 entry)	.....	18697	A	1	1.56	28.78	58.65	11.01	.64	.....	.....	.....	.....	.7	7,461	13,430
Same (composite of samples 18695, 18696, and 18697)	.....	18698	A	1	1.51	29.49	59.32	9.68	.56	4.73	77.44	1.32	6.27	.5	7,565	13,617
				2	.....	29.94	60.23	9.83	.57	4.63	78.62	1.34	5.01	.....	7,681	13,826
				3	.....	33.20	66.80	.....	.63	5.13	87.19	1.49	5.56	.....	8,518	15,332
Same (Bill Mahorn's place, 2 entry, 10,500 feet northwest of mine mouth).	.....	21015	B	1	8.71	22.87	49.39	19.03	.62	.....	.....	.....	.....	8.0	6,097	10,975
				2	.....	25.05	54.10	20.85	.68	.....	.....	.....	.....	.....	6,679	12,022
				3	.....	31.65	68.35	.....	.86	.....	.....	.....	.....	.....	8,438	15,188
Same (Lee McNeil's place, 6 entry, 10,500 feet N. 20° W. of mine mouth).	.....	21016	B	1	1.74	29.25	60.09	8.92	.53	.....	.....	.....	.....	.9	7,632	13,738
				2	.....	29.77	61.15	9.08	.54	.....	.....	.....	.....	.....	7,767	13,981
				3	.....	32.74	67.26	.....	.59	.....	.....	.....	.....	.....	8,543	15,377
Same (John Long's place, 9 entry, 11,500 feet N. 15° E. of mine mouth).	.....	21017	B	1	1.63	29.13	60.01	9.23	.46	.....	.....	.....	.....	.7	7,582	13,648
				2	.....	29.61	61.01	9.38	.47	.....	.....	.....	.....	.....	7,708	13,874
				3	.....	32.67	67.33	.....	.52	.....	.....	.....	.....	.....	8,506	15,311
Same (W. T. Acuff's place, 10 entry, 6,500 feet north of mine mouth).	.....	21018	B	1	2.19	29.54	59.43	8.84	.49	.....	.....	.....	.....	1.2	7,567	13,621
				2	.....	30.20	60.76	9.04	.50	.....	.....	.....	.....	.....	7,737	13,927
				3	.....	33.20	66.80	.....	.55	.....	.....	.....	.....	.....	8,506	15,311
Same (composite of samples 21015, 21016, 21017, and 21018)	.....	21019	B	1	3.61	27.68	56.98	11.73	.51	4.95	73.71	1.24	7.86	2.7	7,202	12,964
				2	.....	28.72	59.11	12.17	.53	4.72	76.47	1.29	4.82	.....	7,472	13,450
				3	.....	32.70	67.30	.....	.60	5.37	87.07	1.47	5.49	.....	8,508	15,314
SCOTT COUNTY.																
Bear Creek Junction, 2 miles north of; Phillips mine, No. 4 bed (face of 17 room, 2 right entry, 600 feet west and 1,100 feet north of mine mouth).	.....	21154	B	1	3.72	37.90	56.92	4.76	1.91	.....	.....	.....	.....	1.8	7,366	13,259
Same (mouth of 6 right entry, 1 main entry, 1,800 feet west of mine mouth).	.....	21155	B	1	3.82	39.34	51.13	5.71	1.99	.....	.....	.....	.....	1.8	7,540	13,572
Same (composite of samples 21154 and 21155)	.....	21156	B	1	3.75	38.50	51.23	6.52	1.93	5.60	74.32	1.83	9.80	1.8	7,446	13,403
				2	.....	40.00	53.23	6.77	2.01	5.38	77.22	1.90	6.72	.....	7,736	13,925
				3	.....	42.90	57.10	.....	2.16	5.77	82.83	2.04	7.20	.....	8,298	14,936
2½ miles west of; Wilson mine, No. 4 bed (face of 7 room, 4 south entry, 200 feet west and 600 feet south of mine mouth).	.....	21219	B	1	3.75	39.52	48.61	8.12	4.27	.....	.....	.....	.....	2.2	7,312	13,162
Same (face of 10 room, 1 north entry, 700 feet north of mine mouth).	.....	21220	B	1	3.57	39.68	44.67	12.08	6.02	.....	.....	.....	.....	2.2	6,969	12,544
Same (composite of samples 21219 and 21220)	.....	21221	B	1	3.61	39.63	46.64	10.12	5.13	5.42	70.08	1.63	7.62	2.2	7,161	12,872
				2	.....	41.12	48.38	10.50	5.32	5.21	72.71	1.69	4.57	.....	7,419	13,354
				3	.....	45.94	54.06	.....	5.94	5.82	81.24	1.89	5.11	.....	8,289	14,920

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
TENNESSEE—Continued.																
SCOTT COUNTY—continued.																
Bear Creek Junction, 2½ and 2 miles west of; Wilson and Phillips mines, No. 4 bed (sample was taken from a railroad car of washed slack).	.....	21218	C	1	9.00	36.48	42.69	11.83	4.52	5.59	63.48	1.55	13.03	7.5	6,532	11,758
				2	.....	40.09	46.91	13.00	4.97	5.04	69.76	1.70	5.53	.....	7,178	12,920
				3	.....	46.08	53.92	.....	5.71	5.79	80.18	1.95	6.37	.....	8,250	14,850
Huntsville, 1½ miles northeast of; Cross (wagon) mine (face of main entry, 100 feet northwest of mine mouth).	.....	21222	B	1	4.56	38.00	48.80	8.64	3.61	.....	.....	.....	.....	3.4	7,295	13,131
				2	.....	39.82	51.13	9.05	3.78	.....	.....	.....	.....	.....	7,644	13,759
				3	.....	43.78	56.22	.....	4.16	.....	.....	.....	.....	.....	8,405	15,129
Jakes Tank, ¼ mile west of; Jakes Branch mine (rib sample, 300 feet from mouth of 2 right entry).	.....	21226	B	1	3.90	36.68	54.78	4.64	.79	.....	.....	.....	.....	2.3	7,718	13,892
				2	.....	38.17	57.00	4.83	.82	.....	.....	.....	.....	.....	8,031	14,456
				3	.....	40.11	59.89	.....	.86	.....	.....	.....	.....	.....	8,439	15,190
½ mile south of; Opossum Jaw mine (face of 2 right room, main entry, 100 feet south-southwest of mine mouth).	.....	21223	B	1	3.61	39.30	49.06	8.03	3.34	.....	.....	.....	.....	2.4	7,466	13,439
				2	.....	40.77	50.90	8.33	3.47	.....	.....	.....	.....	.....	7,746	13,913
				3	.....	44.48	55.52	.....	3.79	.....	.....	.....	.....	.....	8,450	15,210
Newland; Arch Mountain mine, Jellico bed (face of 2 left entry, 300 feet southwest, 270 feet northwest, and 140 feet southwest of mine mouth).	.....	21272	B	1	2.90	36.13	55.56	5.41	1.87	5.60	77.09	2.00	8.03	1.8	7,689	13,840
				2	.....	37.21	57.22	5.57	1.93	5.44	79.39	2.06	5.61	.....	7,919	14,254
				3	.....	39.41	60.59	.....	2.04	5.76	84.07	2.18	5.95	.....	8,386	15,095
Robbins, 1 mile south of; Clay No. 1 mine (face of main entry, 1,000 feet south of mine mouth).	.....	21228	B	1	2.66	39.74	48.36	9.24	3.75	.....	.....	.....	.....	1.2	7,404	13,327
				2	.....	40.82	49.69	9.49	3.85	.....	.....	.....	.....	.....	7,606	13,691
				3	.....	45.10	54.90	.....	4.25	.....	.....	.....	.....	.....	8,404	15,127
½ mile south of; Hughett mine, Blue Gem (?) bed (face of main entry, 300 feet east of mine mouth).	.....	21229	B	1	3.10	38.19	54.63	4.08	1.05	.....	.....	.....	.....	1.2	7,830	14,094
				2	.....	39.41	56.38	4.21	1.08	.....	.....	.....	.....	.....	8,081	14,546
				3	.....	41.14	58.86	.....	1.13	.....	.....	.....	.....	.....	8,437	15,187
8 miles southeast of; Hughett mine, Mud Slip bed (face of main entry, 25 feet west of mine mouth).	.....	21314	B	1	3.78	36.22	55.95	4.05	.89	.....	.....	.....	.....	2.4	7,845	14,121
				2	.....	37.64	58.15	4.21	.92	.....	.....	.....	.....	.....	8,153	14,675
				3	.....	39.30	60.70	.....	.96	.....	.....	.....	.....	.....	8,512	15,322
6 miles southeast of; Long prospect (face of main entry, 20 feet north of mine mouth).	.....	21316	B	1	4.30	36.39	55.23	4.08	1.20	.....	.....	.....	.....	2.8	7,703	13,865
				2	.....	38.02	57.72	4.26	1.25	.....	.....	.....	.....	.....	8,049	14,488
				3	.....	39.71	60.29	.....	1.31	.....	.....	.....	.....	.....	8,407	15,133
6 miles south-southeast of; Newman prospect (face of main entry, 200 feet south of mine mouth).	.....	21315	B	1	3.63	35.33	55.54	5.50	1.04	.....	.....	.....	.....	2.3	7,711	13,880
				2	.....	36.66	57.63	5.71	1.08	.....	.....	.....	.....	.....	8,002	14,404
				3	.....	38.88	61.12	.....	1.15	.....	.....	.....	.....	.....	8,487	15,277

Stanley Junction, 1,000 feet northwest of; Keaton Brothers mine, Paint Rock bed (main entry, 200 feet south-southwest of opening).	.....	21227	B	1	4.10	37.03	54.62	4.25	.77	.....	.....	.....	.....	2.4	7,711	13,880
				2	.....	38.61	56.96	4.43	.80	.....	.....	.....	.....	.....	8,041	14,474
				3	.....	40.40	59.60	.....	.84	.....	.....	.....	.....	.....	8,414	15,145
¼ mile southwest of; Pumpkin Hollow mine, Paint Rock bed (main entry, 250 feet west of mine mouth).	.....	21225	B	1	3.61	37.12	54.37	4.90	.81	.....	.....	.....	.....	1.9	7,702	13,864
				2	.....	38.51	56.41	5.08	.84	.....	.....	.....	.....	.....	7,991	14,384
				3	.....	40.57	59.43	.....	.88	.....	.....	.....	.....	.....	8,419	15,154
1,000 feet east of; Sexton mine, Paint Rock bed (face of main entry, 200 feet northeast of mine mouth).	.....	21224	B	1	4.24	36.53	54.94	4.29	.71	.....	.....	.....	.....	2.7	7,680	13,824
				2	.....	38.15	57.37	4.48	.74	.....	.....	.....	.....	.....	8,020	14,436
				3	.....	39.94	60.06	.....	.77	.....	.....	.....	.....	.....	8,396	15,113
SEQUATCHIE COUNTY.																
Dunlap, 2 miles west of; Douglas No. 2 mine, Sewanee bed (face of 9 north entry, 22 west entry, 4,500 feet N. 9° 34′ W. 2,350 feet S. 19° 21′ W., and 1,600 feet N. 39° 34′ W. of mine mouth).	.....	22239	B	1	2.62	29.75	58.97	8.66	1.12	.....	.....	.....	.....	1.4	7,522	13,540
Same (face of 6 north entry, 22 west entry, 4,500 feet N. 9° 34′ W., 1,675 feet S. 19° 21′ W., and 1,800 feet N. 9° 34′ W. of mine mouth).	.....	22240	B	1	2.85	30.11	57.16	9.88	1.22	.....	.....	.....	.....	1.7	7,444	13,399
Same (face of 32 room, 10 north entry, 22 west entry, 4,500 feet N. 9° 34′ W., 2,400 feet S. 19° 21′ W., and 1,300 feet N. 9° 34′ W. of mine mouth).	.....	22241	B	1	2.71	29.40	56.89	11.00	1.60	.....	.....	.....	.....	1.5	7,318	13,172
Same (composite of samples 22239, 22240, and 22241).....	.....	22242	B	1	2.78	29.56	57.87	9.79	1.27	4.96	75.53	1.44.	7.01	1.5	7,425	13,365
				2	.....	30.41	59.52	10.07	1.31	4.78	77.69	1.48	4.67	.....	7,637	13,747
				3	.....	33.82	66.18	.....	1.46	5.32	86.39	1.65	5.18	.....	8,492	15,286
WHITE COUNTY.																
Bon Air, 1¾ miles south of; Bon Air mine, Bon Air (lower) bed (face of main airway, 2,020 feet S. 41° E. of shaft).	.....	22365	B	1	3.00	38.12	51.06	7.82	2.67	.....	.....	.....	.....	1.6	7,489	13,480
Same (face of 2 east entry, 200 feet S. 41° E., and 900 feet southwest of shaft).	.....	22366	B	1	3.49	37.72	51.93	6.86	2.60	.....	.....	.....	.....	2.0	7,510	13,518
Same (face of main west entry, 1,030 feet N. 41° W., and 400 feet N. 13° W. of shaft).	.....	22367	B	1	2.94	38.30	50.55	8.21	3.04	.....	.....	.....	.....	1.5	7,418	13,352
Same (composite of samples 22365, 22366, and 22367).....	.....	22368	B	1	3.15	38.31	50.94	7.60	2.80	5.45	74.45	1.19	8.51	1.7	7,454	13,417
				2	.....	39.56	52.59	7.85	2.89	5.27	76.87	1.23	5.89	.....	7,696	13,853
				3	.....	42.93	57.07	.....	3.14	5.72	83.42	1.33	6.39	.....	8,352	15,034
Same (rib, 3 east entry, 200 feet from main entry, or 592 feet S. 41° E., and 185 feet N. 49° E. of shaft).	.....	22369	B	1	2.73	39.81	47.45	10.01	3.36	.....	.....	.....	.....	1.4	7,354	13,237
				2	.....	40.93	48.78	10.29	3.45	.....	.....	.....	.....	.....	7,561	13,610
				3	.....	45.62	54.38	.....	3.85	.....	.....	.....	.....	.....	8,428	15,170
Clifty, ¼ mile east of; Clifty No. 1 mine, Sewanee (?) bed (face of 1 west entry, 3,450 feet N. 5° W., 3,225 feet N. 86° W., and 3,150 feet west of mine mouth).	.....	22388	B	1	3.97	35.80	48.53	11.70	3.90	.....	.....	.....	.....	2.8	7,087	12,757
Same (face of 8 west entry, 3,450 feet N. 5° W., 3,225 feet N. 86° W., 1,750 feet north, and 1,950 feet west of mine mouth).	.....	22389	B	1	2.46	37.68	49.19	10.67	3.50	.....	.....	.....	.....	1.1	7,339	13,210
Same (face of 3 main air course, 3,450 feet N. 5° W., 3,225 feet N. 86° W., 2,150 feet west, and 1,050 feet north of mine mouth).	.....	22390	B	1	5.57	35.37	47.56	11.50	4.41	.....	.....	.....	.....	4.4	6,965	12,537
Same (face of 3 west entry, 3,450 feet N. 5° W., 3,225 feet N. 86° W., 2,150 feet west, 425 feet north, and 280 feet west of mine mouth).	.....	22391	B	1	3.39	36.12	46.94	13.55	4.82	.....	.....	.....	.....	2.1	6,977	12,559
Same (composite of samples 22388, 22389, 22390, and 22391).....	.....	22392	B	1	3.83	36.15	48.09	11.93	4.22	5.22	69.72	1.33	7.58	2.6	7,088	12,758
				2	.....	37.59	50.01	12.40	4.39	4.98	72.49	1.38	4.36	.....	7,370	13,266
				3	.....	42.91	57.09	.....	5.01	5.69	82.75	1.58	4.97	.....	8,414	15,145

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
TENNESSEE—Continued.																
WHITE COUNTY—continued.																
Ravenscroft, ⅝ mile northeast of; Ravenscroft mine (face of cross entry, Will Marr entry, 1,500 feet northeast of shaft).	.....	22393	B	1	3.37	39.57	46.78	10.28	4.09	.....	.....	.....	.....	1.8	7,224	13,003
Same (face of room, Kelley entry, 2,000 feet north of shaft)	.....	22394	B	1	2.76	40.45	46.57	10.22	3.28	.....	.....	.....	.....	1.3	7,309	13,157
Same (face of Campbell entry, 2,700 feet east of shaft)	.....	22395	B	1	2.78	39.55	46.44	11.23	5.06	.....	.....	.....	.....	1.3	7,204	12,967
Same (room in new west workings, 1,700 feet west of shaft)	.....	22396	B	1	3.39	38.77	47.77	10.07	3.84	.....	.....	.....	.....	1.8	7,230	13,014
Same (composite of samples 22393, 22394, 22395, and 22396)	.....	22397	B	1	3.02	39.65	46.93	10 40	4.12	5.29	71.00	1.41	7.78	1.6	7,252	13,054
				2	.....	40.88	48.40	10.72	4.25	5.10	73.21	1.45	5.27	.....	7,478	13,460
				3	.....	45.79	54.21	.....	4.76	5.71	82.00	1.62	5.91	.....	8,376	15,077
UTAH.																
CARBON COUNTY.																
Carbon, 1¼ miles north of; SE. ¼ SE. ¼ sec. 1, T. 13 S., R. 9 E.; Panther mine, Castlegate bed (face of 2 east entry, main slope, 1,000 feet N. 45° E., and 500 feet east of mine opening).	.....	19881	B	1	3.56	45.62	45.44	5.38	.58	6.06	74.33	1.42	12.23	1.3	7,412	13,342
				2	.....	47.30	47.11	5.59	.60	5.87	77.07	1.47	9.40	.....	7,685	13,833
				3	.....	50.10	49.90	.....	.64	6.22	81.63	1.56	9.95	.....	8,140	14,652
Castlegate, 1½ miles northwest of; NE. ¼ sec. 35, T. 12 S., R. 9 E.; Cameron No. 1 mine, No. 1 bed (2 left entry, main entry, 800 feet S. and 50 feet W. of opening).	.....	19880	B	1	3.30	42.52	47.99	6.19	.40	5.60	73.22	1.35	13.24	1.0	7,258	13,064
				2	.....	43.97	49.63	6.40	.41	5.41	75.72	1.40	10.66	.....	7,505	13,509
				3	.....	46.98	53.02	.....	.44	5.78	80.90	1.50	11.38	.....	8,018	14,432
1 mile northwest of; NE. ¼ sec. 35, T. 12 S., R. 9 E.; Cameron No. 2 mine, No. 2 bed (face of main rise entry, 900 feet S. 85° W. of opening).	.....	19879	B	1	3.05	43.45	46.93	6.57	.47	5.67	73.25	1.41	12.63	.9	7,290	13,122
				2	.....	44.82	48.40	6.78	.48	5.50	75.56	1.45	10.23	.....	7,520	13,536
				3	.....	48.08	51.92	.....	.51	5.90	81.05	1.56	10.98	.....	8,067	14,521
NW. ¼ sec. 1, T. 13 S., R. 9 E.; Castlegate No. 1 mine, D bed (1 right entry, 1 dip entry, 5,400 feet S. 66° W., and 1,400 feet N. N. 45° W. of opening).	.....	19844	B	1	3.81	44.68	44.42	7.09	.61	5.88	71.86	1.39	13.17	1.3	7,196	12,953
				2	.....	46.45	46.18	7.37	.63	5.68	74.71	1.45	10.16	.....	7,481	13,465
				3	.....	50.15	49.85	.....	.68	6.13	80.65	1.57	10.97	.....	8,076	14,537
Same, bed C (18 room, 4 right entry, 1 rise entry, 5,400 feet S. 66° W., and 1,900 feet S. 45° W. of opening).	.....	19846	B	1	4.98	41.81	48.44	4.77	.47	5.76	73.10	1.38	14.52	2.2	7,257	13,063
				2	.....	44.00	50.98	5.02	.49	5.48	76.93	1.45	10.63	.....	7,637	13,747
				3	.....	46.33	53.67	.....	.52	5.77	81.00	1.53	11.18	.....	8,041	14,474
Same, A bed (entry stump, 12 level, 10 rise entry, 4,000 feet S. 66° W., and 4,650 feet S. 4° W., and 200 feet S. 80° E. of opening).	.....	19847	B	1	4.57	42.32	46.95	6.16	.49	5.72	71.80	1.37	14.46	1.9	7,151	12,872
				2	.....	44.35	49.19	6.46	.51	5.46	75.24	1.44	10.89	.....	7,494	13,489
				3	.....	47.41	52.59	.....	.55	5.84	80.44	1.54	11.63	.....	8,012	14,422

¾ mile northeast of; NW. ¼ sec. 6, T. 13 S., R. 10 E., Castlegate No. 2 mine, D bed (1 left main entry, 1 rise entry, 3,200 feet south of mine mouth).	.....	19843	B	1	3.70	42.80	48.19	5.31	.33	5.78	73.94	1.26	13.38	1.3	7,325	13,185
				2	.....	44.44	50.05	5.51	.34	5.58	76.78	1.31	10.48	.....	7,606	13,691
				3	.....	47.03	52.97	.....	.36	5.91	81.26	1.39	11.08	.....	8,049	14,488
Same; B bed (face of 4 right entry, 1 rise entry, 1,700 feet S. 30° E. of mine mouth).	.....	19845	B	1	4.77	40.28	45.96	8.99	.65	5.61	69.62	1.35	13.78	2.6	6,944	12,499
				2	.....	42.30	48.26	9.44	.68	5.33	73.11	1.42	10.02	.....	7,292	13,126
				3	.....	46.70	53.30	.....	.75	5.89	80.73	1.57	11.06	.....	8,052	14,494
Helper, 3 miles northwest of; SW. ¼ NE. ¼ sec. 10, T. 13 S., R. 9 E.; prospect, Spring Canyon No. 1 bed (face of main entry, 350 feet S. 35° W. of opening).	.....	19837	B	1	4.58	43.27	44.66	7.49	.76	.....	.....	.....	.....	2.2	7,063	12,713
				2	.....	45.35	46.80	7.85	.80	.....	.....	.....	.....	.....	7,402	13,324
				3	.....	49.21	50.79	.....	.87	.....	.....	.....	.....	.....	8,033	14,459
3 miles northwest of; SW. ¼ NE. ¼ sec. 10, T. 13 S., R. 9 E.; prospect, Spring Canyon No. 1 bed (face of main entry, 400 feet S. 70° W. of opening).	.....	19838	B	1	4.08	41.33	45.87	8.72	.69	.....	.....	.....	.....	1.8	6,988	12,578
				2	.....	43.09	47.82	9.09	.72	.....	.....	.....	.....	.....	7,285	13,113
				3	.....	47.40	52.60	.....	.79	.....	.....	.....	.....	.....	8,014	14,425
Kenilworth, 1½ miles northeast of; SW. ¼ sec. 10, T. 13 S., R. 10 E.; Aberdeen prospect, Aberdeen bed (460 feet west of mine mouth).	.....	19702	B	1	4.66	41.35	47.62	6.37	.41	.....	.....	.....	.....	.7	7,015	12,627
				2	.....	43.37	49.95	6.68	.43	.....	.....	.....	.....	.....	7,358	13,244
				3	.....	46.48	53.52	.....	.46	.....	.....	.....	.....	.....	7,885	14,193
¾ mile north of; NW. ¼ sec. 16, T. 13 S., R. 10 E.; Kenilworth mine, Aberdeen bed (face of 10 right entry, 4,750 feet from mine mouth).	.....	19680	B	1	6.16	40.81	48.48	4.55	.37	5.57	71.47	1.37	16.67	3.2	7,041	12,674
				2	.....	43.49	51.66	4.85	.39	5.21	76.16	1.46	11.93	.....	7,503	13,505
				3	.....	45.71	54.29	.....	.41	5.48	80.04	1.53	12.54	.....	7,886	14,195
Same; Kenilworth bed (face of main slope, 2,930 feet from mine mouth).	.....	19681	B	1	5.01	43.68	46.51	4.80	.41	5.83	71.93	1.31	15.72	2.0	7,123	12,821
				2	.....	45.98	48.97	5.05	.43	5.55	75.72	1.38	11.87	.....	7,498	13,496
				3	.....	48.42	51.58	.....	.45	5.85	79.75	1.45	12.50	.....	7,897	14,215
Same; Royal Blue bed (face of 1 right entry, up new tunnel, 2,400 feet from mine mouth).	.....	19682	B	1	4.42	44.10	46.54	4.94	.68	5.64	72.34	1.29	15.11	1.5	7,125	12,825
				2	.....	46.14	48.69	5.17	.71	5.39	75.68	1.35	11.70	.....	7,454	13,417
				3	.....	48.65	51.35	.....	.75	5.68	79.80	1.42	12.35	.....	7,860	14,148
Same (face of 3 room, 2 west entry, 850 feet from mine mouth).	.....	19710	B	1	4.03	41.06	50.48	4.43	.65	.....	.....	.....	.....	1.8	7,252	13,054
				2	.....	42.78	52.60	4.62	.68	.....	.....	.....	.....	.....	7,557	13,603
				3	.....	44.85	55.15	.....	.71	.....	.....	.....	.....	.....	7,923	14,261
Same; Aberdeen bed (7 room, 9 left entry, 4,030 feet from mine mouth).	.....	19711	B	1	5.99	38.84	49.11	6.06	.49	.....	.....	.....	.....	2.2	6,908	12,434
				2	.....	41.31	52.24	6.45	.52	.....	.....	.....	.....	.....	7,348	13,226
				3	.....	44.16	55.84	.....	.56	.....	.....	.....	.....	.....	7,854	14,137
Same; Kenilworth bed (face of 1 left back entry, 2,800 feet from mine mouth).	.....	19712	B	1	5.05	41.85	47.41	5.69	.55	.....	.....	.....	.....	.9	7,078	12,740
				2	.....	44.08	49.93	5.99	.58	.....	.....	.....	.....	.....	7,455	13,419
				3	.....	46.89	53.11	.....	.62	.....	.....	.....	.....	.....	7,930	14,274
2¼ miles northeast of; SW. ¼ sec. 11, T. 13 S., R. 10 E., Milburn prospect, Kenilworth bed (100 feet N. 55° W. and 90 feet N. of mine mouth).	.....	19706	B	1	4.02	45.68	44.68	5.62	.54	.....	.....	.....	.....	.7	7,175	12,915
				2	.....	47.59	46.55	5.86	.56	.....	.....	.....	.....	.....	7,476	13,457
				3	.....	50.55	49.45	.....	.59	.....	.....	.....	.....	.....	7,941	14,294
Standardville; SW. ¼ NE. ¼ sec. 8, T. 13 S., R. 9 E.; Standard mine, Castlegate bed (in crosscut, 200 feet S. 50° E. of face of fanway, and 1,450 feet N. 50° W. of opening).	.....	19988	B	1	3.77	45.76	44.47	6.00	.36	5.88	73.12	1.35	13.29	1.6	7,261	13,070
				2	.....	47.55	46.21	6.24	.37	5.67	75.99	1.40	10.33	.....	7,546	13,583
				3	.....	50.72	49.28	.....	.39	6.05	81.05	1.49	11.02	.....	8,049	14,488
Same (150 feet from face of main fanway and 1,550 feet N. 50° W. of opening).	.....	19989	B	1	4.90	42.85	46 18	6.07	.41	5.80	71.80	1.37	14.55	2.8	7,138	12,848
				2	.....	45.06	48.56	6.38	.43	5.53	75.50	1.44	10.72	.....	7,506	13,511
				3	.....	48.13	51.87	.....	.46	5.91	80.64	1.54	11.45	.....	8,017	14,431
Storrs, near; NE. ¼ SW. ¼ sec. 9, T. 13 S., R. 9 E.; Spring Canyon No. 1 mine, Spring Canyon No. 1 bed (face of 4 right entry, main entry, 1,720 feet N. 32° W. of mine mouth).	.....	19986	B	1	4.44	42.87	44.26	8.43	.55	5.78	70.43	1.42	13.39	2.4	7,050	12,690
				2	.....	44.86	46.32	8.82	.58	5.54	73.70	1.49	9.87	.....	7,378	13,280
				3	.....	49.20	50.80	.....	.64	6.08	80.83	1.63	10.82	.....	8,091	14,564
NW. ¼ sec. 9, T. 13 S., R. 9 E.; Spring Canyon No. 2 mine, Spring Canyon No. 2 bed (face of main entry, 810 feet east of opening).	.....	19987	B	1	6.01	42.92	46.14	4.93	.85	6.03	71.79	1.52	14.88	3.9	7,191	12,944
				2	.....	45.66	49.09	5.25	.90	5.70	76.38	1.62	10.15	.....	7,651	13,772
				3	.....	48.19	51.81	.....	.95	6.02	80.61	1.71	10.71	.....	8,075	14,535
At; NW. ¼ sec. 9, T. 13 S., R. 9 E.; Spring Canyon No. 3 mine, Spring Canyon No. 3 bed (face of main entry).		19990	B	1	4.89	42.21	44.75	8.15	.39	5.71	70.19	1.36	14.20	2.8	6,962	12,532
				2	.....	44.38	47.05	8.57	.41	5.44	73.80	1.43	10.35	.....	7,320	13,176
				3	.....	48.54	51.46	.....	.45	5.95	80.72	1.56	11.32	.....	8,006	14,411

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
UTAH—Continued.																
CARBON COUNTY—continued.																
Sunnyside, 1 mile southeast of; SW. ¼ SW. ¼ sec. 4, T. 15 S., R. 14 E.; No. 3 mine, Lower bed (face of 2 left entry, in dips, about 150 feet inside 1 room, about 1 mile northeast of mine opening).	.....	*17604	B	1	4.06	37.99	49.89	8.06	1.15	5.66	71.91	1.47	11.75	1.1	7,131	12,836
				2	.....	39.60	52.00	8.40	1.20	5.43	74.95	1.53	8.49	.....	7,433	13,379
				3	.....	43.23	56.77	.....	1.31	5.93	81.82	1.67	9.27	.....	8,115	14,607
Same; Upper bed (face of 5 room, 2 right entry, about 1 mile south of mine opening).	.....	*17605	B	1	4.41	38.15	50.50	6.94	.82	.....	.....	.....	.....	1.2	7,091	12,764
				2	.....	39.91	52.83	7.26	.86	.....	.....	.....	.....	.....	7,418	13,352
				3	.....	43.03	56.97	.....	.93	.....	.....	.....	.....	.....	7,999	14,398
EMERY COUNTY.																
Black Hawk, ¾ mile from; sec. 4, T. 16 S., R. 8 E.; Black Hawk mine, Hiawatha bed (face of 3 west main entry).	.....	22350	A	1	7.54	43.03	43.40	6.03	.63	.....	.....	.....	.....	4.4	6,935	12,483
Same (face of Carbon entry)	.....	22351	A	1	7.48	41.90	45.07	5.55	.60	.....	.....	.....	.....	4.1	6,978	12,560
Same (face of 13 room, 1 east main entry)	.....	22352	A	1	6.45	42.14	43.96	7.45	.95	.....	.....	.....	.....	2.2	6,893	12,407
Same (16 room, 1 east entry, back entry)	.....	22353	A	1	7.09	42.12	45.73	5.06	.70	.....	.....	.....	.....	3.4	6,991	12,584
Same (face of 3 east entry)	.....	22354	A	1	6.63	43.39	44.30	5.68	.76	.....	.....	.....	.....	3.0	7,043	12,677
Same (face of main entry in "Mexico" entry)	.....	22355	A	1	7.41	40.96	46.87	4.76	.72	.....	.....	.....	.....	3.7	6,987	12,577
Same (face of 2 west entry)	.....	22356	A	1	7.46	43.04	43.80	5.70	.63	.....	.....	.....	.....	4.0	6,956	12,521
Same (composite of samples 22350, 22351, 22352, 22353, 22354, 22355, and 22356).	.....	22357	A	1	7.18	42.16	44.81	5.85	.68	5.71	69.85	1.43	16.48	3.5	6,965	12,537
				2	.....	45.42	48.28	6.30	.73	5.29	75.26	1.54	10.88	.....	7,504	13,507
				3	.....	48.47	51.53	.....	.78	5.65	80.32	1.64	11.61	.....	8,008	14,414
Same (4 pillar, Carbon entry)	.....	22414	A	1	7.61	41.73	44.21	6.45	.71	.....	.....	.....	.....	3.5	6,839	12,310
				2	.....	45.17	47.85	6.98	.77	.....	.....	.....	.....	.....	7,403	13,325
				3	.....	48.56	51.44	.....	.83	.....	.....	.....	.....	.....	7,958	14,324
GRAND COUNTY.																
Thompson, 5 miles north of; NW. ¼ sec. 27, T. 20 S., R. 20 E.; No. 1-A mine, "B" or middle bed of Bear coal (face of main entry 1,200 feet east of opening).	.....	17577	B	1	7.13	37.03	45.40	10.44	.66	5.59	65.98	1.45	15.88	2.0	6,509	11,716
				2	.....	39.87	48.89	11.24	.71	5.17	71.05	1.56	10.27	.....	7,009	12,616
				3	.....	44.92	55.08	.....	.80	5.82	80.04	1.76	11.58	.....	7,896	14,213
Same; SE. ¼ NW. ¼ sec. 27, T. 20 S., R. 20 E.; prospect, "A" or lowest bed of Bear coal (85 feet east of opening).	.....	17578	B	1	6.40	37.79	45.25	10.56	.61	.....	.....	.....	.....	1.3	6,589	11,860
				2	.....	40.37	48.35	11.28	.65	.....	.....	.....	.....	.....	7,040	12,672
				3	.....	45.50	54.50	.....	.73	.....	.....	.....	.....	.....	7,935	14,283

MORGAN COUNTY.																
Devils Slide, 12 miles northeast of; sec. 28, T. 5 N., R. 5 E.; Heber Robinson mine (main entry, 300 feet northeast of opening).	.....	*19799	B	1	18.06	27.39	35.32	19.23	.63	5.28	47.47	.81	26.58	8.7	4,542	8,176
				2	.....	33.43	43.10	23.47	.77	3.99	57.93	.99	12.85	.....	5,543	9,977
				3	.....	43.68	56.32	.....	1.01	5.21	75.70	1.29	16.79	.....	7,243	13,037
12½ miles northeast of; sec. 17, T. 5 N., R. 5 E.; Lucas & Smith mine (rib, 200 feet west of opening).	.....	*19800	B	1	17.55	27.78	36.87	17.80	.46	.....	.....	.....	.....	6.4	4,757	8,563
				2	.....	33.69	44.72	21.59	.56	.....	.....	.....	.....	.....	5,770	10,386
				3	.....	42.97	57.03	.....	.71	.....	.....	.....	.....	.....	7,359	13,246
SANPETE COUNTY.																
Wales, 5 miles southwest of; NE. ¼ sec. 14, T. 16 S., R. 2 E.; Coal Creek (John Reese) mine (300 feet N. 24° E. of opening.	.....	17715	B	1	3.65	29.16	44.68	22.51	6.79	.....	.....	.....	.....	.1	5,717	10,291
				2	.....	30.27	46.37	23.36	7.05	.....	.....	.....	.....	.....	5,934	10,681
				3	.....	39.50	60.50	.....	9.20	.....	.....	.....	.....	.....	7,743	13,937
3½ miles southwest of; NE. ¼ SE. ¼ sec. 2, T. 16 S., R. 2 E.; North Tunnel mine (300 feet N. 5° E. of mine mouth).	.....	17717	B	1	2.41	32.41	45.99	19.19	3.71	.....	.....	.....	.....	.2	6,223	11,201
				2	.....	33.21	47.13	19.66	3.80	.....	.....	.....	.....	.....	6,377	11,479
				3	.....	41.34	58.66	.....	4.73	.....	.....	.....	.....	.....	7,937	14,287
2 miles west of; N. ½ NE. ¼ sec. 35, T. 15 S., R. 2 E.; Thomas mine (face, 6 room, 1,400 feet due north of opening).	.....	17718	B	1	2.70	35.70	45.87	15.73	4.63	.....	.....	.....	.....	.8	6,587	11,857
				2	.....	36.69	47.14	16.17	4.76	.....	.....	.....	.....	.....	6,769	12,184
				3	.....	43.77	56.23	.....	5.68	.....	.....	.....	.....	.....	8,075	14,535
SUMMIT COUNTY.																
Carter (Wyo.), 50 miles southeast of; prospect, NE. ¼ sec. 8, T. 2. N., R. 18 E.	.....	20894	B	1	2.30	38.45	48.94	10.31	5.16	4.98	69.10	.99	9.46	.2	6,970	12,546
				2	.....	39.35	50.10	10.55	5.28	4.83	70.72	1.01	7.61	.....	7,134	12,841
				3	.....	43.99	56.01	.....	5.90	5.40	79.06	1.13	8.51	.....	7,975	14,355
NE. ¼ sec. 4, T. 2 N., R. 16 E., prospect	.....	*20895	B	1	8.35	32.10	45.01	14.54	.52	3.99	55.67	.96	24.32	.4	4,929	8,872
				2	.....	35.02	49.12	15.86	.57	3.34	60.74	1.05	18.44	.....	5,378	9,680
				3	.....	41.62	58.38	.....	.68	3.97	72.19	1.25	21.91	.....	6,392	11,506
VIRGINIA.																
BUCHANAN COUNTY.																
Big rock; Oliver Elswick mine (face, 60 feet N. 70° E. of opening)	.....	19735	B	1	3.40	28.18	61.44	6.98	.67	5.09	78.30	1.53	7.43	2.0	7,671	13,808
				2	.....	29.17	63.60	7.23	.69	4.88	81.06	1.58	4.56	.....	7,941	14,294
				3	.....	31.44	68.56	.....	.74	5.26	87.37	1.70	4.93	.....	8,560	15,408
Blackey, 1 mile southeast of; Blackey mine, Mohawk bed (face, 450 feet east of main entrance).	.....	19833	B	1	4.06	31.71	61.25	2.98	1.07	5.36	80.91	1.51	8.17	3.2	8,036	14,465
				2	.....	33.05	63.84	3.11	1.12	5.12	84.33	1.57	4.75	.....	8,376	15,077
				3	.....	34.11	65.89	.....	1.16	5.28	87.04	1.62	4.90	.....	8,645	15,561
Same (525 feet S. 80° E. of main entrance)	.....	19834	B	1	3.52	31.91	60.84	3.73	1.48	5.32	80.89	1.53	7.05	2.7	7,994	14,389
				2	.....	33.07	63.06	3.87	1.53	5.11	83.84	1.59	4.06	.....	8,286	14,915
				3	.....	34.40	65.60	.....	1.59	5.32	87.22	1.65	4.22	.....	8,620	15,516
Whitewood; Whitewood mine (600 feet southwest of main entrance)	.....	19924	B	1	2.37	19.56	64.66	13.41	.71	.....	.....	.....	.....	1.7	7,310	13,158
				2	.....	20.04	66.22	13.74	.73	.....	.....	.....	.....	.....	7,488	13,478
				3	.....	23.23	76.77	.....	.85	.....	.....	.....	.....	.....	8,681	15,626
DICKENSON COUNTY.																
Mart, 1 mile northeast of; C. C. Owen's mine, Splash Dam bed (10 feet north of main drift, 75 feet east of opening).	.....	17751	B	1	2.30	29.39	62.19	6.12	.76	.....	.....	.....	.....	1.3	.....	.....
				2	.....	30.08	63.66	6.26	.78	.....	.....	.....	.....	.....	.....	.....
				3	.....	32.09	67.91	.....	.83	.....	.....	.....	.....	.....	.....	.....
Same (15 feet south of main entry, at point 75 feet east of opening).	.....	17752	B	1	2.49	29.21	63.15	5.15	.80	.....	.....	.....	.....	1.6	.....	.....
				2	.....	29.95	64.77	5.28	.82	.....	.....	.....	.....	.....	.....	.....
				3	.....	31.62	68.38	.....	.87	.....	.....	.....	.....	.....	.....	.....

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
VIRGINIA—Continued.																
DICKENSON COUNTY—continued.																
Nora; Nora Mills mine, Widow Kennedy bed (100 yards east of drift mouth).	.....	17559	B	1	2.65	25.46	60.99	10.90	0.70	.....	.....	.....	.....	1.8	7,469	13,444
Same (100 yards northeast of drift mouth)	.....	17560	B	1	2.65	26.01	63.18	8.16	.73	.....	.....	.....	.....	1.7	7,726	13,907
Same (composite of samples 17559 and 17560)	.....	17561	B	1	2.63	26.18	61.71	9.48	.74	4.75	77.60	1.57	5.86	1.8	7,576	13,637
				2	.....	26.89	63.37	9.74	.76	4.58	79.70	1.61	3.61	.....	7,781	14,006
				3	.....	29.79	70.21	.....	.84	5.07	88.30	1.78	4.01	.....	8,621	15,518
Prater (Buchanan County), 4 miles northwest of; Yellow Poplar mine, Upper Banner bed (200 feet east of drift mouth).	.....	17743	B	1	2.78	31.61	58.16	7.45	1.45	.....	.....	.....	.....	1.7	7,686	13,835
				2	.....	32.51	59.82	7.67	1.49	.....	.....	.....	.....	.....	7,906	14,231
				3	.....	35.21	64.79	.....	1.61	.....	.....	.....	.....	.....	8,563	15,413
Same (220 feet N. 85° E. of drift mouth)	.....	17744	B	1	2.98	32.39	58.46	6.17	1.62	.....	.....	.....	.....	1.8	7,793	14,027
				2	.....	33.38	60.26	6.36	1.67	.....	.....	.....	.....	.....	8,032	14,458
				3	.....	35.65	64.35	.....	1.78	.....	.....	.....	.....	.....	8,577	15,439
MONTGOMERY COUNTY.																
Blacksburg, 3½ miles northwest of; Clements Hollow mine, Small bed (about 100 feet in from mouth of abandoned drift).	.....	19359	B	1	3.24	11.39	43.78	41.59	.33	2.89	47.98	.78	6.43	2.2	4,457	8,023
				2	.....	11.77	45.25	42.98	.34	2.61	49.59	.81	3.67	.....	4,606	8,291
				3	.....	20.64	79.36	.....	.60	4.58	86.97	1.42	6.43	.....	8,078	14,540
4 miles northwest of; Plunkett & Wall mine; Large bed (down slope 300 feet northeast, along entry about 100 feet).	.....	19357	B	1	2.52	12.38	67.50	17.60	.51	3.63	72.83	.85	4.58	1.9	6,867	12,361
				2	.....	12.70	69.24	18.06	.52	3.44	74.72	.87	2.39	.....	7,045	12,681
				3	.....	15.50	84.50	.....	.63	4.20	91.19	1.06	2.92	.....	8,598	15,476
5 miles northwest of; Seymour-Price mine, Large bed (350 feet down main slope, and 150 feet northeast along bottom level).	.....	19360	B	1	4.68	11.49	65.39	18.44	.56	3.66	70.19	.87	6.28	3.9	6,569	11,824
				2	.....	12.05	68.60	19.35	.59	3.29	73.64	.91	2.22	.....	6,892	12,406
				3	.....	14.94	85.06	.....	.73	4.08	91.31	1.13	2.75	.....	8,545	15,381
3½ miles north of; Slusser mine, Large bed (about 900 feet west on main entry and 25 feet north on side entry).	.....	19358	B	1	1.88	12.34	66.81	18.97	.67	3.54	72.33	.85	3.64	1.1	6,754	12,157
				2	.....	12.58	68.09	19.33	.68	3.39	73.72	.87	2.01	.....	6,884	12,391
				3	.....	15.59	84.41	.....	.84	4.20	91.38	1.08	2.50	.....	8,533	15,359
Same (along airway, 25 feet northeast of main entry, 350 yards from drift mouth).	.....	22629	B	1	1.59	12.31	68.14	17.96	.47	.....	.....	.....	.....	.4	6,857	12,343
				2	.....	12.51	69.24	18.25	.48	.....	.....	.....	.....	.....	6,968	12,542
				3	.....	15.30	84.70	.....	.59	.....	.....	.....	.....	.....	8,523	15,341

Same		22630	B	1	1.93	13.53	69.77	14.77	.63					.6	7,060	12,708
				2		13.80	71.14	15.06	.64						7,199	12,598
				3		16.25	83.75		.75						8,475	15,255
Same		22631	B	1	1.81	11.79	53.52	32.88	.33					.8	5,431	9,776
				2		12.01	54.51	33.48	.34						5,531	9,956
				3		18.05	81.95		.51						8,315	14,967
Christiansburg, 3½ miles northwest of; Lyken Hill mine, Large bed (350 feet along main slope and east 200 feet on east entry).		19403	B	1	1.67	9.36	66.65	22.32	.71	3.19	69.24	.81	3.73	.9	6,428	11,570
				2		9.52	67.78	22.70	.72	3.05	70.42	.82	2.29		6,537	11,767
				3		12.32	87.68		.93	3.95	91.10	1.06	2.96		8,457	15,223
PULASKI COUNTY.																
Dublin, 5½ miles north-northwest of; Cloyd mine, "Upper" bed (125 feet west of mine mouth).		20722	B	1	2.47	10.77	63.13	23.63	.41					1.9	6,248	11,246
				2		11.04	64.73	24.23	.42						6,406	11,531
				3		14.57	85.43		.55						8,455	15,219
Parrott; Parrott mine, Large bed (west entry, 100 feet west of shaft landing).		19431	B	1	2.37	11.61	63.29	22.73	.67	3.37	67.26	.75	5.22	1.4	6,283	11,309
				2		11.89	64.83	23.28	.69	3.19	68.89	.77	3.18		6,436	11,585
				3		15.50	84.50		.90	4.16	89.79	1.00	4.15		8,389	15,100
RUSSELL COUNTY.																
Dante, 2 miles northeast of; No. 2 mine, Upper Banner bed (2,400 feet S. 18° E. of entrance 3 drift on McClure).		18128	B	1	1.81	35.30	55.76	7.13	.58					1.0	7,801	14,012
Same (2,750 feet S. 78° E. of 5 drift entrance)		18129	B	1	2.35	36.33	55.11	6.21	.52					1.4	7,838	14,108
Same (3,400 feet S. 85° W. of No. 1 drift entrance, on Middle McClure).		18130	B	1	1.61	36.73	55.31	6.35	.58					.8	7,872	14,170
Same (composite of samples 18128, 18129, and 18130)		18131	B	1	1.84	36.15	55.48	6.53	.54	5.25	79.28	1.49	6.91	1.1	7,832	14,098
				2		36.83	56.52	6.65	.55	5.14	80.76	1.52	5.38		7,978	14,360
				3		39.45	60.55		.59	5.51	86.51	1.63	5.76		8,546	15,383
Dante, 1 mile east of; No. 52 mine, Lower Banner bed (325 feet northeast of entrance to No. 0 drift).		18122	B	1	2.51	35.55	56.23	5.71	.66					1.6	7,931	14,276
Same (1,700 feet southwest of entrance to No. 1 drift)		18123	B	1	1.99	35.67	54.52	7.82	.66					1.1	7,683	13,829
Same (composite of samples 18122 and 18123)		18124	B	1	2.26	35.51	55.52	6.71	.67	5.26	78.84	1.69	6.83	1.4	7,780	14,004
				2		36.33	56.80	6.87	.69	5.13	80.66	1.73	4.92		7,960	14,328
				3		39.01	60.99		.74	5.51	86.61	1.86	5.28		8,547	15,385
1 mile northwest of; No. 103 mine, Kennedy bed (260 feet N. 55° W. of drift mouth)		18121	B	1	2.89	31.85	57.84	7.42	1.78					1.9	7,653	13,775
				2		32.80	59.56	7.64	1.83						7,881	14,186
				3		35.51	64.49		1.98						8,533	15,359
Della, 3 miles north of; Flat Rock mine (face of 1 left entry, 750 feet N. 30° E. of main entrance).		25367	B	1	2.14	35.83	52.75	9.28	.82					.8	7,467	13,441
Same (face of 2 right entry, 900 feet S. 75° E. of main entrance)		25368	B	1	1.87	35.51	53.11	9.51	.81					.4	7,474	13,453
Same (composite of samples 25367 and 25368)		25369	B	1	1.99	36.11	52.57	9.33	.83	5.21	75.37	1.17	8.09	.6	7,472	13,450
				2		36.84	53.64	9.52	.85	5.09	76.90	1.19	6.45		7,624	13,723
				3		40.72	59.28		.94	5.63	84.99	1.32	7.12		8,426	15,167
½ mile south of; Jackson mine (600 feet northwest of opening)		22346	B	1	2.44	34.20	50.72	12.64	.94					1.1	7,140	12,852
				2		35.06	51.98	12.96	.96						7,319	13,174
				3		40.28	59.72		1.10						8,409	15,136
Drill; Drill mine, Kennedy bed (150 yards northeast of opening)		19484	B	1	2.12	32.37	58.72	6.79	1.01					.8		
				2		33.07	59.99	6.94	1.03							
				3		35.54	64.46		1.11							
1 mile south of; Sandy Ridge mine, Kennedy bed (room 20 feet to right of entry, 150 feet north of opening).		19528	B	1	3.20	33.06	57.71	6.03	.96					1.8		
				2		34.15	59.62	6.23	.99							
				3		36.42	63.58		1.06							
Same (170 feet S. 70° W. of entrance to north drift)		22345	B	1	4.67	30.76	59.43	5.14	.96	5.43	78.33	1.40	8.74	3.5	7,758	13,964
				2		32.27	62.34	5.39	1.01	5.15	82.17	1.47	4.81		8,138	14,648
				3		34.11	65.89		1.07	5.44	86.85	1.55	5.09		8,602	15,484

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
VIRGINIA—Continued.																
RUSSELL COUNTY—continued.																
Slemp, 1 mile northeast of; No. 201 mine, No. 4 bed (5,200 feet N. 33° W. of shaft).	.....	18239	B	1	1.81	31.43	60.28	6.48	0.52	.....	.....	.....	.....	1.0	7,878	14,180
Same (1,600 feet N. 68° W. of shaft)	.....	18240	B	1	2.51	31.86	59.54	6.09	.44	.....	.....	.....	.....	1.8	7,818	14,072
Same (2,900 feet N. 27° W. of shaft)	.....	18241	B	1	2.45	32.46	58.37	6.72	.49	.....	.....	.....	.....	1.9	7,790	14,022
Same (composite of samples 18239, 18240, and 18241)	.....	18242	B	1	2.19	31.95	59.36	6.50	.46	5.11	79.69	1.04	7.20	1.6	7,839	14,110
				2	.....	32.67	60.68	6.65	.47	4.98	81.48	1.06	5.36	.....	8,015	14,427
				3	.....	35.00	65.00	.....	.50	5.33	87.28	1.14	5.75	.....	8,586	15,455
Wilder; No. 6 mine, Upper Banner bed (3,000 feet S. 71° W. of No. 1 opening).	.....	18235	B	1	3.35	35.73	54.96	5.96	.55	.....	.....	.....	.....	2.4	7,759	13,966
Same (5 room, 1,250 feet S. 35° W. of No. 3 opening)	.....	18236	B	1	3.23	35.40	55.07	6.30	.59	.....	.....	.....	.....	2.4	7,759	13,966
Same (4,000 feet S. 10° W. of No. 3 opening)	.....	18237	B	1	3.30	35.10	56.86	4.74	.50	.....	.....	.....	.....	2.4	7,925	14,265
Same (composite of samples 18235, 18236, and 18237)	.....	18238	B	1	3.34	35.05	55.90	5.71	.55	5.37	78.72	1.37	8.28	2.4	7,822	14,080
				2	.....	36.26	57.83	5.91	.57	5.17	81.44	1.42	5.49	.....	8,093	14,567
				3	.....	38.54	61.46	.....	.61	5.49	86.55	1.51	5.84	.....	8,601	15,482
Wilder; No. 55 mine, Lower Banner bed (3 main entry, 900 feet S. 60° W. of No. 3 drift mouth).	.....	18243	B	1	3.13	33.67	57.29	5.91	.79	.....	.....	.....	.....	2.4	7.859	14,146
Same (2,500 feet S. 35° E. of No. 5 main drift mouth)	.....	18244	B	1	2.43	34.60	57.31	5.66	83	.....	.....	.....	.....	1.6	7,944	14,299
Same (1,300 feet N. 35° W. of No. 2 drift mouth)	.....	18245	B	1	2.74	33.73	57.84	5.69	.78	.....	.....	.....	.....	2.0	7,920	14,256
Same (composite of samples 18243, 18244, and 18245)	.....	18246	B	1	2.72	33.82	57.68	5.78	.83	5.27	79.33	1.29	7.50	2.0	7,914	14,245
				2	.....	34.77	59.29	5.94	.85	5.11	81.55	1.33	5.22	.....	8,136	14,645
				3	.....	36.97	63.03	.....	.90	5.43	86.70	1.41	5.56	.....	8,650	15,570
WISE COUNTY.																
Pardee, 1 mile northwest of; Pardee (No. 1) mine, Pardee (Limestone or Parsons) bed (2 right entry, main 3-face entry, 2,500 feet N. 15° W. of mine mouth).	.....	22277	B	1	2.96	35.92	55.52	5.60	.78	.....	.....	.....	.....	1.4	7,762	13,972
Same (face of main 3-face entry, 2,000 feet north of mine mouth).	.....	22278	B	1	2.93	36.14	56.15	4.78	.94	.....	.....	.....	.....	1.3	7,810	14,058
Same (6 left entry, main entry, 2,500 feet northwest of mine mouth).	.....	22279	B	1	2.71	36.33	54.48	6.48	1.37	.....	.....	.....	.....	1.1	7,692	13,846

Same (composite of samples 22277, 22278, and 22279)	.....	22280	B	1	2.85	36.13	55.41	5.61	1.05	5.49	78.17	1.67	8.01	1.3	7,754	13,957
				2	.....	37.19	57.04	5.77	1.08	5.32	80.46	1.72	5.65	.....	7,981	14,366
				3	.....	39.47	60.53	.....	1.15	5.65	85.38	1.83	5.99	.....	8,469	15,244
Toms Creek; 1½ miles northwest of, Cranesnest No. 1 mine, Upper Banner bed (1,500 feet southwest of entrance to main entry, on Caney Creek).	.....	18226	B	1	2.46	33.38	59.38	4.78	.58	.....	.....	.....	.....	1.5	8,034	14,461
Same (500 feet northeast of mouth of main opening, on Caney Creek).	.....	18227	B	1	2.34	32.87	59.86	4.93	.53	.....	.....	.....	.....	1.5	8,033	14,459
Same (4,100 feet southeast of mouth of main opening, on Caney Creek).	.....	18228	B	1	2.28	32.69	59.26	5.77	.51	.....	.....	.....	.....	1.4	7,985	14,373
Same (composite of samples 18226, 18227, and 18228)	.....	18229	B	1	2.29	32.87	59.62	5.22	.54	5.18	80.78	1.57	6.71	1.5	8,011	14,420
				2	.....	33.64	61.02	5.34	.55	5.05	82.67	1.61	4.78	.....	8,198	14,756
				3	.....	35.54	64.46	.....	.58	5.33	87.33	1.70	5.06	.....	8,660	15,588
WYTHE COUNTY.																
Max Meadows, 3 miles north of; Ellison & Johnson prospect, Upper (or Large) bed (10 feet in from opening).	.....	20721	B	1	6.13	11.14	49.69	33.04	.32	.....	.....	.....	.....	5.2	4,973	8,951
				2	.....	11.87	52.93	35.20	.34	.....	.....	.....	.....	.....	5,298	9,536
				3	.....	18.32	81.68	.....	.52	.....	.....	.....	.....	.....	8,176	14,717
WASHINGTON.																
KING COUNTY.																
Ravensdale; No. 1 mine; NE. ¼ sec. 36, T. 22 N., R. 6 E. (10 feet west of 37 chute, main entry, 3 east level).	.....	*23495	A	1	9.93	37.20	46.65	6.22	.33	5.92	66.22	1.66	19.65	4.7	6,535	11,763
				2	.....	41 30	51.79	6.91	.37	5.35	73.52	1.84	12.01	.....	7,255	13,059
				3	.....	44.36	55.64	.....	.40	5.75	78.98	1.98	12.89	.....	7,793	14,027
WHATCOM COUNTY.																
Glacier, 4 miles south of; SE. ¼ sec. 29, T. 39 N., R. 7 E., Discovery Tunnel (face of entry, 750 feet from mouth).	.....	19722	B	1	4.36	7.45	75.96	12.23	.96	2.97	77.75	.98	5.11	2.6	6,996	12,593
				2	.....	7.79	79.42	12.79	1.00	2.60	81.30	1.02	1.29	.....	7,315	13,167
				3	.....	8.93	91.07	.....	1.15	2.98	93.23	1.17	1.47	.....	8,388	15,098
Same (entry, 300 feet from opening)	.....	19723	B	1	5.51	6.85	77.71	9.93	1.02	.....	.....	.....	.....	3.2	7,115	12,807
				2	.....	7.25	82.24	10.51	1.08	.....	.....	.....	.....	.....	7,530	13,554
				3	.....	8.10	91.90	.....	1.21	.....	.....	.....	.....	.....	8,414	15,145
4 miles south of; SE. ¼ sec. 30, T. 39 N., R. 7 E.; Smith Tunnel mine (200 feet from opening).	.....	19724	B	1	5.82	8.14	77.04	9.00	.91	.....	.....	.....	.....	4.7	7,204	12,967
				2	.....	8.64	81.80	9.56	.97	.....	.....	.....	.....	.....	7,649	13,768
				3	.....	9.55	90.45	.....	1.07	.....	.....	.....	.....	.....	8,457	15,223
3 miles southwest of; SE. ¼ sec. 24, T. 39 N., R. 6 E.; prospect (20 feet from surface).	.....	19725	B	1	4.34	8.95	77.19	9.52	1.06	.....	.....	.....	.....	3.6	7,417	13,351
				2	.....	9.36	80.69	9.95	1.11	.....	.....	.....	.....	.....	7,754	13,957
				3	.....	10.39	89.61	.....	1.23	.....	.....	.....	.....	.....	8,611	15,500
3 miles southwest of; SW. ¼ sec. 24, T. 39 N., R. 6 E.; prospect (about 4 feet from opening).	.....	19726	B	1	10.70	13.07	68.77	7.46	.94	.....	.....	.....	.....	7.4	6,612	11,902
				2	.....	14.64	77.01	8.35	1.05	.....	.....	.....	.....	.....	7,404	13,327
				3	.....	15.97	84.03	.....	1.15	.....	.....	.....	.....	.....	8,079	14,542
WEST VIRGINIA.																
CLAY COUNTY.																
Widen; Rich Run mine, No. 5 or Block bed (face of 1 east entry, 5½ entry, 2,000 feet S. 60° E. of mine mouth, 800 feet from outcrop).	.....	21816	B	1	2.49	35.63	54.92	6.96	.86	.....	.....	.....	.....	1.0	7,593	13,667
Same (upper, 11-inch, bench)	.....	21892	B	1	3.09	36.46	54.41	6.04	1.49	.....	.....	.....	.....	1.5	7,669	13,804
				2	.....	37.62	56.15	6.23	1.54	.....	.....	.....	.....	.....	7,914	14,245
				3	.....	40.12	59.88	.....	1.64	.....	.....	.....	.....	.....	8,439	15,190

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
WEST VIRGINIA—Continued.																
CLAY COUNTY—continued.																
Widen; Rich Run mine, No. 5 or Block bed (15 room, 2 right entry, 5½ south entry, 1,200 feet southwest of mine mouth).	.....	21817	B	1	2.84	34.83	54.14	8.19	1.09	.....	.....	.....	.....	1.5	7,472	13,450
Same (composite of samples 21816 and 21817)	.....	21818	B	1	2.64	35.48	54.32	7.56	.98	5.33	75.89	1.48	8.76	1.2	7,532	13,558
				2	.....	36.44	55.80	7.76	1.01	5.18	77.95	1.52	6.58	.....	7,736	13,925
				3	.....	39.50	60.50	.....	1.09	5.62	84.51	1.65	7.13	.....	8,387	15,097
Same (face of 5 room, 3 right heading, 1,600 feet south of opening).	.....	23587	A	1	2.76	34.45	55.39	7.40	.83	.....	.....	.....	.....	1.3	7,590	13,662
Same (face of 31 room, 6 south heading, 2,500 feet N. 86° W. of opening).	.....	23588	A	1	2.89	35.08	55.71	6.32	.77	.....	.....	.....	.....	1.3	7,669	13,804
Same (face of 6 room, 1 left entry, 2 right heading, 2,500 feet west from opening).	.....	23589	A	1	3.20	35.65	52.75	8.40	.74	.....	.....	.....	.....	1.8	7,426	13,367
Same (face of 6 room, 4 east heading, 2,300 feet S. 20° E. from opening).	.....	23590	A	1	2.67	35.75	56.44	5.14	.76	.....	.....	.....	.....	1.2	7,747	13,945
Same (face of 3 room, 3 south heading, 1,600 feet S. 45° E. from opening).	.....	23591	A	1	2.54	36.06	54.25	7.15	.68	.....	.....	.....	.....	1.1	7,577	13,639
Same (face of 8 room, 2 east heading, 1,900 feet S. 30° E. from opening).	.....	23592	A	1	2.81	35.90	54.39	6.90	.78	.....	.....	.....	.....	1.4	7,614	13,705
Same (12 pillar, 1 straight heading, 900 feet S. 86° E. from pit mouth).	.....	23593	A	1	2.77	35.71	54.66	6.86	1.06	.....	.....	.....	.....	1.3	7,600	13,680
Same (composite of samples 23587, 23588, 23589, 23590, 23591, 23592, and 23593).	.....	23594	A	1	2.78	35.51	54.73	6.98	.82	5.24	77.28	1.54	8.14	1.3	7,611	13,700
				2	.....	36.53	56.29	7.18	.84	5.07	79.49	1.58	5.84	.....	7,829	14,092
				3	.....	39.36	60.64	.....	.91	5.46	85.64	1.70	6.29	.....	8,435	15,183
FAYETTE COUNTY.																
Boomer, 1½ miles east of; No. 2 North mine, Eagle bed (10,800 feet northeast from pit mouth).	.....	23487	A	1	2.84	33.26	59.86	4.04	.61	.....	.....	.....	.....	1.5	7,986	14,375
Same (11,000 feet N. 35° W. from pit mouth)	.....	23488	A	1	3.39	33.36	58.79	4.46	.84	.....	.....	.....	.....	2.0	7,892	14,206
Same (composite of samples 23487 and 23488)	.....	23489	A	1	2.96	33.57	59.18	4.29	.78	5.49	80.01	1.60	7.83	1.7	7,940	14,292
				2	.....	34.59	60.99	4.42	.80	5.32	82.45	1.65	5.36	.....	8,182	14,728
				3	.....	36.19	63.81	.....	.84	5.57	86.26	1.73	5.60	.....	8,560	15,408

Layland, 2 miles north of; Layland No. 3 mine, Fire Creek bed (left rib, 3 left entry, tunnel entry just inby last break-through).	.....	21502	A	1	3.02	20.63	70.23	6.12	.89	.....	.....	.....	.....	2.5	7,945	14,303
Same (left rib of tunnel entry, 6 feet from face)	.....	21503	A	1	2.21	20.21	70.34	7.24	.74	.....	.....	.....	.....	1.7	7,853	14,135
Same (6 feet from face of 6 left entry, No. 4 mine, on inby corner of last break-through).	.....	21504	A	1	2.92	20.62	70.03	6.43	1.09	.....	.....	.....	.....	2.4	7,884	14,191
Same (50 feet from face of main heading, at inby corner of last break-through).	.....	21505	A	1	2.70	19.64	71.64	6.02	.72	.....	.....	.....	.....	2.1	7,946	14,303
Same (75 feet from face of 10 left entry, on left rib)	.....	21506	A	1	4.04	19.07	68.83	8.06	.76	.....	.....	.....	.....	3.5	7,627	13,729
Same (composite of samples 21502, 21503, 21504, 21505, and 21506).	.....	21507	A	1	2.90	20.55	69.72	6.83	.86	4.84	81.25	1.58	4.64	2.4	7,861	14,150
				2	.....	21.16	71.81	7.03	.89	4.66	83.68	1.63	2.11	.....	8,096	14,573
				3	.....	22.76	77.24	.....	.96	5.01	90.01	1.75	2.27	.....	8,708	15,674
Longacre, ½ mile southeast of; No. 114 mine, No. 2 or Gas bed (face of 6 room, 10 east entry, 13 south heading, 11,700 feet N. 85° E. from pit mouth).	.....	23986	A	1	2.56	36.22	56.99	4.23	.90	.....	.....	.....	.....	1.5	7,975	14,355
Same (face of 1 room, 6 east entry, 13 south heading, 11,450 feet N. 76° E. from pit mouth).	.....	23987	A	1	2.55	35.83	56.70	4.92	.81	.....	.....	.....	.....	1.6	7,942	14,296
Same (face of main east heading, 11,650 feet N. 75° E. from pit mouth).	.....	23988	A	1	2.30	35.03	56.95	5.72	.91	.....	.....	.....	.....	1.3	7,869	14,164
Same (face of 3 room, 3 east entry, 13 north heading, 11,600 feet east from pit mouth).	.....	23989	A	1	2.38	36.36	57.51	3.75	.96	.....	.....	.....	.....	1.3	8,046	14,483
Same (face of 1 room, 8 east entry, 13 south heading, 11,500 feet N. 80° E. from pit mouth).	.....	23990	A	1	2.32	33.65	55.89	8.14	1.44	.....	.....	.....	.....	1.3	7,633	13,739
Same (face of 13 north heading, 11,650 feet N. 73° E. from pit mouth).	.....	23991	A	1	2.61	35.12	55.68	6.59	1.34	.....	.....	.....	.....	1.6	7,766	13,979
Same (composite of samples 23986, 23987, 23988, 23989, 23990, and 23991).	.....	23992	A	1	2.42	35.45	56.68	5.45	1.02	5.37	78.92	1.52	7.72	1.5	7,866	14,159
				2	.....	36.33	58.10	5.57	1.05	5.23	80.88	1.56	5.71	.....	8,061	14,510
				3	.....	38.47	61.53	.....	1.11	5.54	85.66	1.65	6.04	.....	8,537	15,367
Marting; No. 1 mine, No. 2 or Gas bed (face of 21 room, 3 left heading, 4,400 feet S. 70° E. from pit mouth).	.....	24055	A	1	2.33	34.93	55.76	6.98	.90	.....	.....	.....	.....	1.0	7,717	13,891
Same (face of 21 room, 4 left heading, 4,700 feet S. 65° E. from pit mouth).	.....	24056	A	1	2.73	35.33	57.31	4.63	1.00	.....	.....	.....	.....	1.5	7,872	14,170
Same (face of 10 room, 5 left heading, 4,000 feet S. 55° E. from pit mouth).	.....	24057	A	1	2.21	34.33	56.63	6.83	1.04	.....	.....	.....	.....	1.1	7,726	13,907
Same (face of 11 room, 6 left heading, 4,200 feet S. 50° E. from pit mouth).	.....	24058	A	1	2.72	34.31	56.47	6.50	.74	.....	.....	.....	.....	1.5	7,738	13,928
Same (face of 5 room, 1 left heading, 3,200 feet N. 80° E. from pit mouth).	.....	24059	A	1	2.58	35.24	56.06	6.12	.95	.....	.....	.....	.....	1.3	7,773	13,991
Same (face of 15 room, 2 left heading, 4,100 feet S. 75° E. from pit mouth).	.....	24060	A	1	2.40	35.24	56.43	5.93	.84	.....	.....	.....	.....	1.2	7,788	14,018
Same (composite of samples 24055, 24056, 24057, 24058, 24059, and 24060).	.....	24061	A	1	2.52	34.86	56.42	6.20	.85	5.30	78.82	1.56	7.27	1.3	7,759	13,966
				2	.....	35.76	57.88	6.36	.87	5.15	80.86	1.60	5.16	.....	7,960	14,328
				3	.....	38.19	61.81	.....	.93	5.50	86.35	1.71	5.51	.....	8,500	15,300
HARRISON COUNTY.																
Lost Creek, 2 miles southwest of; Calif mine, Redstone bed (face of 2 room, Lost Creek heading, 950 feet southeast of mine mouth).	.....	22321	A	1	4.26	36.98	49.65	9.11	1.76	.....	.....	.....	.....	2.8	7,231	13,016
Same (face of McWhorter entry, 1,300 feet southeast of mine mouth).	.....	22322	A	1	3.00	38.72	49.57	8.71	2.52	.....	.....	.....	.....	1.6	7,393	13,307
Same (face of 3 room, Boone or Davis heading, 900 feet southeast of mine mouth).	.....	22323	A	1	2.79	39.35	49.51	8.35	2.69	.....	.....	.....	.....	1.4	7,420	13,356
Same (face of Lost Creek heading, 1,000 feet east of opening)	.....	22324	A	1	3.89	36.45	51.30	8.36	1.30	.....	.....	.....	.....	2.3	7,335	13,203
Same (pillar in 7 room, 2 right entry, 550 feet southwest of mine mouth).	.....	22325	A	1	3.57	38.75	52.63	5.05	1.70	.....	.....	.....	.....	1.9	7,645	13,761

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
WEST VIRGINIA—Continued.																
HARRISON COUNTY—continued.																
Lost Creek, 2 miles southwest of: Calif mine, Redstone bed (composite of samples 22321, 22322, 22323, 22324, and 22325).	.....	22326	A	1	3.46	38.13	50.47	7.94	2.00	5.48	73.74	1.23	9.61	2.0	7,412	13,342
				2	.....	39.50	52.28	8.22	2.07	5.28	76.38	1.27	6.78	.....	7,677	13,819
				3	.....	43.04	56.96	.....	2.26	5.75	83.22	1.38	7.39	.....	8,365	15,057
1¼ miles southwest of; Righter No. 1 mine, Redstone bed (50 feet from face of 9 room, 1 left heading, 450 feet east of mine mouth).	.....	22336	A	1	3.76	36.67	53.96	5.61	1.07	.....	.....	.....	.....	2.0	7,567	13,621
Same (15 room, 1 left heading, 650 feet southeast of mine mouth).	.....	22335	A	1	3.73	36.88	53.94	5.45	1.23	.....	.....	.....	.....	2.1	7,585	13,653
Same (10 feet from face of 11 room, 2 left heading, 850 feet southeast of mine mouth).	.....	22334	A	1	3.75	36.93	52.00	7.32	1.78	.....	.....	.....	.....	2.2	7,422	13,360
Same (face of 7 room, 1 right heading, 650 feet southwest of mine mouth).	.....	22332	A	1	3.55	39.27	51.77	5.41	2.02	.....	.....	.....	.....	2.0	7,615	13,707
Same (face of 2 room, 1 right heading, 1 right heading, 800 feet southwest of mine mouth).	.....	22333	A	1	2.93	39.02	52.69	5.36	1.93	.....	.....	.....	.....	1.4	7,690	13,842
Same (composite of samples 22332, 22333, 22334, 22335, and 22336).	.....	22337	A	1	3.55	38.01	52.56	5.88	1.61	5.48	75.93	1.34	9.76	1.9	7,575	13,635
				2	.....	39.41	54.49	6.10	1.67	5.27	78.72	1.39	6.85	.....	7,854	14,137
				3	.....	41.97	58.03	.....	1.78	5.61	83.84	1.48	7.29	.....	8,365	15,057
KANAWHA COUNTY.																
Putney, ¼ mile east of; Putney No. 1 mine, No. 5 Block bed (face of 22 room, 22 right heading, 6,500 feet N. 75° E. from pit mouth).	.....	23892	A	1	3.37	35.19	51.97	9.47	.90	.....	.....	.....	.....	1.7	7,268	13,082
Same (face of 2 room, 26 right heading, 7,100 feet N. 55° E. from pit mouth).	.....	23893	A	1	3.20	36.59	50.84	9.37	.77	.....	.....	.....	.....	1.4	7,296	13,133
Same (face of 28 right heading, 7,500 feet N. 70° E. from pit mouth).	.....	23894	A	1	3.75	35.44	50.41	10.40	.81	.....	.....	.....	.....	1.8	7,136	12,845
Same (face of 30 left heading, 7,200 feet N. 46° E. from pit mouth).	.....	23895	A	1	3.33	34.65	52.03	9.99	1.04	.....	.....	.....	.....	1.6	7,199	12,958
Same (face of 2 room, 28 left heading, 7,800 feet N. 45° E. from pit mouth).	.....	23896	A	1	3.50	36.00	52.07	8.43	1.82	.....	.....	.....	.....	1.8	7,327	13,189
Same (composite of samples 23892, 23893, 23894, 23895, and 23896).	.....	23897	A	1	3.35	35.82	51.31	9.52	1.10	5.28	73.23	1.42	9.45	1.7	7,243	13,037
				2	.....	37.06	53.09	9.85	1.14	5.08	75.77	1.47	6.69	.....	7,494	13,489
				3	.....	41.11	58.89	.....	1.26	5.64	84.05	1.63	7.42	.....	8,313	14,963

Ward, ½ mile south of; No. 3 mine, Coalburg bed (face of 12 room, 31 heading, 10,750 feet S. 30° W. from opening).	.....	23919	A	1	3.65	35.98	52.74	7.63	.71	.....	.....	.....	.....	2.2	7,467	13,441
Same (face of 2 room, 6 butt heading, 10,750 feet S. 45° W. from opening).	.....	23920	A	1	3.10	36.42	53.59	6.89	.67	.....	.....	.....	.....	1.6	7,559	13,606
Same (face of 21 room, 25 heading, 10,400 feet south from opening)	.....	23921	A	1	4.22	34.13	53.58	8.07	.72	.....	.....	.....	.....	2.8	7,359	13,246
Same (face of 27 room, 24 heading, 10,650 feet S. 10° E. from opening).	.....	23922	A	1	3.22	34.44	52.96	9.38	.73	.....	.....	.....	.....	1.8	7,310	13,158
Same (face of 7 room, 20 heading, 10,600 feet S. 45° E. from opening).	.....	23923	A	1	3.08	34.36	52.71	9.85	.71	.....	.....	.....	.....	1.6	7,287	13,117
Same (face of 5 room, 3 north heading, 1 east heading, 10,800 feet S. 25° E. from opening).	.....	23924	A	1	3.85	33.95	54.77	7.43	.77	.....	.....	.....	.....	2.3	7,448	13,406
Same (composite of samples 23919, 23920, 23921, 23922, 23923, and 23924).	.....	23925	A	1	3.44	35.20	53.08	8.28	.70	5.31	75.06	1.41	9.24	2.0	7,391	13,304
				2	.....	36.45	54.98	8.57	.72	5.11	77.73	1.46	6.41	.....	7,654	13,777
				3	.....	39.87	60.13	.....	.79	5.59	85.01	1.60	7.01	.....	8,371	15,068
LOGAN COUNTY.																
Accoville, 0.4 mile southeast of; Island Creek mine, Cedar Grove bed (face of main west entry, 1,400 feet west from opening).	.....	23414	A	1	2.79	35.19	56.81	5.21	1.33	.....	.....	.....	.....	1.7	7,825	14,085
Same (face of 1 west entry, south entry 1,600 feet S. 45° W. from opening).	.....	23415	A	1	2.35	36.42	55.69	5.54	1.17	.....	.....	.....	.....	1.2	7,842	14,116
Same (face of main south entry, 1,400 feet S. 30° W. from opening)	.....	23416	A	1	3.01	34.95	57.71	4.33	1.13	.....	.....	.....	.....	1.7	7,893	14,207
Same (face of 1 west entry, north entry 1,400 feet N. 80° W. from opening).	.....	23417	A	1	2.73	33.65	56.13	7.49	1.29	.....	.....	.....	.....	1.5	7,645	13,761
Same (face of main east entry, 700 feet S. 15° W. from opening)..	.....	23418	A	1	2.74	35.08	56.45	5.74	1.29	.....	.....	.....	.....	1.6	7,814	14,065
Same (composite o samples 23414, 23415, 23416, 23417, and 23418).	.....	23419	A	1	2.75	34.91	56.68	5.66	1.24	5.34	78.63	1.43	7.70	1.5	7,817	14,071
				2	.....	35.90	58.28	5.82	1.28	5.17	80.86	1.47	5.40	.....	8,038	14,468
				3	.....	38.12	61.88	.....	1.36	5.49	85.86	1.56	5.73	.....	8,535	15,363
¼ mile southeast of; Big Eagle mine, Campbell Creek bed (face of air course, 2 west entry, south entry 2,100 feet S. 45° W. from opening).	.....	23407	A	1	3.55	31.53	58.33	6.59	.60	.....	.....	.....	.....	2.4	7,652	13,774
Same (face of 1 west entry, north entry 1,200 feet west from opening).	.....	23408	A	1	2.95	32.17	58.89	5.99	.61	.....	.....	.....	.....	1.8	7,786	14,015
Same (face of 15 room, 1 west entry, south entry 1,600 feet S. 65° W. from opening).	.....	23409	A	1	3.46	31.48	58.81	6.25	.59	.....	.....	.....	.....	2.4	7,705	13,869
Same (face of 3 room, 4 west entry, south entry 1,500 feet S. 30° W. from opening).	.....	23410	A	1	3.03	32.49	59.13	5.35	.60	.....	.....	.....	.....	1.9	7,840	14,112
Same (face of 3 west entry, south entry, 1,700 feet S. 45° W. from opening).	.....	23411	A	1	3.13	32.10	59.01	5.76	.72	.....	.....	.....	.....	2.0	7,786	14,015
Same (face of main north entry, 900 feet N. 60° W. from opening)	.....	23412	A	1	2.28	31.93	60.40	5.39	.64	.....	.....	.....	.....	1.1	7,875	14,175
Same (composite of samples 23107, 23408, 23409, 23410, 23411, and 23412).	.....	23413	A	1	3.01	32.29	58.78	5.92	.65	5.23	78.78	1.46	7.96	1.9	7,767	13,981
				2	.....	33.29	60.61	6.10	.67	5.05	81.22	1.51	5.45	.....	8,008	14,414
				3	.....	35.45	64.55	.....	.71	5.38	86.50	1.61	5.80	.....	8,529	15,352
Craneco, ½ mile southeast of; Lorado No. 1 mine, Cedar Grove or Island Creek bed (face of main south heading, 1,700 feet south from opening).	.....	23508	A	1	2.84	33.03	59.85	4.28	.64	.....	.....	.....	.....	1.7	7,994	14,389
Same (face of 4 east heading, main south heading, 1,280 feet S. 45° E. from opening).	.....	23509	A	1	2.87	33.64	58.43	5.06	.66	.....	.....	.....	.....	1.8	7,914	14,245
Same (face of 10 room, 2 west heading, main south heading, 960 feet west from opening).	.....	23510	A	1	3.06	33.16	58.19	5.59	.75	.....	.....	.....	.....	1.9	7,829	14,092
Same (face of 7 room, 2 east heading, main south heading, 920 feet S. 45° E. from opening).	.....	23511	A	1	2.89	33.06	58.89	5.16	.75	.....	.....	.....	.....	1.8	7,921	14,258

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
WEST VIRGINIA—Continued.																
LOGAN COUNTY—continued.																
Craneco, ½ mile southeast of: Lorado No. 1 mine, Cedar Grove or Island Creek bed (face of 4 west heading, main south heading, 1,375 feet S. 45° E. from opening).	.....	23512	A	1	3.13	32.39	58.37	6.11	0.75	.....	.....	.....	.....	2.0	7,778	14,000
Same (composite of samples 23508, 23509, 23510, 23511, and 23512).	.....	23513	A	1	2.95	32.87	58.98	5.20	.70	5.36	79.82	1.46	7.46	1.8	7,910	14,238
				2	.....	33.87	60.77	5.36	.72	5.18	82.25	1.50	4.99	.....	8,150	14,670
				3	.....	35.79	64.21	.....	.76	5.47	86.91	1.58	5.28	.....	8,611	15,500
Earling, ½ mile northwest of; Earling No. 1 mine, Campbell Creek (No. 2 or Gas bed (face of 9 A entry, 2,300 feet east from opening).	.....	23338	A	1	3.24	33.05	58.75	4.96	.75	.....	.....	.....	.....	1.8	7,817	14,071
Same (face of C flat entry, 2,200 feet N. 45° E. from opening)	.....	23339	A	1	3.22	34.25	58.65	3.88	.67	.....	.....	.....	.....	1.9	7,902	14,224
Same (face of 1 room, 5 B entry, 1,900 feet north from opening)	.....	23340	A	1	3.01	33.63	57.92	5.44	.82	.....	.....	.....	.....	1.5	7,811	14,060
Same (face of 1 butt, C flat entry, 2,400 feet N. 60° E. from opening).	.....	23341	A	1	3.32	34.27	56.54	5.87	.70	.....	.....	.....	.....	2.1	7,703	13,865
Same (face of 2 flat entry, 3,000 feet N. 70° E. from opening)	.....	23342	A	1	3.48	33.40	58.18	4.94	.66	.....	.....	.....	.....	2.2	7,797	14,035
Same (composite of samples 23338, 23339, 23340, 23341, and 23342).	.....	23343	A	1	3.24	33.33	58.40	5.03	.72	5.37	78.90	1.48	8.50	1.9	7,806	14,051
				2	.....	34.45	60.35	5.20	.74	5.18	81.54	1.53	5.81	.....	8,068	14,522
				3	.....	36.34	63.66	.....	.78	5.46	86.02	1.61	6.13	.....	8,511	15,320
Omar, 1 mile west of; No. 5 mine, Island Creek or Cedar Grove bed (face of 3 left entry, 900 feet N. 10° W. from opening).	.....	23514	A	1	2.94	35.53	56.81	4.72	.72	.....	.....	.....	.....	1.6	7,833	14,099
Same (face of main temporary tipple entry, 1,480 feet N. 80° E. from opening).	.....	23515	A	1	2.96	36.20	56.71	4.13	.91	.....	.....	.....	.....	1.6	7,864	14,155
Same (face of 5 right entry, 1,030 feet north from opening)	.....	23516	A	1	2.83	35.49	56.26	5.42	.92	.....	.....	.....	.....	1.5	7,773	13,991
Same (face of main entry, 1,200 feet N. 54° E. from opening)	.....	23517	A	1	3.58	34.54	57.72	4.16	.71	.....	.....	.....	.....	2.1	7,797	14,035
Same (face of 4 room, barrier entry, 1,100 feet N. 65° E. from opening).	.....	23518	A	1	2.09	36.30	52.69	8.92	1.02	.....	.....	.....	.....	.9	7,477	13,459
Same (composite of samples 23514, 23515, 23516, 23517, and 23518).	.....	23519	A	1	2.78	36.06	55.71	5.45	.88	5.39	78.47	1.47	8.34	1.5	7,776	13,997
				2	.....	37.09	57.30	5.61	.91	5.23	80.71	1.51	6.03	.....	7,998	14,396
				3	.....	39.29	60.71	.....	.96	5.54	85.50	1.60	6.40	.....	8,473	15,251

M'DOWELL COUNTY.																
Coalwood, 1 mile from; No. 1 mine, Pocahontas No. 4 bed (face of main air course, 450 feet northwest of shaft bottom).	.....	20300	A	1	2.16	16.46	76.81	4.57	.75	.....	.....	.....	.....	1.7	8,133	14,639
Same (face of main west entry, 700 feet west of shaft bottom)...	.....	20301	A	1	1.46	16.33	77.07	5.14	.66	.....	.....	.....	.....	1.1	8,115	14,607
Same (composite of samples 20300 and 20301).....	.....	20302	A	1	1.76	16.29	77.02	4.93	.63	4.31	85.22	1.26	3.65	1.4	8,158	14,684
				2	.....	16.58	78.40	5.02	.64	4.18	86.75	1.28	2.13	.....	8,304	14,947
				3	.....	17.46	82.54	.....	.67	4.40	91.34	1.35	2.24	.....	8,743	15,737
Same (face of main haulage entry, 750 feet from shaft bottom)...	.....	20596	A	1	1.93	16.28	76.73	5.06	.66	.....	.....	.....	.....	1.5	8,082	14,548
Same (face of 2 crosscut, main haulage entry, 600 feet from shaft bottom).	.....	20597	A	1	.65	16.96	76.62	5.77	.61	.....	.....	.....	.....	.3	8,157	14,683
Same (face of main empty haulageway, 700 feet southwest of shaft bottom).	.....	20598	A	1	1.95	16.64	75.94	5.47	.62	.....	.....	.....	.....	1.5	8,035	14,463
Same (composite of samples 20596, 20597, and 20598).....	.....	20599	A	1	1.46	16.45	76.65	5.44	.65	4.32	84.78	1.22	3.59	1.1	8,115	14,607
				2	.....	16.69	77.79	5.52	.66	4.22	86.03	1.24	2.33	.....	8,235	14,823
				3	.....	17.66	82.34	.....	.70	4.47	91.05	1.31	2.47	.....	8,716	15,689
2 miles from; Nora or No. 3 mine, Sewell bed (face of 1 right entry, No. 2 opening, 1,750 feet southeast of pit mouth).	.....	20306	A	1	2.97	18.44	75.47	3.12	.93	.....	.....	.....	.....	2.4	8,242	14,836
Same (face of 3 right entry, No. 2 opening, 1,700 feet from pit mouth).	.....	20307	A	1	3.45	18.68	75.10	2.77	.77	.....	.....	.....	.....	3.0	8,248	14,846
Same (face of main entry, No. 3 opening, 600 feet northwest of pit mouth).	.....	20308	A	1	3.06	18.86	75.45	2.63	.64	.....	.....	.....	.....	2.5	8,294	14,929
Same (face of main entry, No. 2 opening, 1,550 feet northeast of pit mouth).	.....	20309	A	1	3.06	18.91	74.52	3.51	.70	.....	.....	.....	.....	2.5	8,197	14,755
Same (face of 4 right entry, No. 2 opening, 1,500 feet from pit mouth).	.....	20310	A	1	3.24	18.48	75.75	2.53	.74	.....	.....	.....	.....	2.8	8,271	14,888
Same (composite of samples 20306, 20307, 20308, 20309, and 20310)..	.....	20311	A	1	3.13	18.67	75.38	2.82	.70	4.78	85.15	1.42	5.13	2.6	8,255	14,859
				2	.....	19.27	77.82	2.91	.72	4.57	87.90	1.47	2.43	.....	8,522	15,340
				3	.....	19.85	80.15	.....	.74	4.71	90.54	1.51	2.50	.....	8,778	15,800
2 miles from Thelma or No. 6 mine, Sewell bed (face of 1 right entry, main entry, No. 1 drift. 1,800 feet from pit mouth)..	.....	20317	A	1	3.48	18.35	75.35	2.82	.76	.....	.....	.....	.....	2.9	8,235	14,823
Same (face of 2 right entry, main entry, No. 1 drift, 2,000 feet from pit mouth).	.....	20318	A	1	3.34	18.94	74.85	2.87	.80	.....	.....	.....	.....	2.9	8,238	14,828
Same (face of main entry, 3,800 feet southeast of pit mouth)....	.....	20319	A	1	2.83	19.05	73.19	4.93	.95	.....	.....	.....	.....	2.3	8,113	14,603
Same (face of 7 right entry, main entry, 3,500 feet southeast of pit mouth).	.....	20320	A	1	2.65	18.60	73.81	4.94	1.15	.....	.....	.....	.....	2.1	8,085	14,553
Same (face of 8 left entry, main entry, 3,600 feet southeast of pit mouth).	.....	20321	A	1	3.19	18.20	74.28	4.33	.94	.....	.....	.....	.....	2.7	8,131	14,636
Same (face of 3 left entry, main entry, 3,600 feet from pit mouth)..	.....	20322	A	1	2.81	18.32	74.23	4.64	1.18	.....	.....	.....	.....	2.3	8,105	14,589
Same (face of 1 left entry, No. 1 drift, 1,000 feet from pit mouth)..	.....	20323	A	1	2.35	17.82	74.97	4.86	1.22	.....	.....	.....	.....	1.8	8,147	14,665
Same (composite of samples 20317, 20318, 20319, 20320, 20321, 20322, and 20323).	.....	20324	A	1	2.87	18.44	74.49	4.20	1.00	4.70	84.24	1.46	4.40	2.4	8,137	14,647
				2	.....	18.98	76.70	4.32	1.03	4.51	86.73	1.50	1.91	.....	8,377	15,079
				3	.....	19.84	80.16	.....	1.08	4.71	90.64	1.57	2.00	.....	8,755	15,759
Huger; Lake Superior No. 1 mine, Pocahontas No. 3 bed (face of 25 room, 1 left entry, main east entry, 2,700 feet from shaft).	.....	20348	A	1	2.54	15.98	77.31	4.17	.69	.....	.....	.....	.....	2.0	8,153	14,675
Same (face of main north entry, 2,400 feet north of shaft).....	.....	20349	A	1	3.18	15.72	76.67	4.43	.71	.....	.....	.....	.....	2.7	8,091	14,564
Same (face of 3 left entry, main east entry, 1,000 feet from main east entry, and approximately 2,000 feet northwest of shaft).	.....	20350	A	1	2.55	15.87	76.83	4.75	.71	.....	.....	.....	.....	2.1	8,080	14,544
Same (face of 2 left entry, main east entry, 2,000 feet from main east entry, and approximately 2,600 feet from shaft).	.....	20351	A	1	2.05	16.14	77.08	4.73	.83	.....	.....	.....	.....	1.6	8,113	14,603
Same (face of main east entry, 2,000 feet from shaft bottom)....	.....	20352	A	1	2.36	15.60	77.43	4.61	.65	.....	.....	.....	.....	1.9	8,117	14,611
Same (face of main south entry, 1,200 feet south of main shaft)..	.....	20353	A	1	3.23	16.16	76.08	4.53	.68	.....	.....	.....	.....	2.7	8,035	14,463

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
WEST VIRGINIA—Continued.																
M'DOWELL COUNTY—continued.																
Huger: Lake Superior No. 1 mine, Pocahontas No. 3 bed (composite of samples 20348, 20349, 20350, 20351, 20352, and 20353).	.....	20354	A	1	2.60	16.39	76.38	4.63	0.76	4.40	84.53	1.10	4.58	2.1	8,101	14,582
				2	.....	16.83	78.42	4.75	.78	4.22	86.79	1.13	2.33	.....	8,317	14,971
				3	.....	17.67	82.33	.....	.82	4.43	91.12	1.19	2.44	.....	8,732	15,718
Jenkinjones; Jenkinjones No. 6 mine, Pocahontas No. 3 bed (face of F-6 entry, F entry, 3,600 feet from pit mouth).	.....	20518	A	1	3.06	21.51	69.64	5.79	.48	.....	.....	.....	.....	2.7	7,955	14,319
Same (face of F-5 entry, F entry, 3,700 feet from pit mouth)	.....	20519	A	1	3.16	22.07	69.52	5.25	.48	.....	.....	.....	.....	2.8	7,997	14,395
Same (face of 6-1 main entry, 3,100 feet from pit mouth)	.....	20520	A	1	3.59	22.12	68.96	5.33	.46	.....	.....	.....	.....	3.2	7,935	14,283
Same (face of 6-8 main entry, 2,225 feet from pit mouth)	.....	20521	A	1	4.41	21.31	68.86	5.42	.55	.....	.....	.....	.....	4.0	7,878	14,180
Same (face of M-11 entry, main entry, 1,700 feet from pit mouth)	.....	20522	A	1	2.93	21.36	69.92	5.79	.48	.....	.....	.....	.....	2.7	7,948	14,306
Same (face of P entry, P-11 entry, 6-8 main entry, 2,400 feet from pit mouth).	.....	20523	A	1	3.23	20.81	71.30	4.66	.51	.....	.....	.....	.....	3.0	8,032	14,458
Same (composite of samples 20518, 20519, 20520, 20521, 20522, and 20523).	.....	20524	A	1	3.54	21.33	69.72	5.41	.51	4.84	82.42	1.18	5.64	3.1	7,958	14,324
				2	.....	22.11	72.28	5.61	.53	4.61	85.44	1.22	2.59	.....	8,250	14,850
				3	.....	23.42	76.58	.....	.56	4.88	90.52	1.29	2.75	.....	8,740	15,732
Near; Jenkinjones No. 7 mine, Pocahontas No. 3 bed (face of 2 right entry, 7-5 main entry, 3,300 feet from pit mouth).	.....	20507	A	1	3.44	22.18	68.32	6.06	.54	.....	.....	.....	.....	3.1	7,885	14,193
Same (face of 3 right entry, 7-5 main entry, 3,400 feet from pit mouth).	.....	20508	A	1	3.29	21.92	66.25	8.54	.91	.....	.....	.....	.....	3.0	7,669	13,804
Same (face of 7 right entry, 7-1 main entry, 3,400 feet from pit mouth).	.....	20509	A	1	3.58	22.35	69.67	4.40	.49	.....	.....	.....	.....	3.2	8,029	14,452
Same (face of 4 parallel air course, 3,500 feet from pit mouth)	.....	20510	A	1	3.18	22.21	67.81	6.80	.49	.....	.....	.....	.....	2.8	7,822	14,080
Same (face of 7-1 main entry, 4,100 feet from pit mouth)	.....	20511	A	1	3.17	21.83	68.24	6.76	.48	.....	.....	.....	.....	2.8	7,837	14,107
Same (composite of samples 20507, 20508, 20509, 20510, and 20511).	.....	20512	A	1	3.41	22.12	67.87	6.60	.58	4.80	81.31	1.06	5.65	3.0	7,857	14,143
				2	.....	22.90	70.27	6.83	.60	4.58	84.18	1.10	2.71	.....	8,134	14,641
				3	.....	24.58	75.42	.....	.64	4.92	90.35	1.18	2.91	.....	8,730	14,714
Same; Jenkinjones No. 8 mine, Pocahontas No. 3 bed (face of F entry, 8-1 main entry, 1,530 feet northeast of pit mouth).	.....	20531	A	1	2.43	22.04	69.21	6.32	.70	.....	.....	.....	.....	2.0	7,985	14,373
Same (face of H-2 entry, I entry 1,000 feet from pit mouth)	.....	20532	A	1	3.37	22.22	69.66	4.75	.56	.....	.....	.....	.....	3.0	8,030	14,454
Same (face of B entry, A entry, 8-D main entry, 1,800 feet from pit mouth).	.....	20533	A	1	4.37	21.88	69.14	4.61	.60	.....	.....	.....	.....	4.0	7,952	14,314

Same (face of B airway, A entry, 1,800 feet from pit mouth)		20534	A	1	4.37	22.03	69.33	4.27	.60					4.0	7,963	14,333
Same (face of F-2 entry, F entry, main entry, 1,600 feet from pit mouth)		20535	A	1	2.61	22.67	68.03	6.69	.55					2.3	7,905	14,229
Same (composite of samples 20531, 20532, 20533, 20534, and 20535)		20536	A	1	3.54	21.96	69.24	5.26	.59	4.88	82.54	1.13	5.60	3.1	7,954	14,317
				2		22.77	71.78	5.45	.61	4.65	85.57	1.17	2.55		8,246	14,843
				3		24.09	75.91		.65	4.92	90.50	1.24	2.69		8,721	15,698
Lex; Central West mine, Pocahontas No. 5 bed (mouth of dip entry, main entry, 500 feet in entry)		17469	B	1	1.82	19.69	71.06	7.43	.50					1.0	7,851	14,132
Same (sample from 2 left entry, main entry, 1,500 feet in on entry)		17470	B	1	2.20	20.20	69.76	7.84	.77					1.4	7,818	14,072
Same (composite of samples 17469 and 17470)		17471	B	1	2.00	19.93	70.36	7.71	.69	4.47	80.95	1.53	4.65	1.2	7,838	14,107
				2		20.34	71.79	7.87	.70	4.34	82.60	1.56	2.93		7,997	14,395
				3		22.08	77.92		.76	4.71	89.65	1.69	3.19		8,680	15,624
Twin Branch, 1 mile north of; Maher or No. 4 mine, Sewell bed (face of 10 room, 2 right heading, 8 left heading, 1 parallel heading, 3,100 feet N. 50° E. of pit mouth)		22480	A	1	2.87	19.95	73.32	3.86	.56					2.2	8,158	14,684
Same (pillar, 2 room, 10 feet inby room mouth, 2 left heading, 6 right heading, 2 parallel heading, 4,700 feet S. 80° E. of pit mouth)		22481	A	1	2.54	20.13	71.17	6.16	.91					1.9	7,978	14,360
Same (face of 1 right heading, 12 left heading, 2,900 feet N. 30° E. of pit mouth)		22482	A	1	2.97	20.21	73.40	3.42	.71					2.4	8,178	14,720
Same (face of 1 right heading, 10 left heading, 2,500 feet N. 30° E. of pit mouth)		22483	A	1	2.44	20.64	72.48	4.44	.81					1.8	8,120	14,616
Same (face of main heading, 3,800 feet N. 60° E. of pit mouth)		22484	A	1	4.06	20.01	71.74	4.19	.68					3.4	8,014	14,425
Same (face of 1 parallel heading, 3,250 feet N. 45° E. of pit mouth)		22485	A	1	2.94	20.70	72.45	3.91	.56					2.4	8,149	14,668
Same (composite of samples 22480, 22481, 22482, 22483, 22484, and 22485)		22486	A	1	2.94	20.04	72.65	4.37	.70	4.68	83.30	1.36	5.59	2.3	8,098	14,576
				2		20.65	74.85	4.50	.72	4.48	85.82	1.40	3.08		8,343	15,017
				3		21.62	78.38		.75	4.69	89.86	1.47	3.23		8,736	15,725
Same (coal from various parts of mine)		22487	C	1	2.91	19.32	73.59	4.18	.67					2.3	8,122	14,620
				2		19.90	75.79	4.31	.69						8,366	15,059
				3		20.80	79.20		.72						8,742	15,736
Same (coal from various parts of mine)		22488	C	1	2.85	19.46	73.68	4.01	.64					2.2	8,143	14,657
				2		20.03	75.84	4.13	.66						8,382	15,088
				3		20.89	79.11		.69						8,743	15,737
Vivian, ½ mile west of; King No. 98 mine, Pocahontas No. 3 bed (3 room, 1 pocket, 9 east entry, 7,500 feet northeast of opening)		24799	A	1	2.02	16.64	76.48	4.86	.58					1.5	8,091	14,564
Same (face of 12 room, Scotland entry, 2,700 feet east of opening)		24800	A	1	2.09	16.88	76.59	4.44	.57					1.7	8,103	14,585
Same (composite of samples 24799 and 24800)		24801	A	1	1.98	17.17	76.19	4.66	.58	4.43	84.85	1.15	4.33	1.6	8,098	14,576
				2		17.52	77.73	4.75	.59	4.30	86.56	1.17	2.62		8,262	14,872
				3		18.39	81.61		.62	4.51	90.88	1.23	2.76		8,674	15,613
1½ miles northwest of; Carswell mine, Pocohontas No. 4 bed (right rib, crosscut, 1 right entry, 65 feet from face and 500 feet from shaft bottom)		25314	A	1	2.17	16.56	73.64	7.63	.58					1.5	7,895	14,211
Same (right rib, 1 left main entry, west entry, 100 feet from face)		25315	A	1	6.41	16.81	70.89	5.89	.63					5.8	7,672	13,810
Same (right rib, 1 right entry, 300 feet from shaft bottom)		25316	A	1	2.49	16.31	75.01	6.19	.57					1.8	7,998	14,396
Same (composite of samples 25314, 25315, and 25316)		25317	A	1	3.71	16.27	73.47	6.55	.61	4.56	81.43	1.00	5.85	3.0	7,860	14,148
				2		16.90	76.30	6.80	.63	4.31	84.57	1.04	2.65		8,163	14,693
				3		18.13	81.87		.68	4.62	90.74	1.12	2.84		8,759	15,766
Near; Norfolk No. 3 mine, Pocohontas No. 3 bed (from car shipped to Pittsburgh testing station)		25370	C	1	3.46	17.18	69.72	9.64	.44	4.33	77.72	.87	7.00	3.0	7,562	13,612
				2		17.80	72.21	9.99	.46	4.09	80.50	.90	4.06		7,833	14,099
				3		19.78	80.22		.51	4.54	89.44	1.00	4.51		8,702	15,664

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
WEST VIRGINIA—Continued.																
MARSHALL COUNTY.																
Moundsville; Mound mine, Pittsburgh bed (face of 7 west entry, 2 north entry, 1 mile north of shaft).	.....	18422	A	1	3.96	38.81	45.30	11.93	6.10	5.03	66.86	1.32	8.76	2.6	6,900	12,420
				2	.....	40.41	47.17	12.42	6.35	4.78	69.61	1.37	5.47	.....	7,184	12,931
				3	.....	46.14	53.86	.....	7.25	5.46	79.48	1.56	6.25	.....	8,203	14,765
Same	.....	18423	A	1	5.04	38.63	44.51	11.82	5.53	5.07	66.22	1.26	10.10	3.7	6,802	12,244
				2	.....	40.68	46.87	12.45	5.82	4.75	69.74	1.33	5.91	.....	7,163	12,893
				3	.....	46.46	53.54	.....	6.65	5.43	79.66	1.52	6.74	.....	8,182	14,728
MINGO COUNTY.																
Chataroy, 1 mile northeast of; Buffalo mine, Winifrede bed (1 right room, 12 drift, 500 feet from mouth of drift).	.....	17463	B	1	4.06	36.83	51.30	7.81	.80	.....	.....	.....	.....	1.8	7,308	13,154
				2	.....	38.39	53.47	8.14	.83	.....	.....	.....	.....	.....	7,617	13,711
				3	.....	41.79	58.21	.....	.90	.....	.....	.....	.....	.....	8,292	14,926
Same (3 left room, main entry, 700 feet from mouth of entry)	.....	17467	B	1	5.45	32.80	50.03	11.72	1.02	.....	.....	.....	.....	2.4	6,796	12,233
Same (composite of samples 17466 and 17467)	.....	17468	B	1	4.95	33.82	50.92	10.31	.85	5.15	71.13	1.51	11.05	2.3	6,974	12,553
				2	.....	35.58	53.57	10.85	.89	4.84	74.84	1.59	6.99	.....	7,337	13,207
				3	.....	39.91	60.09	.....	1.00	5.43	83.95	1.78	7.84	.....	8,230	14,814
Same; Thacker bed (face of prospect entry, 60 feet in)	.....	17480	B	1	4.47	38.79	50.96	5.78	2.01	.....	.....	.....	.....	2.0	7,426	13,367
				2	.....	40.61	53.34	6.05	2.10	.....	.....	.....	.....	.....	7,774	13,993
				3	.....	43.23	56.77	.....	2.24	.....	.....	.....	.....	.....	8,275	14,895
2 miles northeast of, Howard mine, Coalburg bed (1 air course, main entry, 700 feet from mine mouth).	.....	17466	B	1	4.49	35.47	51.33	8.71	.80	.....	.....	.....	.....	2.1	7,195	12,951
Matewan, 4 miles northeast of; Red Jacket, jr., mine, Red Jacket bed (15 left room, main entry, 1,200 feet from mine mouth).	.....	17474	B	1	2.14	36.01	54.31	7.54	1.65	5.00	76.45	1.58	7.78	.8	7,649	13,768
				2	.....	36.80	55.49	7.71	1.69	4.86	78.12	1.61	6.01	.....	7,817	14,071
				3	.....	39.87	60.13	.....	1.83	5.27	84.64	1.74	6.52	.....	8,470	15,246
Same; Thacker bed (15 left room, main entry, 1,200 feet from mine mouth).	.....	17483	B	1	3.02	34.66	58.92	3.40	.66	.....	.....	.....	.....	1.3	7,919	14,254
				2	.....	35.74	60.75	3.51	.68	.....	.....	.....	.....	.....	8,165	14,697
				3	.....	37.04	62.96	.....	.70	.....	.....	.....	.....	.....	8,462	15,232
Merrimac; White Star mine, Alum bed (3 left entry, main entry, 1,000 feet from mine mouth).	.....	17472	B	1	3.56	35.57	56.54	4.33	.66	5.41	79.67	1.51	8.42	1.7	7,774	13,993
				2	.....	36.88	58.63	4.49	.68	5.19	82.61	1.57	5.46	.....	8,061	14,510
				3	.....	38.61	61.39	.....	.71	5.43	86.49	1.64	5.73	.....	8,440	15,192

Same; No. 2 or Gas bed (face of main entry, 700 feet from mine mouth).	17473	B	1	3.70	33.56	59.10	3.64	.64	5.46	79.79	1.53	8.94	1.5	7,782	14,008
			2	.....	34.85	61.37	3.78	.66	5.24	82.85	1.59	5.88	.....	8,081	14,546
			3	.....	36.22	63.78	.....	.69	5.45	86.11	1.65	6.10	.....	8,399	15,118
War Eagle; 3 miles northeast of, Mephisto mine, War Eagle No. 1 bed (face of 2 left air course, 500 feet from mine mouth).	17478	B	1	3.35	30.91	58.87	6.87	1.11	.....	.....	.....	.....	1.9	7,682	13,828
2 miles east of; Papoose mine, War Eagle No. 1 bed (5 left entry, main straight entry, 600 feet from mine mouth).	17476	B	1	2.84	31.50	61.12	4.54	1.39	.....	.....	.....	.....	1.4	7,905	14,229
Same (face of 5 drift, 1,200 feet from mine mouth)	17477	B	1	3.29	31.01	60.35	5.35	1.14	.....	.....	.....	.....	1.9	7,765	13,977
3½ miles northeast of, War Eagle mine, War Eagle No. 2 bed (1 right room, main entry, 200 feet from mine mouth).	17475	B	1	2.40	32.81	60.49	4.30	.74	5.06	79.82	1.53	8.55	.8	7,953	14,315
			2	.....	33.62	61.97	4.41	.76	4.91	81.78	1.57	6.57	.....	8,149	14,668
			3	.....	35.17	64.83	.....	.80	5.14	85.55	1.64	6.87	.....	8,525	15,345
Same (composite of samples 17476, 17477, and 17478)	17479	B	1	3.15	31.40	59.85	5.60	1.18	5.12	79.51	1.60	6.99	1.7	7,807	14,053
			2	.....	32.42	61.80	5.78	1.22	4.93	82.09	1.65	4.33	.....	8,061	14,510
			3	.....	34.41	65.59	.....	1.29	5.23	87.12	1.75	4.61	.....	8,555	15,399
Williamson; 1 mile east of, Winifrede mine, Winifrede bed (700 feet northeast of mouth of main entry).	17462	B	1	3.95	37.32	53.82	4.91	.68	.....	.....	.....	.....	1.8	7,612	13,702
Same; Thacker bed (from fresh face in new prospect drift, 60 feet from mine mouth).	17481	B	1	5.72	37.00	49.47	7.81	1.87	.....	.....	.....	.....	2.8	7,098	12,776
			2	.....	39.25	52.47	8.28	1.98	.....	.....	.....	.....	.....	7,529	13,552
			3	.....	42.79	57.21	.....	2.16	.....	.....	.....	.....	.....	8,209	14,776
1½ miles northeast of, Sternberger mine, Winifrede bed (2 room, left entry, shop entry, 900 feet from mine mouth).	17464	B	1	4.70	36.24	51.34	7.72	.65	.....	.....	.....	.....	2.3	7,259	13,066
Same; Sternberger and Buffalo mines (composite of samples 17462, 17463, and 17464).	17465	B	1	4.22	37.25	51.72	6.81	.73	5.22	75.47	1.55	10.22	2.0	7,396	13,313
			2	.....	38.89	54.00	7.11	.76	4.96	78.80	1.62	6.75	.....	7,722	13,900
			3	.....	41.87	58.13	.....	.82	5.34	84.83	1.74	7.27	.....	8,313	14,963
NICHOLAS COUNTY.															
Kirkwood, 16 miles southwest of Camden; local mine (60 feet S. 7° E. of mine mouth at face of entry).	21819	B	1	5.72	32.84	56.58	4.86	1.42	5.77	76.08	1.60	10.27	4.5	7,564	13,615
			2	.....	34.83	60.01	5.16	1.51	5.44	80.70	1.70	5.49	.....	8,023	14,441
			3	.....	36.72	63.28	.....	1.59	5.74	85.09	1.79	5.79	.....	8,459	15,229
Muddlety; local mine, No. 1 or Eagle bed (face of entry, about 200 feet S. 50° E. of opening).	21820	B	1	4.54	33.66	56.69	5.11	.93	5.87	76.18	1.62	10.29	3.2	7,675	13,815
			2	.....	35.26	59.39	5.35	.97	5.63	79.81	1.70	6.54	.....	8,040	14,472
			3	.....	37.25	62.75	.....	1.02	5.95	84.32	1.80	6.91	.....	8,494	15,289
PUTNAM COUNTY.															
Black Betsey, 2 miles northeast of; Black Betsey, No. 3 Mine, Pittsburgh or No. 8 bed (face of 11 left heading, 3,600 feet S. 10° E. from opening).	23641	A	1	4.82	39.69	48.26	7.23	1.94	.....	.....	.....	.....	2.2	7,226	13,007
Same (face of 7 right heading, 2,500 feet S. 20° E. from opening)	23642	A	1	5.68	88.64	59.42	6.26	1.49	.....	.....	.....	.....	2.9	7,234	13,021
Same (face of 6, left heading, 3,350 feet S. 35° E. from opening)	23643	A	1	4.79	40.98	46.94	7.29	2.30	.....	.....	.....	.....	2.5	7,242	13,036
Same (face of 5 room, 3 left heading, 3,075 feet S. 45° E. from opening).	23644	A	1	4.76	40.05	48.21	6.98	1.53	.....	.....	.....	.....	2.3	7,264	13,075
Same (face of 1 left heading, 3,050 feet S. 60° E. from opening)	23645	A	1	5.23	39.54	48.51	6.72	1.26	.....	.....	.....	.....	2.6	7,246	13,043
Same (face of 24 room, main south heading, 3,250 feet S. 70° E. from opening).	23646	A	1	4.83	40.24	47.32	7.61	2.52	.....	.....	.....	.....	2.5	7,191	12,944
Same (composite of samples 23641, 23642, 23643, 23644, 23645, and 23646).	23647	A	1	4.98	39.63	48.34	7.05	1.82	5.58	72.40	1.33	11.82	2.5	7,222	13,000
			2	.....	41.71	50.87	7.42	1.92	5.29	76.19	1.40	7.78	.....	7,600	13,680
			3	.....	45.05	54.95	.....	2.07	5.71	82.29	1.51	8.42	.....	8,209	14,776
RALEIGH COUNTY.															
Eccles; Eccles No. 5 mine, Beckley bed (face of 12 room, 1 right entry, main east entry, near coal barrier).	19774	A	1	1.63	18.76	74.67	4.94	.80	.....	.....	.....	.....	.8	8,105	14,588
Same (face of 4 room, 3 left entry, main west entry)	19775	A	1	1.59	19.00	73.61	5.80	.65	.....	.....	.....	.....	.8	8,031	14,456
Same (face of 14 room, 1 left entry, main east entry)	19776	A	1	1.69	18.13	72.12	8.06	.67	.....	.....	.....	.....	.8	7,823	14,081

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
WEST VIRGINIA—Continued.																
RALEIGH COUNTY—continued.																
Eccles, Eccles No. 5 mine, Beckley bed (face of 25 room, main south air course).	.....	19777	A	1	1.93	17.97	74.38	5.72	1.09	.....	.....	.....	.....	1.0	8,000	14,400
Same (face of 12 room, 2 right entry, main west entry)	.....	19778	A	1	1.68	18.61	72.55	7.16	.64	.....	.....	.....	.....	.9	7,899	14,218
Same (composite of samples 19774, 19775, 19776, 19777, and 19778).	.....	19779	A	1	1.82	18.39	72.32	6.47	.79	4.41	82.67	1.47	4.19	.9	7,982	14,368
				2	.....	18.73	74.68	6.59	.80	4.29	84.20	1.50	2.62	.....	8,130	14,634
				3	.....	20.05	79.95	.....	.86	4.59	90.14	1.61	2.80	.....	8,703	15,565
WYOMING.																
CAMPBELL COUNTY.																
Gillette, about 40 miles southwest of; sec. 74, T. 46 N., R. 74 W.; country bank.	.....	*22973	B	1	30.98	30.53	28.37	10.12	1.42	.....	.....	.....	.....	21.7	4,022	7,240
				2	.....	44.23	41.11	14.66	2.06	.....	.....	.....	.....	.....	5,827	10,490
				3	.....	51.83	48.17	.....	2.41	.....	.....	.....	.....	.....	6,828	12,292
40 miles south of; T. 45 N., R. 73 W.; "B" bed, local mine	.....	*22885	B	1	29.01	32.03	31.13	7.83	1.39	6.61	46.64	.86	36.67	20.3	4,564	8,215
				2	.....	45.11	43.86	11.03	1.96	4.78	65.70	1.21	15.32	.....	6,429	11,572
				3	.....	50.70	49.30	.....	2.20	5.37	73.85	1.36	17.22	.....	7,226	13,007
45 miles south of; T. 44 N., R. 73 W.; prospect, "A"(?) bed	.....	*22904	B	1	33.53	30.54	29.74	6.19	1.17	.....	.....	.....	.....	25.3	4,082	7,348
				2	.....	45.94	44.75	9.31	1.76	.....	.....	.....	.....	.....	6,141	11,054
				3	.....	50.66	49.34	.....	1.94	.....	.....	.....	.....	.....	6,772	12,189
CARBON COUNTY.																
Hanna, 20 miles northwest of; sec. 11, T. 24 N., R. 83 W.; local mine (210 feet N. 12° W. from opening).	.....	*22972	B	1	14.13	32.81	48.61	4.45	1.03	.....	.....	.....	.....	7.2	5,927	10,669
				2	.....	38.21	56.60	5.18	1.20	.....	.....	.....	.....	.....	6,903	12,425
				3	.....	40.30	59.69	.....	1.27	.....	.....	.....	.....	.....	7,280	13,103
Medicine Bow, 18 miles southwest of; sec. 5, T. 20 N., R. 79 W.; Johnson mine (face of south entry, 85 feet from opening).	.....	22800	B	1	13.29	37.89	41.96	6.86	.85	.....	.....	.....	.....	2.7	6,004	10,807
				2	.....	43.70	48.39	7.91	.98	.....	.....	.....	.....	.....	6,924	12,463
				3	.....	47.45	52.55	.....	1.06	.....	.....	.....	.....	.....	7,519	13,534
Rock River, 14 miles southwest of; sec. 7, T. 19 N., R. 77 W.; King mine (25 feet from mine mouth).	.....	*22792	B	1	25.99	32.42	34.49	7.10	.98	.....	.....	.....	.....	13.3	4,939	8,890
				2	.....	43.81	46.60	9.59	1.32	.....	.....	.....	.....	.....	6,674	12,013
				3	.....	48.46	51.54	.....	1.46	.....	.....	.....	.....	.....	7,382	13,288

CONVERSE COUNTY.																
Big Muddy; SE. ¼ sec. 26, T. 34 N., R. 77 W.; Big Muddy mine, upper Big Muddy bed (300 feet down slope).	.....	*17722	B	1	25.09	31.98	38.16	4.77	.73	6.31	52.81	1.16	34.22	5.6	4,981	8,966
				2	.....	42.69	50.94	6.37	.97	4.70	70.50	1.55	15.91	.....	6,649	11,968
				3	.....	45.59	54.41	.....	1.04	5.02	75.29	1.66	16.99	.....	7,101	12,782
Same; Lower Big Muddy bed (40 feet from mouth of unused slope in NW. ¼ sec. 36).	.....	*17723	B	1	23.48	34.33	35.19	7.00	.59	5.85	51.19	.99	34.38	5.5	4,753	8,555
				2	.....	44.86	45.99	9.15	.77	4.23	66.90	1.29	17.66	.....	6,211	11,180
				3	.....	49.38	50.62	.....	.85	4.66	73.64	1.42	19.43	.....	6,836	12,305
Glenrock; NE. ¼ sec. 5, T. 33 N., R. 75 W.; Fairview mine (200 feet northeast of shaft).	.....	*17657	B	1	22.76	34.67	37.05	5.52	.71	6.07	54.68	1.02	32.00	7.0	5,150	9,270
				2	.....	44.89	47.96	7.15	.92	4.58	70.79	1.32	15.24	.....	6,668	12,002
				3	.....	48.35	51.65	.....	.99	4.93	76.24	1.42	16.42	.....	7,181	12,926
¼ mile east of; NE. ¼ SW. ¼ sec. 4, T. 33 N., R. 75 W.; Glenrock mine (75 feet N. 34° E. of main opening).	.....	*17658	B	1	21.08	31.51	41.26	6.15	.73	.....	.....	.....	.....	5.5	5,105	9,189
				2	.....	39.93	52.28	7.79	.92	.....	.....	.....	.....	.....	6,469	11,644
				3	.....	43.30	56.70	.....	1.00	.....	.....	.....	.....	.....	7,016	12,629
2 miles south of; SE. ¼ sec. 9, T. 33 N., R. 75 W.; prospect (40 feet from slope mouth).	.....	*17902	B	1	27.17	29.74	36.09	7.00	.40	.....	.....	.....	.....	14.1	4,275	7,695
				2	.....	40.84	49.55	9.61	.55	.....	.....	.....	.....	.....	5,870	10,566
				3	.....	45.18	54.82	.....	.61	.....	.....	.....	.....	.....	6,494	11,689
FREMONT COUNTY.																
Dubois, 8 miles northeast of; sec. 25, T. 42 N., R. 108 W.; prospect (10 feet from opening).	.....	17584	B	1	13.15	38.82	34.27	13.76	3.47	.....	.....	.....	.....	2.1	5,444	9,799
				2	.....	44.70	39.46	15.84	4.00	.....	.....	.....	.....	.....	6,268	11,282
				3	.....	53.11	46.89	.....	4.75	.....	.....	.....	.....	.....	7,448	13,406
Hudson, 2 miles northeast of; sec. 2, T. 2 S., R. 2 E.; McKinley mine, "Mesa Verde" bed (face of 3 room, 75 feet from slope).	.....	*21408	A	1	20.95	33.68	38.38	6.99	1.28	.....	.....	.....	.....	14.5	5,240	9,432
Same (500 feet from pit mouth)	.....	*21409	A	1	19.88	33.27	37.66	9.19	.95	.....	.....	.....	.....	12.5	5,210	9,378
Same (face of 1 room, 50 feet from entry)	.....	*21410	A	1	21.52	34.30	37.88	6.30	1.24	.....	.....	.....	.....	15.4	5,273	9,491
Same (composite of samples 21408, 21409, and 21410)	.....	*21411	A	1	20.72	33.89	37.81	7.58	1.20	6.16	53.93	1.17	29.96	14.1	5,234	9,421
				2	.....	42.75	47.69	9.56	1.51	4.87	68.03	1.48	14.55	.....	6,602	11,884
				3	.....	47.27	52.73	.....	1.67	5.38	75.22	1.64	16.09	.....	7,300	13,140
HOT SPRINGS COUNTY.																
Kirby, 2½ miles from; S. ½ sec. 11, T. 44 N., R. 95 W.; Gebo mine, Gebo bed (face of 3 east back entry, 325 feet east of 5 dip butt, 2 east entry).	.....	*24447	A	1	16.65	34.17	45.83	3.35	.52	.....	.....	.....	.....	10.7	6,106	10,991
Same (face of 6 butt, 12 feet south of 2 east entry near west rib, 3,600 feet from mouth).	.....	*24448	A	1	17.54	33.26	44.76	4.44	.75	.....	.....	.....	.....	11.2	5,941	10,694
Same (5 feet back of face of 4 west main entry, about 275 feet west of 2 butt, 3,000 feet from opening).	.....	*24449	A	1	15.92	33.04	46.59	4.45	.54	.....	.....	.....	.....	10.9	6,064	10,915
Same (face of 3 west main entry, 3,200 feet from opening)	.....	*24450	A	1	16.60	33.37	46.48	3.55	.52	.....	.....	.....	.....	11.1	6,069	10,924
Same (12 feet south of 2 east entry, near east rib at face of 6 butt, about 3,600 feet from opening).	.....	*24451	A	1	17.64	33.75	44.19	4.42	.76	.....	.....	.....	.....	12.2	5,910	10,638
Same (composite of samples 24447, 24448, 24449, 24450, and 24451).	.....	*24452	A	1	16.94	33.06	45.96	4.04	.62	6.07	61.44	1.30	26.53	11.2	5,998	10,796
				2	.....	39.80	55.34	4.86	.75	5.04	73.97	1.57	13.81	.....	7,221	12,998
				3	.....	41.83	58.17	.....	.79	5.30	77.75	1.65	14.51	.....	7,590	13,662
34 miles northwest of; sec. 1, T. 45 N., R. 99 W.; Gwynn prospect, "B" bed (face of room, 30 feet west of a point 40 feet south of entrance).	.....	17830	B	1	11.52	34.25	39.98	14.25	.45	.....	.....	.....	.....	2.2	5,547	9,985
				2	.....	38.71	45.18	16.11	.51	.....	.....	.....	.....	.....	6,269	11,284
				3	.....	46.14	53.86	.....	.61	.....	.....	.....	.....	.....	7,473	13,451
Thermopolis, 36 miles northwest of; SE. ¼ sec. 29, T. 44 N., R. 98 W.; Berry Brothers prospect (south rib of main entry, 40 feet from mouth).	.....	17731	B	1	25.14	33.12	36.00	5.74	.98	.....	.....	.....	.....	11.6	4,179	7,522
				2	.....	44.24	48.09	7.67	1.31	.....	.....	.....	.....	.....	5,582	10,048
				3	.....	47.92	52.08	.....	1.42	.....	.....	.....	.....	.....	6,046	10,883
42 miles northwest of; SE. ¼ sec. 24, T. 44 N., R. 99 W.; Putney mine, Putney bed (face of room 70 feet S. 65° W. of point in main entry 80 feet from mouth).	.....	17709	B	1	13.65	35.84	41.73	8.78	.60	.....	.....	.....	.....	2.0	5,801	10,442
				2	.....	41.51	48.32	10.17	.69	.....	.....	.....	.....	.....	6,718	12,092
				3	.....	46.21	53.79	.....	.77	.....	.....	.....	.....	.....	7,478	13,460

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
WYOMING—Continued.																
LINCOLN COUNTY.																
Kemmerer, 7 miles north of; Kemmerer No. 6 mine (lower rib, 15 feet from face of 3 south entry).	.....	18608	A	1	3.89	40.52	48.69	6.90	0.62	.....	.....	.....	.....	1.7	7,154	12,877
Same (upper rib, 10 feet from face of 2 south entry)	.....	18609	A	1	4.26	40.32	49.22	6.20	.47	.....	.....	.....	.....	2.1	7,196	12,953
Same (upper rib, 10 feet from face of 2 north entry)	.....	18610	A	1	3.82	40.37	48.69	7.12	.70	.....	.....	.....	.....	1.7	7,176	12,917
Same (upper rib, 5 feet at face of 3 north entry)	.....	18611	A	1	3.82	39.98	48.63	7.57	.69	.....	.....	.....	.....	1.7	7,107	12,793
Same (composite of samples 18608, 18609, 18610, and 18611)	.....	18612	A	1	3.94	40.09	49.00	6.97	.60	5.49	72.19	1.22	13.53	1.8	7,159	12,886
				2	.....	41.73	51.01	7.26	.62	5.26	75.15	1.27	10.44	.....	7,453	13,415
				3	.....	45.00	55.00	.....	.67	5.67	81.03	1.37	11.26	.....	8,037	14,467
Same (upper rib, 3 north entry, 5 feet from face)	.....	18783	A	1	3.92	40.34	48.34	7.40	.72	5.50	71.87	1.31	13.20	1.8	7,131	12,836
				2	.....	41.99	50.31	7.70	.75	5.27	74.80	1.36	10.12	.....	7,422	13,360
				3	.....	45.49	54.51	.....	.81	5.71	81.04	1.47	10.97	.....	8,041	14,474
NATRONA COUNTY.																
Casper, 7 miles southeast of; SE. ¼ sec. 22, T. 33 N., R. 78 W.; Casper prospect (40 feet from mouth of prospect, on fresh face).	.....	*17778	B	1	24.14	33.62	36.79	5.45	.70	.....	.....	.....	.....	6.1	4,840	8,712
				2	.....	44.32	48.50	7.18	.92	.....	.....	.....	.....	.....	6,380	11,484
				3	.....	47.75	52.25	.....	.99	.....	.....	.....	.....	.....	6,874	12,373
5 miles north of; SW. ¼ sec. 13, T. 36 N., R. 79 W.; prospect (20 feet from mouth of prospect).	.....	*17895	B	1	24.90	30.69	39.31	5.10	.40	.....	.....	.....	.....	10.0	4,832	8,698
				2	.....	40.87	52.34	6.79	.53	.....	.....	.....	.....	.....	6,434	11,581
				3	.....	43.85	56.15	.....	.57	.....	.....	.....	.....	.....	6,902	12,424
SHERIDAN COUNTY.																
Acme; Acme No. 1 mine, Carney bed (rib in 5 room, 2 north entry, 5 west entry, 1,600 feet northwest of pit mouth).	.....	*25199	A	1	23.50	32.42	40.71	3.37	.40	.....	.....	.....	.....	14.6	5,209	9,376
Same (face of 8 south entry, 8 west entry, 3,800 feet from pit mouth).	.....	*25217	A	1	25.31	32.62	39.28	2.79	.36	.....	.....	.....	.....	12.9	5,128	9,230
Same (face of 2 room, 4 north entry, 5 west entry, 1,500 feet from pit mouth).	.....	*25218	A	1	23.55	32.51	40.94	3.00	.35	.....	.....	.....	.....	11.8	5,258	9,464
Same (face of 1 room, 1 north entry, 4 east entry, 1,000 feet from pit mouth).	.....	*25219	A	1	23.58	32.23	40.64	3.55	.43	.....	.....	.....	.....	11.3	5,217	9,391

Same (face of 10 room, 4 east entry, 1,200 feet from pit mouth)		*25220	A	1	23.63	32.59	39.97	3.81	.62					12.0	5,276	9,497
Same (face of 2 room, 6 north entry, 8 west entry, 4,000 feet from pit mouth).		*25221	A	1	23.60	32.56	40.10	3.74	.52					12.7	5,225	9,405
Same (face of 3 room, 4 south entry, 8 west entry, 3,000 feet from pit mouth).		*25222	A	1	24.88	32.02	39.75	3.35	.43					14 2	5,142	9,256
Same (face of 10 room, 4 north entry, 5 west entry, 1,800 feet from pit mouth).		*25223	A	1	23.77	32.24	40.58	3.41	.38					12.6	5,237	9,427
Same (rib of 8 west entry, main entry, 2,500 feet from pit mouth)		*25255	A	1	22.79	32.49	41.01	3.71	.26					8.4	5,225	9,405
Same (rib on main slope, 1,700 feet from pit mouth)		*25256	A	1	22.42	33.00	41.33	3.25	.27					8.4	5,295	9,531
Same (rib on main entry, 2,000 feet from pit mouth)		*25257	A	1	22.90	33.16	40.59	3.35	.30					8.2	5,271	9,488
Same (rib 500 feet in 8 west entry, 3,000 feet from pit mouth)		*25258	A	1	25.41	31.20	40.05	3.34	.34					13.2	5,071	9,128
Same (composite of samples 25199, 25217, 25218, 25219, 25220, 25221, 25222, 25223, 25255, 25256, 25257, and 25258).		*25224	A	1	23.82	32.40	40.47	3.31	.38	6.50	55.26	.89	33.66	11.7	5,213	9,383
				2	.....	42.53	53.12	4.35	.50	5.05	72.54	1.17	16.39	.....	6,843	12,317
				3	.....	44.47	55.53	.....	.52	5.28	75.84	1.22	17.14	.....	7,154	12,877
Carneyville: Carney No. 1 mine, Carney bed (face of 1 room, 1 north entry, 2 east entry, 1,900 feet from pit mouth).		*25198	A	1	25.33	30.74	40.27	3.66	.42	6.33	53.47	1.12	35.00	16.5	5,059	9,106
				2	.....	41.17	53.93	4.90	.56	4.71	71.61	1.50	16.72	.....	6,775	12,195
				3	.....	43.29	56.71	.....	.59	4.95	75.30	1.58	17.58	.....	7,124	12,823
Same (face of right main parallel entry, 5,300 feet from pit mouth).		*25295	A	1	25.11	31.17	40.30	3.42	.33					13.4	5,102	9,184
Same (face of 14 room, 1 north entry, 4 west entry, 2,500 feet from pit mouth).		*25296	A	1	24.79	31.67	39.76	3.78	.40					10.0	5,116	9,209
Same (face of 15 room, 2 north entry, 2 east entry, 1,800 feet from pit mouth).		*25297	A	1	25.81	29.46	41.94	2.79	.27					9.9	5,096	9,173
Same (face of 1 room, 4 north entry, 4 west entry, 3,000 feet from pit mouth).		*25298	A	1	23.90	30.96	41.27	3.87	.33					7.8	5,171	9,308
Same (rib of 3 west entry, 25 feet inby 6 north entry, 2,400 feet from pit mouth).		*25304	A	1	25.65	29.84	41.92	2.59	.29					14.4	5,002	9,004
Same (rib of main entry, 25 feet outby 1 east entry, 1,000 feet from pit mouth).		*25305	A	1	22.11	31.23	43.73	2.93	.30					11.1	5,157	9,283
Same (rib of main entry, 600 feet from pit mouth)		*25306	A	1	22.85	30.72	43.33	3.10	.34					11.5	5,084	9,151
Same (rib of 3 west entry, 25 feet inby 4 north entry, 1,900 feet from pit mouth).		*25307	A	1	25.37	29.47	41.92	3.24	.32					9.9	5,016	9,029
Same (composite of samples 25295, 25296, 25297, 25298, 25304, 25305, 25306, and 25307).		*25299	A	1	24.47	30.36	41.94	3.23	.31	6.20	53.71	.98	35.57	11.0	5,087	9,157
				2	.....	40.20	55.52	4.28	.41	4.61	71.11	1.30	18.29	.....	6,735	12,123
				3	.....	42.00	58.00	.....	.43	4.82	74.29	1.36	19.10	.....	7,036	12,665
Near; Carney No. 2 mine, Carney bed (rib, 50 feet in, in entry stump, 2 east entry, 900 feet from opening).		*25197	A	1	25.84	29.76	41.21	3.19	.28	6.33	53.41	1.08	35.71	16.0	4,981	8,966
				2	.....	40.13	55.57	4.30	.38	4.67	72.02	1.46	17.17	.....	6,716	12,089
				3	.....	41.93	58.07	.....	.40	4.88	75.25	1.53	17.94	.....	7,018	12,632
Near; Model mine, Carney bed (face of 14 room, 1 west entry, 900 feet northwest of shaft).		*25187	A	1	27.21	29.66	38.09	5.04	.31					17.4	4,792	8,626
Same (face of 3 room, 2 west entry, 500 feet southwest of shaft)		*25188	A	1	25.51	29.61	35.34	9.54	.38					15.4	4,624	8,323
Same (face of north entry, 700 feet from shaft)		*25226	A	1	26.20	30.62	38.94	4.24	.30					11.8	5,008	9,014
Same (face of 1 east entry, 200 feet from shaft)		*25227	A	1	25.17	29.07	37.11	8.65	.34					11.7	4,735	8,523
Same (composite of samples 25187, 25188, 25226, and 25227)		*25189	A	1	25.90	29.39	37.77	6.94	.33	6.22	50.99	1.02	34.50	14.1	4,784	8,611
				2	.....	39.66	50.97	9.37	.45	4.51	68.81	1.38	15.48	.....	6,456	11,621
				3	.....	43.76	56.24	.....	.50	4.98	75.92	1.52	17.08	.....	7,124	12,823
Dietz; Dietz No. 7 mine, Dietz No. 7 bed (face of 2 room, 5 west entry, 1,800 feet from pit mouth).		*25200	A	1	24.10	31.29	38.55	6.06	.56					14.6	4,899	8,818
Same (face of 11 room, 2 east entry, 1,700 feet from pit mouth)		*25202	A	1	24.49	30.07	39.12	6.32	.61					15.2	4,850	8,730
Same (face of 9 room, 1 east entry, 1,800 feet from pit mouth)		*25289	A	1	23.82	30.33	40.02	5.83	.56					10.3	4,995	8,991
Same (face of 15 room, 1 west entry, 1,600 feet from pit mouth)		*25290	A	1	24.39	31.78	39.69	4.14	.58					11.0	5,122	9,220
Same (face of main north entry, 2,600 feet from pit mouth)		*25291	A	1	25.72	29.98	39.57	4.73	.44					14.6	4,924	8,863
Same (face of 15 room, 2 east entry, 1,900 feet from pit mouth		*25292	A	1	24.35	30.76	40.86	4.03	.47					13.0	5,081	9,146

Table of chemical analyses—Continued.

Locality, bed, etc.	Mine notes (page).	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.	
		Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
WYOMING—Continued.																
SHERIDAN COUNTY—continued.																
Dietz; Dietz No. 7 mine, Dietz No. 7 bed (face of 13 room, 6 west entry, 1,900 feet from pit mouth).	.....	*25293	A	1	23.65	32.01	40.83	3.51	0.31	.....	.....	.....	.....	10.0	5,187	9,337
Same (face of 5 room, 2 west entry, 1,300 feet from pit mouth)..	.....	*25294	A	1	24.56	31.25	40.16	4.03	.34	.....	.....	.....	.....	11.9	5,076	9,137
Same (composite of samples 25200, 25202, 25289, 25290, 25291, 25292, 25293, and 25294).	.....	*25203	A	1	24.36	31.14	39.74	4.76	.48	6.34	52.59	1.05	34.78	12.6	4,997	8,995
				2	.....	41.17	52.54	6.29	.63	4.80	69.53	1.39	17.36	.....	6,607	11,893
				3	.....	43.93	56.07	.....	.67	5.12	74.20	1.48	18.53	.....	7,050	12,690
Kooi; sec. 23, T. 57, R. 85 W.; Kooi mine, Monarch bed (face of 14 room, 7 panel, 5 east entry, 2,000 feet from pit mouth).	.....	*25263	A	1	24.64	32.80	37.98	4.58	.61	.....	.....	.....	.....	11.0	4,995	8,991
Same (face of 29 room, 5 panel, 5 east entry, 1,800 feet from pit mouth).	.....	*25264	A	1	24.74	32.27	37.77	5.22	.83	.....	.....	.....	.....	10.7	4,970	8,946
Same (face of 3 panel, 12 entry, 2,800 feet from pit mouth).....	.....	*25265	A	1	22.34	33.80	37.93	5.93	.81	.....	.....	.....	.....	7.3	5,131	9,236
Same (face of 1 room, 6 panel, 10 east entry, 2,600 feet from pit mouth).	.....	*25266	A	1	23.25	35.33	36.14	5.28	.72	.....	.....	.....	.....	6.3	5,142	9,256
Same (face of 3 panel, 11 east entry, 2,600 feet from pit mouth)..	.....	*25267	A	1	23.91	32.56	39.04	4.49	.53	.....	.....	.....	.....	10.2	5,104	9,187
Same (face of 11 east entry, 2,800 feet from pit mouth).....	.....	*25268	A	1	22.99	34.46	37.27	5.28	.83	.....	.....	.....	.....	7.3	5,112	9,202
Same (face of 13 room, 5 panel, 10 east entry, 2,500 feet from pit mouth).	.....	*25269	A	1	22.51	34.55	37.92	5.02	.47	.....	.....	.....	.....	7.0	5,190	9,342
Same (face of 7 room, 5 panel, 10 east entry, 2,400 feet from pit mouth).	.....	*25270	A	1	23.82	33.72	37.97	4.49	.62	.....	.....	.....	.....	7.5	5,122	9,220
Same (face of 8 room, 8 panel, 9 east entry, 2,400 feet from pit mouth).	.....	*25271	A	1	24.68	33.18	38.26	3.88	.40	.....	.....	.....	.....	7.6	5,114	9,205
Same (face of 5 room, 6½ panel, 9 east entry, 2,300 feet from pit mouth).	.....	*25272	A	1	23.81	33.88	38.12	4.19	.63	.....	.....	.....	.....	6.8	5,170	9,306
Same (face of 14 room, 6 panel, 10 east entry, 2,400 feet from pit mouth).	.....	*25273	A	1	23.44	33.89	37.58	5.09	.80	.....	.....	.....	.....	7.5	5,127	9,229
Same (composite of samples 25263, 25264, 25265, 25266, 25267, 25268, 25269, 25270, 25271, 25272, and 25273).	.....	*25274	A	1	23.66	32.58	38.86	4.90	.67	6.45	53.94	1.09	32.95	8.1	5,097	9,175
				2	.....	42.68	50.90	6.42	.88	5.00	70.66	1.43	15.61	.....	6,677	12,019
				3	.....	45.61	54.39	.....	.94	5.34	75.51	1.53	16.68	.....	7,135	12,843
Monarch; SE. ¼ sec. 24, T. 57 N., R. 85 W.; Monarch mine, Monarch bed (face of 8 east entry).	.....	*19006	A	1	22.51	34.34	38.90	4.25	.68	.....	.....	.....	.....	12.8	5,330	9,594

Same (face of 5 east entry)	.....	*19007	A	1	24.20	33.46	38.54	3.80	.44	.....	.....	.....	.....	14.6	5,187	9,337
Same (face of 5 west entry, 2,000 feet from opening in heart of property).	.....	*19008	A	1	22.95	33.98	39.40	3.67	.39	.....	.....	.....	.....	12.6	5,307	9,553
Same (composite of samples 19006, 19007, and 19008)	.....	*19009	A	1	23.33	33.87	38.92	3.88	.52	6.45	54.82	1.18	33.15	13.4	5,273	9,491
				2	.....	44.18	50.76	5.06	.68	5.03	71.50	1.54	16.19	.....	6,878	12,380
				3	.....	46.53	53.47	.....	.72	5.30	75.31	1.62	17.05	.....	7,245	13,041
Same (face of 5 west entry, 2,000 feet from opening)	.....	*19054	A	1	23.14	34.57	38.69	3.60	.42	6.46	55.09	1.14	33.29	12.3	5,303	9,545
				2	.....	44.98	50.34	4.68	.55	5.06	71.68	1.48	16.55	.....	6,900	12,420
				3	.....	47.19	52.81	.....	.58	5.31	75.20	1.55	17.36	.....	7,239	13,030
Same (rib 50 feet in 4 room, 3 west entry, 1,500 feet from opening)	.....	*25190	A	1	23.24	33.01	40.27	3.48	.39	.....	.....	.....	.....	11.3	5,234	9,421
Same (rib 50 feet in 24 room, 2 butt entry, 6 west entry, 1,600 feet from opening).	.....	*25191	A	1	21.42	34.09	40.56	3.92	.46	.....	.....	.....	.....	9.9	5,379	9,682
Same (face of 6 room, 3 west entry, 1,600 feet from opening)	.....	*25244	A	1	24.21	32.54	39.90	3.35	.37	.....	.....	.....	.....	9.0	5,204	9,367
Same (face of 10 room, 4 butt entry, 6 west entry, 2,000 feet from opening).	.....	*25245	A	1	24.51	33.27	38.46	3.76	.54	.....	.....	.....	.....	8.4	5,160	9,288
Same (face of 18 room, 6 butt entry, 5 west entry, 2,200 feet from opening).	.....	*25246	A	1	24.91	33.14	38.10	3.85	.30	.....	.....	.....	.....	9.4	5,105	9,189
Same (face of 8 room, 8 butt entry, 6 west entry, 2,420 feet from opening).	.....	*25247	A	1	22.78	33.57	39.74	3.91	.62	.....	.....	.....	.....	8.1	5,270	9,486
Same (face of 11 room, 10 butt entry, 5 west entry, 2,500 feet from opening).	.....	*25248	A	1	25.01	32.13	39.05	3.81	.57	.....	.....	.....	.....	11.4	5,099	9,178
Same (face of new 8 west entry, 1,000 feet from opening)	.....	*25249	A	1	23.76	32.41	40.24	3.59	.44	.....	.....	.....	.....	10.3	5,233	9,419
Same (face of 16 room, 7 east entry, 2,300 feet from opening)	.....	*25250	A	1	23.34	33.65	39.39	3.62	.33	.....	.....	.....	.....	9.5	5,242	9,436
Same (rib, 175 feet outby 9 west entry, in main haulageway, 800 feet from opening).	.....	*25252	A	1	23.03	33.10	40.00	3.87	.40	.....	.....	.....	.....	9.0	5,174	9,313
Same (rib in main haulageway, 600 feet from opening)	.....	*25253	A	1	22.57	33.72	40.12	3.59	.39	.....	.....	.....	.....	10.3	5,227	9,409
Same (rib, 1,200 feet in 9 west entry, 2,200 feet from opening)	.....	*25311	A	1	21.04	33.69	41.64	3.63	.44	.....	.....	.....	.....	8.2	5,383	9,689
Same (rib, 700 feet in 9 west entry, 1,700 feet from opening)	.....	*25312	A	1	20.92	34.03	40.79	4.26	.44	.....	.....	.....	.....	8.3	5,334	9,601
Same (rib, 2,000 feet in 9 west entry, 3,000 feet from opening)	.....	*25313	A	1	20.85	33.75	41.51	3.89	.26	.....	.....	.....	.....	8.6	5,337	9,607
Same (composite of samples 25190, 25191, 25244, 25245 25246, 25247, 25248, 25249, 25250, 25252, 25253, 25311, 25312, and 25313).	.....	*25192	A	1	23.17	33.25	39.82	3.76	.44	6.40	54.62	.96	33.82	9.4	5,231	9,416
				2	.....	43.28	51.83	4.89	.57	4.99	71.09	1.25	17.21	.....	6,809	12,256
				3	.....	45.50	54.50	.....	.60	5.25	74.74	1.31	18.10	.....	7.159	12,886
SWEETWATER COUNTY.																
Rock Springs, 40 miles south of; sec. 24, T. 12 N., R. 104 W.; prospect, Tipton bed.	.....	*22552	B	1	8.92	35.04	42.08	13.96	6.85	4.73	51.54	1.65	21.27	.5	5,119	9,214
				2	.....	38.47	46.20	15.33	7.52	4.11	56.59	1.81	14.64	.....	5,620	10,116
				3	.....	45.44	54.56	.....	8.88	4.85	66.84	2.14	17.29	.....	6,638	11,948

DESCRIPTION OF SAMPLES.

ALABAMA.

BIBB COUNTY.

COLEANOR. COLEANOR MINE.

Analyses 20132 to 20135, and 20142 (p. 17). Bituminous coal, Cahaba field, from Coleanor mine, a slope mine in sec. 1, T. 24 N., R. 10 E., at Coleanor, on the Louisville & Nashville and the Southern R. R. Coal bed, Thompson; Carboniferous age, Pottsville formation. Bed 3 feet 8 inches to 4 feet 11 inches thick; dips 6° to 21° almost east; contains bands of shale and "slate." Roof, shale and laminated coal bands; floor, hard sandstone. The bed was sampled by E. B. Sutton on November 6, 1914, as described below.

Sections of coal bed in Coleanor mine.

Section Laboratory No.	A 20132	B 20133	C 20134	D 20142
Roof, shale, and coal.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	[a] 11	[a] 9¾	[a] 10	[a] 10
"Rash"	[a] 1½	[a] 1	[a] 1	[a] 1½
Coal	8	6	9	6½
Shale	[a] 2	[a] 2	[a] 3	[a] 4
Coal	2 3	2 4	2 10	2 10½
Floor, sandstone.				
Thickness of bed	4 1½	3 10¾	4 9	4 8½
Thickness of coal sampled	2 11	2 10	3 7	3 5

[a] Not included in sample.

Section A (sample 20132) was cut from the face of 37 room, 10 north entry. Section B (sample 20133) was cut from the face of 41 room, 13 north entry. Section C (sample 20134) was cut from the face of 14 north entry. Section D (sample 20142) was cut at face of 13 south entry.

The ultimate analysis of a composite sample made by combining face samples 20132, 20133, 20134, and 20142 is shown under laboratory No. 20135.

The room-and-pillar system of mining is used. In 1914 the coal was shot down with black blasting powder and was all screened and picked on a belt. Pieces of the roof became mixed with the coal. The screenings up to three-fourths inch were washed, producing 2-inch, ¾-inch, and $\frac{5}{16}$-inch sizes. The average daily output was 412 tons. Seventy-five per cent of the coal was taken out in advance work; the entry pillars were lost.

For geologic relations of this coal, see U. S. Geol. Survey Bull. 431, 1911, p. 134.

GARNSEY. GARNSEY MINE.

Analyses 25431 to 25434 (p. 17). Bituminous coal, Cahaba field, from Garnsey mine, a slope mine in sec. 7, T. 22 S., R. 4 W., at Garnsey, on the Southern Ry. Coal bed, Thompson; Carboniferous age, Pottsville group. Bed 5 to 6 feet thick; dips 11° to 15°, with a few rolls or horsebacks; roof, fairly good, shale; floor, hard clay shale, with smooth surface. The bed was sampled by E. B. Sutton on June 15, 1916, as described below.

Sections of coal bed in Garnsey mine.

Section	A	B	C
Laboratory No.	25432	25433	25431
Roof, shale and sandstone.	*Ft. in.*	*Ft. in.*	*Ft. in.*
"Rash"	[a] 3	[a] 6	[a] 1½
Coal	3 4	1 5	2 9
Coal, bony	..	[a] 7	..
Shale	[a] 1 3¾	[a] 1 3½	[a] 1 3½
Coal	1 3	1 7	1 0
Floor, hard shale.			
Thickness of bed	6 1¾	5 4½	5 2
Thickness of coal sampled	4 7	3 0	3 9

[a] Not included in sample.

Section A (sample 25432) was measured 8,000 feet southeast of pit mouth. Section B (sample 25433) was measured 5,000 feet southwest of pit mouth. Section C (sample 25431) was measured 4,700 feet southeast of pit mouth.

The ultimate analysis of a composite sample made by combining face samples 25431, 25432, and 25433 is given under laboratory No. 25434.

The room-and-pillar system of mining is used. In 1916 the coal was undercut with machines and was shot down with black powder and permissible explosives. The output was about 900 tons per day, which was to be increased soon. The probable lifetime of the mine was about 36 years.

For analyses and descriptions of other samples of coal from this mine, see Bureau of Mines Bull. 22, 1913, pp. 33, 34, 333, and 334.

For geologic relations of this coal, see U. S. Geol. Survey Bull. 431, 1911, pp. 91, 134.

Marvel. Marvel Mine.

Analyses 25379 to 25382, and 25384 (p. 17). Bituminous coal, Cahaba field, from Marvel mine, a slope mine in sec. 7, T. 22 S., R. 4 W., at Marvel, on the Louisville & Nashville R. R. and the Southern Ry. Coal bed, Clark (Blocton No. 1, Buck, Woodstock); Carboniferous age, Pottsville group. Bed 3½ to 4½ feet thick. Roof, shale, about 5 feet thick; this shale is overlain by about 15 feet of sandstone. Floor, sandstone. Dip, 7° to 15° S. 66° E. Many rolls or horsebacks occur. The bed was sampled by E. B. Sutton on June 8, 1916, as described below:

Sections of coal bed in Marvel mine.

Section	A	B	C	D
Laboratory No.	25379	25380	25381	25384
Roof, shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	6	4	6	7½
Shale	[a] 3	[a] 6	[a] 3	[a] 2¼
Coal	2 7	2 3	2 9	2 9¾
"Rash"	[a] 4	9	[a] 6	[a] 6
Floor, sandstone.				
Thickness of bed	3	3 10	4 0	4 14½
Thickness of coal sampled	3 1	2 7	3 3	3 5

[a] Not included in sample.

Section A (sample 25379) was measured at face of 15 left entry, about 5,400 feet southeast of pit mouth. Section B (sample 25380) was measured at face of 8 right entry, about 3,000 feet south of pit mouth. Section C (sample 25381) was measured at face of 15 room, 8 right entry, No. 1 panel, 2,000 feet south of pit mouth. Section D (sample 25384) was measured at face of 9 left entry, about 4,000 feet east of pit mouth.

The ultimate analysis of a composite sample, made by combining face samples 25379, 25380, 25381, and 25384, is shown under laboratory No. 25382.

The room-and-pillar system of mining is used. In 1916 some of the coal mined was undercut by machine, but most of it was shot from the solid. The coal was shot down with permissible explosives and black blasting powder by the miners at the end of the shift. All coal less than 2 inches in size was washed, coal larger than 2 inches was separated into three sizes, each of which went over picking belts. The output of the mine was about 1,000 tons per day, chiefly derived from advance work.

For analyses and descriptions of other samples of coal from this mine, see Bureau of Mines Bull. 22, 1913, pp. 34, 334, 335.

For geologic relations of this coal see U. S. Geol. Survey Bull. 431, 1911, p. 126.

Piper. Piper No. 1 Mine.

Analyses 25383, 25385, 25386, and 25387 (p. 18). Bituminous coal, Cahaba field, from Piper No. 1 mine, a slope mine in sec. 2, T. 24 N., R. 10 E., at Piper, on the Louisville & Nashville R. R. and the Southern Ry. Coal bed, Thompson (or Underwood); Carboniferous age, Pottsville group. Bed is about 4 feet thick; dips 8° 30′ S., 14° E.; has practically no cleat; one fault and a few horsebacks rolls. Roof, weak shale, seamy, and full of slips; floor, hard sandstone. Cover, about 365 feet. The bed was sampled June 6, 1916, by E. B. Sutton, as described below:

Sections of coal bed in Piper No. 1 mine.

Section	A	B	C
Laboratory No.	25383	25385	25386
Roof, sandstone and shale.	*Ft. in*	*Ft. in.*	*Ft. in.*
Coal	11½	-- --	-- --
"Rash"	[a] 2½	[a] 1 6	[a] 1 0
Coal	2 11½	4 2½	2 9½
Floor, sandstone.			
Thickness of bed	4 1½	5 8½	3 9½
Thickness of coal sampled	3 11	4 2½	2 9½

[a] Not included in sample.

Section A (sample 25383) was measured at face of 20 east entry. Section B (sample 25385) was measured at face of 21 west air course. Section C (sample 25386) was measured at face of 31 room, 5 west entry.

The ultimate analysis of a composite sample, made by combining face samples 25383, 25385, and 25386, is shown under laboratory No. 25387.

The room-and-pillar system of mining is used. In 1916 the coal was shot from the solid with black powder. Two grades of coal were made, lump and nut, and slack. One shaker screen was provided, in which plates with openings varying from 4 by 6 inches to 6 by 8 inches were placed. The coal was picked in the railroad cars, and was not washed or coked.

For analyses and descriptions of other samples of coal from this mine, see Bureau of Mines Bull. 22, 1913, pp. 35, 335, 336.

For geologic relations of this coal see U. S. Geol. Survey Bull. 431, 1911, p. 133.

DE KALB COUNTY.

Blanche. Underwood Prospect Pit.

Analysis 18232 (p. 18). Semibituminous coal, Lookout Mountain field, from Underwood prospect pit, in sec. 31 (?), T. 7 S., R. 10 E., 1 mile west of Blanche, a station on the Tennessee, Alabama & Georgia R. R. Coal bed, not named; Carboniferous age, Pottsville group. Dip, flat; roof, sandstone; floor, fire clay. The bed was sampled by Charles Butts on November 20, 1913. The sample was cut 10 feet from the mouth of the pit. It represented 1 foot 9 inches of dry coal. There was 2 inches of "rash" below the coal. The sample was cut 6 inches beneath the surface, which had been exposed to weathering for about four months.

BLANCHE. YELLOW CREEK MINE.

Analyses 18230, 18233, and 18234 (p. 18). Semibituminous coal, Lookout Mountain field, from Yellow Creek mine, a drift mine in sec. 24 (?), T. 7 S., R. 9 E., 3 miles northwest of Blanche, a station on the Tennessee, Alabama & Georgia R. R. Coal bed known as Yellow Creek; Carboniferous age, Pottsville group. Bed lies flat. Roof and floor, shale; cover, 50± feet. The bed was sampled by Charles Butts on November 20, 1913, as described below:

Sections of coal bed in Yellow Creek mine.

Section	A	B	C
Laboratory No.	18230	18233	18234
Roof, shale.			
Coal	Ft. in. 1 1	Ft. in. 1 1	Ft. in. 1 1
Clay	[a] ½	½	[a] ½
Coal	3	3	3
Clay	[a] ½	½	[a] ½
Coal	4	4	4
Clay	[a] 1	1	[a] 1
Coal	3½	3½	3½
Floor, shale.			
Thickness of bed	2 1½	2 1½	2 1½
Thickness of coal sampled	1 11½	2 1½	1 11½

[a] Not included in sample.

Section A (sample 18230) was measured 300 feet south of mine mouth at face of coal that had been exposed to the weather for 10 months. The sample was dry. Section B (sample 18233) was measured in same locality as section A. It represented coal 20 inches below surface coal that had weathered for 10 months. The sample was dry. Section C (sample 18234) was measured in the same locality as section A. It represented coal 1 foot below the face of coal that had weathered 10 months. The sample was dry.

FORT PAYNE. BEESON GAP MINE.

Analysis 18231 (p. 18). Semibituminous coal, Lookout Mountain field, from Beeson Gap mine, a drift mine in sec. 24 (?), T. 7 S., R. 9 E., 1 mile northeast of Fort Payne, on the Alabama Great Southern R. R. Coal bed not named; Carboniferous age, Pottsville group. Bed lies flat. Roof, sandstone; floor, fire clay. The sample was cut on November 20, 1913, by Charles Butts, 200 feet northeast of the mine mouth, and represented the entire coal bed, 1 foot 1 inch thick. The sample was taken from coal 6 inches beneath the face, which had been exposed to weathering for about four months. The coal was dry.

JEFFERSON COUNTY.

DOCENA. DOCENA MINE.

Analyses 19645, W46918 to W46922, W46544, and W46545 (pp. 18–19). Bituminous coal, Warrior field, from Docena mine, a shaft mine at Docena, 4 miles northwest of Ensley, on the Birmingham Southern R. R. Coal bed, Pratt; Carboniferous age, Pottsville group. Bed lies flat; no faults; rolls are rather frequent. Bed 3 feet 5 inches to 4 feet 4 inches thick; roof and floor, sandstone. The bed was sampled by E. B. Sutton on June 30, 1914, as described below:

Sections of coal bed in Docena mine.

Section	A	B	C	D	E
Laboratory No.	W46921	W46918	W46920	W46922	W46919
Roof, sandstone.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	8	6	7	7	6½
Shale	[a] 2	[a] 2	[a] 1¾	[a] 2	[a] 1½
Coal	3 6	3 2	2 9	2 10	3 2½
Floor, sandstone.					
Thickness of bed	4 4	3 10	3 5¾	3 7	3 10½
Thickness of coal sampled	4 2	3 8	3 4	3 5	3 9

[a] Not included in sample.

Section A (sample W46921) was cut at the face of 52 room, 2 left entry, southeast slope. Section B (sample W46918) was cut at the face of the southeast slope. Section C (sample W46920) was cut at the face of the main south slope air course. Section D (sample W46922) was cut at the face of 7 left entry, main south slope. Section E (sample W46919) was cut at the face of 20 room, 5 right entry, main south slope.

The ultimate analysis of a composite sample made by mixing samples W46918, W46919, W46920, and W46921 is given under laboratory No. 19645.

One sample represented by duplicate laboratory tests Nos. W46544 and W46545 was obtained from six cars as they were being loaded aboard the steamship *Brutus* at Pensacola, Fla. A proportionate amount of the gross sample of about 1,000 tons was taken from each car, which was quartered down to a 6-pound sample.

The mine is worked on the room-and-pillar system. In 1914 the coal was undercut with electric chain breast coal-cutting machines, and was shot down with permissible explosives, which were also used for brushing the roof and the floor. The machine cuttings were loaded out before blasting. Particles of the roof and the floor did not mix with the coal in mining and loading. The coal was dumped from mine cars into bins in the mine, from which it was dumped into 6-ton skips and hoisted to the top, where the skips discharged the coal automatically upon the shaker screen, which was 20 feet long by 10 feet wide, with 2-inch perforations. The coal was picked as it passed out from the screen. The greater part of the shale parting was picked out by the miner at the face. There were two loading tracks with a capacity of 30 empty and 20 loaded cars. At the time the samples were taken the mine had been in operation for six years. The product was largely shipped on foreign orders, or made into coke. The daily output was about 1,200 tons per day, which was to be increased.

For geologic relations of this coal see U. S. Geol. Survey Bull. 285, 1906, p. 212.

ENSLEY (BIRMINGHAM). PRATT NO. 4 MINE.

Analyses W46826, W46827, W46828, W46831, W46832, 19641, W46527, and W46528 (p. 19). Bituminous coal, Warrior field, from Pratt No. 4 mine, a slope mine at Ensley, a suburb of Birmingham, on the Birmingham Southern R. R. Coal bed, Pratt; Carboniferous age, Pottsville group. Bed is about 3 feet 9 inches thick, is practically level, with some faults, rolls, and "horsebacks," and has a shale parting

about 2 inches thick, and approximately 7 inches from roof. Roof, sandstone; floor, shale and sandstone. The bed was sampled by E. B. Sutton on June 24, 1914, as described below:

Sections of coal bed in Pratt No. 4 mine.

Section	A	B	C	D	E
Laboratory No.	W46826	W46828	W46832	W46831	W46827
Roof, sandstone.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal	8½	4	7	7	9
Shale	[a] 1½	[a] 1	[a] 1½	[a] 2	[a] 2
Coal	4 1	3½	2 10	2 9	3 2
Shale	.. ..	[a] 1½	.. ..	.. ..	.. ..
Coal	.. ..	3 1	.. ..	.. ..	.. ..
Floor, shale and sandstone.					
Thickness of bed	4 11	3 11	3 6½	3 6	4 1
Thickness of coal sampled	4 9½	3 8½	3 5	3 4	3 11

[a] Not included in sample.

Section A (sample W46826) was cut at the face of 10 room, A west entry. Section B (sample W46828) was cut on the pillar at face of 17 room, 35 west entry. Section C (sample W46832) was cut on the pillar at face of 1 room, 42 east cross entry. Section D (sample 46831) was cut on the pillar at face of 1 room, 13 cross entry, back slope. Section E (sample W46827) was cut on the pillar at the face of 8 room, 10 cross entry, back slope.

The ultimate analysis of a composite sample made by combining face samples W46826, W46827, W46831, and W46832 is given under Laboratory No. 19641.

One sample, represented by duplicate laboratory tests Nos. W46527 and W46528, was obtained from nine railroad cars as they were being loaded aboard the steamship *Brutus* at Pensacola Fla.

The mine is worked on the room-and-pillar method. At the time of sampling the coal was undercut by electric breast chain coal-cutting machines. Permissible explosives were used for breaking down the coal and for brushing the roof and floor. The undercuttings were loaded out with the coal. The miner attempted to reject the shale partings while loading coal at the face. None of the coal was shipped as run-of-mine. Except when foreign orders were being filled, all the coal was crushed, washed, and coked. When lump coal was desired, the coal was dumped from the mine cars onto a shaker screen 15 feet long by 4 feet wide, with 2½-inch perforations. One picker was employed, and in special cases two pickers, while the coal was being loaded into railroad cars. There were two loading tracks with a capacity of 30 empty and 25 loaded railway cars. The mine is old, and fully 90 per cent of the coal was gained from pillars. The average daily output was about 750 tons, which promised to be reduced rather than materially increased.

For analyses and descriptions of other samples of coal from this mine see Bureau of Mines Bull. 22, 1913, pp. 38, 347.

For geologic relations of this coal see U. S. Geol. Survey Bull. 285, p. 212.

Mulga. Edgewater Mine.

Analyses W46660 to W46664, W46691 to W46695, 19643, W46288, W46289, W46294, W46295, W46342 to W46347, W46546 to W46551 (pp. 19–20). Bituminous coal, Warrior field, from the Edgewater mine, a shaft mine 2½ miles northeast of Mulga, on the Birmingham Southern R. R. Coal bed, Pratt; Carboniferous age, Pottsville group. Bed is about 5 feet thick, and is practically flat, but is faulted near the shaft. The displacement is 179 feet. Coal is hoisted from both levels. Roof and floor, sandstone. Impurities, two regular shale partings. The bed was sampled by E. B. Sutton on June 17 and 18, 1914, as described on the following page.

Sections of coal bed in Edgewater mine.

Section	A	B	C	D	E
Laboratory No.	W46660	W46662	W46663	W46664	W46661
Roof, sandstone.					
Coal	7	6½	4	5½	4½
Shale	a 1¾	a 1½	a 1¾	a 1¾	a 2
Coal	3 8	3 1½	3 4½	3 0	3 2
Shale	a 6	a 7½	a 7	a 8½	a 6
Coal	9	6	11	11	8¾
Floor, sandstone.					
Thickness of bed	5 7¾	4 11	5 4½	5 2½	4 11½
Thickness of coal sampled	5 0	4 2	4 7½	4 4¼	4 3¼

a Not included in sample.

Section	F	G	H	I	J
Laboratory No.	W46692	W46695	W46691	W46694	W46693
Roof, sandstone.					
Coal	6	7	8½	8	8
Shale	a 3	a 1¾	a 1	a 1	a 1¼
Coal	3 11	3 0	3 5	3 5½	3 8
Shale	a 4	a 4½	a 4	a 4	a 7½
Coal	5	6	8	6¼	9
Floor, sandstone.					
Thickness of bed	5 5	4 7¼	5 2½	5 ½	5 9¾
Thickness of coal sampled	4 10	4 1	4 9½	4 7½	5 1

a Not included in sample.

Section A (sample W46660) was measured at the face of 6 east entry, 1 south heading. Section B (sample W46662) was measured at the face of 7 west entry, 1 south heading. Section C (sample W46663) was measured at the face of 2 west entry, 1 north heading. Section D (sample W46664) was measured at the face of 2 north entry, main west heading. Section E (sample W46661) was measured at the face of 2 south entry, main west heading. Section F (sample W46692) was measured at the face of main south heading, bottom level. Section G (sample W46695) was measured at the face of 6 west entry, 2 north heading, bottom level. Section H (sample W46691) was measured at the face of 6 east entry, 2 north heading, bottom level. Section I (sample W46694) was measured at the face of 1 east entry, 2 north heading, bottom level. Section J (sample W46693) was measured at the face of 20 room, 1 left entry, main south heading, bottom level.

The results of an ultimate analysis of a composite sample made by mixing equal parts from the ten samples mentioned above are given under laboratory No. 19643.

Forty-five of one hundred cars ordered were sampled at the mine as they were being loaded. The samples were collected by placing a shovel under the coal as it fell from the loading boom. One hundred pounds was collected from each of the first 40 cars, and 200 pounds each from the last 5 cars. The coal from the first 40 cars was combined into four samples and that from the last 5 cars into a fifth sample, each sample being about 1,000 pounds. These were then screened separately to pass through ½-inch mesh and twice coned and quartered; these samples were then crushed to pass through ¼-inch mesh and again coned and quartered, resulting in samples of 6 pounds, each of which was placed in two cans and forwarded to the laboratory, and are represented by the following duplicate samples: W46288 and W46289; W46294 and W46295; W46342 and W46343; W46344 and W46345; and W46346 and W46347.

Three samples were collected in duplicate from the cars as they were being unloaded at Pensacola, Fla., and are represented by the following duplicate analyses: W46546 and W46547; W46548 and W46549; and W46550 and W46551. The latter samples were prepared in the same manner as the former samples taken at the mine.

The mine is worked by the room-and-pillar system. In 1914 the coal was undercut with electric chain-cutting machines and shot down with permissible explosives. The mine had been opened for four years only. The cars were dumped within the

mine on a revolving dump into bins of 20 tons capacity, and then loaded into 6-ton skips. The coal was dumped automatically onto a shaker screen 15 feet long by 5 feet wide, having 2½-inch perforations. The miners rejected a large part of the shale partings at the face, and pickers were employed on the table, loading boom, and cars. The daily average output was 2,600 tons. The capacity of the equipment was 5,000 tons per day. All of the coal was taken from advance workings.

For geologic relations of this coal, see U. S. Geol. Survey Bull. 285, 1906, p. 214.

Mulga. Mulga mine.

Analyses, 19970, 19971 19978, 19979, 19980, and 19972 (p. 20). Bituminous coal, Warrior field, from Mulga mine, in Birmingham district, in sec. 18, T. 17 S., R. 4 N., a shaft mine at Mulga, on the Birmingham Southern R. R. Coal bed, Pratt; Carboniferous age, Pottsville group. Bed averages 4 feet thick; lies flat. Roof, sandstone and shale; floor, smooth sandstone. Thickness of cover, 150 feet. Rolls and horsebacks are occasionally encountered in mining. This bed was sampled by E. B. Sutton on October 17, 1914, as described below:

Sections of coal bed in Mulga mine.

Section	A	B	C	D	E
Laboratory No.	19970	19971	19978	19979	19980
Roof, sandstone and shale.					
Coal	5½	3½	5	6½	5½
Shale	a 3½	a 2	a 4	a 4	a 2½
Coal	2 2½	2 5½	2 8½	2 4	2 4½
Shale	a 7	a 5½	a 5¾	a 6½	a 6
Coal	5	9½	10	1 0	6½
Floor, sandstone.					
Thickness of bed	3 11	4 1½	4 9	4 8¾	4 ½
Thickness of coal sampled	3 ¾	3 6¼	3 11¼	3 10½	3 2¼

a Not included in sample.

Section A (sample 19970) was measured at the face of 7 left entry, north haulage road. Section B (sample 19971) was measured at the face of 19 room, 8 right entry, north haulage road. Section C (sample 19978) was measured at the face of 22 room, main east entry. Section D (sample 19979) was measured at the face of 6 room, 5 right entry, 1 north entry, main east entry. Section E (sample 19980) was measured at the face of 33 room, 4 left entry, north haulage way.

The ultimate analysis of a composite sample made by combining face samples 19970, 19971, 19978, 19979, and 19980 is shown under laboratory No. 19972.

The room-and-pillar system of mining is used. In 1914 the coal was undercut with machines, and was shot down with permissible explosives at night by shot firers. The shaft was 225 feet deep. About 50 per cent of the coal was taken out in advance work. The average shipments were about 1,200 tons per day. The mine was equipped for 2,500 tons daily output. The coal was dumped onto a bar screen, bars 1½ inches apart. The large coal passed onto a picking table. The finer parts of the coal were sent to be coked. A washer was being erected for cleaning the coal going to coke ovens.

For analyses and descriptions of other samples of coal from the mine, see Bureau of Mines Bull. 22, 1913, pp. 37, 343, 344.

For geologic relations of this coal, see U. S. Geol. Survey Bull. 285, 1906, p. 214.

Pinson. Dixana No. 4 Mine.

Analyses 22467 to 22471, 22575 to 22579 (pp. 20–21). Bituminous coal, Warrior field, from Dixana No. 4 mine, a slope mine in sec. 13, T. 15 S., R. 2 W., 3 miles northwest of Pinson, on the Birmingham and the Louisville & Nashville Railroads. Coal bed, Black Creek; Carboniferous age, Pottsville group. Bed 2 to 5 feet thick; dips 3 per

cent southwest. Roof, 1 to 6 inches of sandstone; floor, hard fire clay. Thickness of cover, 175 feet. Faults and rolls are found in the seam. The bed was sampled by J. M. Webb and W. T. Burgess on June 7 to 9, 1915, as described below:

Section A (sample 22467) represented a 1-foot 11-inch cut of coal. It was measured at face of 8 room, 12 left entry, 3,000 feet southwest of mine opening. Section B (sample 22468) represented a 2-foot 2½-inch cut of coal. It was measured at face of 15 right air course, 3,300 feet west of mine opening. Section C (sample 22469) represented a 3-foot 8-inch cut of coal. It was measured at face of 13 right entry, 2,800 feet northwest of mine opening. Section D (sample 22470) represented a 2½-foot cut of coal. It was measured at face of 8 left entry, 2,500 feet northwest of mine opening.

The ultimate analysis of a composite sample made by combining face samples 22467, 22468, 22469, and 22470 is given under laboratory No. 22471.

Eight samples of washed coal were taken at the loading chute from the washer bins, as the cars were being loaded, a 500-pound gross sample being taken in each case. Sample 22466 represented washed nut coal, and samples 22472, 22473, 22474, 22475, 22476, 22477, 22478 represented washed pea coal. A composite sample was made by mixing samples 22472 to 22478. The results of an ultimate analysis of this sample is shown under laboratory No. 22479.

The room-and-pillar system of mining is used. In 1915 the coal was shot off the solid by miners during the shift, black blasting powder and permissible explosives, which were also used in brushing the roof, being employed.

The coal was screened over 3-inch bar screens 12 feet long with 4-inch openings for lump coal, and ¾-inch to ½-inch openings for smaller sizes. It was shipped as nut, egg, pea, and slack. About half of the product was washed. The output was 450 to 500 tons per day. About 65 per cent of the coal was taken out in advance workings, with a total recovery of 75 per cent.

For geologic relations of this coal see U. S. Geol. Survey Bull. 285, p. 219.

Sayreton. Sayreton Mine.

Analyses 20993, 20994, and 20996 (p. 21). Bituminous coal, Warrior field, from Sayreton mine, a slope mine at Sayreton, about 2 miles from Birmingham, on the railroad of the Republic Iron & Steel Co. Coal bed, Mary Lee; Carboniferous age, Pottsville group. Thickness of coal mined, 5 feet 6 inches to 7 feet 6 inches. Bed has a dip of 25° to flat; is overlain by 5 feet of sandstone and "slate" and 1½ inches of shale, and the floor is 12 inches of shale and 4 inches of coal. Vertical depth to landings (below entrance), 400 to 650 feet. The bed was sampled by E. B. Sutton, February 5, 1915, as described below:

Sections of coal bed in Sayreton mine.

Section	A		B		C	
Laboratory No.	20993		20994		20996	
Roof, sandstone, "slate," and shale.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Coal	1	9¾	1	4	1	3½
Coal, bony	..	..	..	..		[a] ½
Shale		[a] 2		[a] 1½	..	..
Coal		6		4½		3¾
Shale		[a] 3		[a] 1½		[a] 1¼
Coal, bony		[a] 9½	..	..	..	..
Coal	1	2		5		5½
Shale	..	..		4		[a] 5½
"Rash"		[a] ¼	..	..	..	..
Coal, bony	..	..		[a] 7½		[a] 7
Coal	2	3¼	2	6		6
"Rash"	..	..		[a] 1		[a] ¾
Coal	..	..		6½		8½
Shale	..	..	..	..		[a] 1
Coal	..	..	..	..	1	8½
Floor, shale and coal.						
Thickness of bed	7	½	6	5	6	3½
Thickness of coal sampled	5	9½	5	5¾	4	11½

[a] Not included in sample.

Section A (sample 20993) was measured at the face of 57 room, 13 west entry. Section B (sample 20994) was measured at the face of 58 room, 11 west entry. Section C (sample 20996) was a pillar sample measured near the face of 80 room, 10 east entry.

The ultimate analysis of a composite sample made by combining face samples 20993 and 20994 is given under laboratory No. 20995.

The room-and-pillar system of mining is used. In 1915 the coal was mined by hand, and shot down with permissible explosives. All of the coal was crushed, washed, and shipped to coke ovens. There were two tracks with a capacity of 18 empty and 18 loaded cars. The output was about 1,680 tons a day, about 75 per cent of which was from advance workings. The maximum day's run was 1,806 tons. In advance workings about 65 per cent of the coal was taken out. An area of about 1,000 acres is being mined, containing about 7,000,000 tons.

For geologic relations of this coal see U. S. Geol. Survey Bull. 285, 1906, p. 216.

Wylam (Birmingham). Pratt No. 5 Mine.

Analyses W46829, W46830, W46833, W46834, 19642, W46516, and W46517 (p. 21). Bituminous coal, Warrior field, from Pratt No. 5 mine, a drift mine at Wylam station, a suburb of Birmingham, Ala., on the Birmingham Southern R. R. Coal bed, Pratt; Carboniferous age, Pottsville group. Bed is 4 feet 2 inches to 4 feet 9 inches thick, lies practically horizontal, contains faults, rolls, and horsebacks, and has one regular shale parting about 2 inches thick and 7 inches from the roof. Roof and floor, sandstone. The bed was measured and sampled by E. B. Sutton on June 24, 1914, as described below:

Sections of coal bed in Pratt No. 5 mine.

Section	A	B	C	D
Laboratory No.	W46829	W46833	W46834	W46830
Roof, sandstone.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal	7½	9¼	6½	7½
Shale	[a] 2	[a] 2	[a] 1½	[a] 2
Coal	3 4½	3 10¼	3 6	3 5¾
Floor, sandstone.				
Thickness of coal bed	4 2	4 9½	4 2	4 3¼
Thickness of coal sampled	4 0	4 7½	4 ½	4 1¼

[a] Not included in sample.

Section A (sample W46829) was measured on a pillar in 44 room, 30 west entry. Section B (sample W46833) was measured at the face of 33 west air course. Section C (sample W46834) was measured on a pillar in 2 room, old 31 west entry. Section D (sample W46830) was measured at the face of 37 west air course.

An ultimate analysis of a composite sample made by combining samples W46829, W46830, W46833, and W46834 is shown under laboratory No. 19642.

Two samples of coal were collected at Pensacola, Fla., as the coal was being loaded from the cars to the steamship *Brutus*. These samples were procured by taking shovelful lots at intervals. A proportionate amount was taken from each car to make a gross sample of about 1,000 pounds, which was broken to ½-inch mesh, coned, and quartered down to 250 pounds; then broken to pass ¼-inch mesh, and further coned and quartered to a sample of 6 pounds, which was placed in two cans and forwarded to the laboratory at Washington for analysis.

Duplicate samples Nos. W46516 and W46517 represented a combined sample from 10 cars.

The mine is worked by the room-and-pillar system. In 1914 the coal was undercut with electric breast chain coal-cutting machines. Permissible explosives were used for breaking down the coal and brushing the roof and the floor. Machine cuttings were loaded out with the coal. The miners attempted to reject all the shale at the face. Particles of the roof and floor did not generally become mixed with the coal

in mining. Primarily the coal was crushed, washed, and made into coke for the company's use. Shaker screens were used, which were 15 feet long and 5 feet wide, with 2-inch perforations. About 75 per cent of the coal passed through the screens. The tracks had a capacity of 40 empty and 30 loaded cars. The mine is old, and fully 60 per cent of the coal was gained from pillars. The average daily output was about 1,000 tons. The probable lifetime of the mine was 10 years.

For geologic relations of the coal see U. S. Geol. Survey Bull. 285, 1906, p. 214.

WYLAM. PRATT NO. 8 MINE.

Analyses W46821 to W46825, 19644, W46529, and W46530 (p. 21). Bituminous coal, Warrior field, from Pratt No. 8 mine, a slope mine, at Wylam, on the Birmingham Southern R. R. Coal bed, Pratt; Carboniferous age, Pottsville group. Bed is 4 feet to 5 feet 3 inches thick, lies practically horizontal, and has one shale parting 2 inches thick, about 7 inches from roof. Frequent faults and occasional rolls and horsebacks are encountered. Roof and floor, sandstone. The bed was sampled by E. B. Sutton on June 25, 1914, as described below:

Sections of coal bed in Pratt No. 8 mine.

Section	A	B	C	D	E	F
Laboratory No.	(a)	W46823	W46822	W46821	W46825	W46824
Roof, sandstone.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	9¼	4½	3½	7	7	8½
Shale	b 2	b 2	b 1	b 2½	b 2	a 1½
Coal	4 3½	3 5¼	7¼	3 4½	3 4½	3 6
Shale	.. ..	.. ..	b 2	.. ..	.. ..	.. ..
Coal	.. ..	.. ..	3 6½	.. ..	.. ..	.. ..
Floor, sandstone.						
Thickness of bed	5 2¾	3 11¾	4 8¼	4 2	4 1½	4 4
Thickness of coal sampled	5 ¾	3 9¾	4 5¼	3 11½	3 11½	4 2½

a Sample lost. b Not included in sample.

Section A (sample lost) was cut at the face of 14 room, 11 east entry, main west slope. Section B (sample W46823) was cut at the face of the main west slope. Section C (sample W46822) was cut at the face of 6 room, 3 right entry, back slope. Section D (sample W46821) was cut at the face of 7 room, 13 west entry, main west slope. Section E (sample W46825) was cut on a pillar at the face of 26 east entry. Section F (sample W46824) was cut on a pillar in 10 room, 29 west entry.

The ultimate analysis of a composite sample made by mixing samples W46821 to W46825 is given under laboratory No. 19644.

One sample was obtained in duplicate (laboratory Nos. W46529 and W46530) from four cars as they were being loaded aboard the steamship *Brutus*, at Pensacola, Fla. A proportionate amount of the 1,000-pound gross sample was taken from each car, and crushed to pass ½-inch mesh, coned, and quartered to a 250-pound sample; then recrushed to pass ¼-inch mesh, and again coned and quartered to a sample of 6 pounds, which was placed in two cans and sealed.

The mine is worked by the room-and-pillar system. In 1914 the coal was undercut with electric chain breast coal-cutting machines, and shot down with permissible explosives, which were also used for brushing the floor and the roof. Machine cuttings were loaded out before blasting. Particles of roof and floor did not mix with the coal in mining to any great extent. Ordinarily the entire output was crushed, washed, and coked. When lump coal was desired, the coal was dumped onto shaking screens 16 feet long and 5 feet wide with 2-inch perforations. The coal was picked on the conveyor and on the cars. The miners rejected the "slate" at the face as far as possible. The tracks had a capacity of 40 empty and 35 loaded cars. The workings were well advanced; fully 40 per cent of the output was from pillars. The average daily output was about 1,150 tons, with a maximum day's run of 1,340 tons.

For geologic relations of this coal see U. S. Geol. Survey Bull. 285, 1906, p. 214.

ST. CLAIR COUNTY.

PARSONS. ACMAR MINE.

Analyses 18853, 18854, and 18855 (p. 22). Bituminous coal, Cahaba field, from Acmar mine, a slope mine at Acmar, 1 mile west of Parsons, in sec. 24, T. 16 S., R. 1 E., on the Central of Georgia Ry. Coal bed, Harkness; Carboniferous age, Pottsville formation. Thickness, 9 to 25 feet; dip, 8°; roof, blue shale and sandstone; floor, smooth siliceous shale. The upper bench is separated from the lower one by 13 inches of "rash." The coal lies in a general syncline. There are a large number of thick bony-coal and shale partings, which can not be separated from the coal at the face. Thickness of cover at points of sampling, about 600 feet. The bed was sampled by E. B. Sutton on February 7, 1914, as described below:

Sections of coal bed in Acmar mine.

Section	A	B
Laboratory No.	18853	18854
Roof, sandstone.	*Ft. in.*	*Ft. in.*
Shale (2½ to 3 inches)	.. ..	.. ..
Coal	3½	3½
Shale	[a] 2½	[a] 3
Coal	9	8
Coal, bony	[a] ⅜	[a] 2
Coal	1¼	3
Coal, bony	[a] ½	[a] 1½
Coal	2½	8½
Bone	[a] 1	[a] 2
Coal	1 0	4½
Bone	[a] 4	[a] 1
Coal	1 1	2 10½
Bone	[a] 1	.. ..
Coal	4½	.. ..
Clay	[a] 4	.. ..
Coal	9½	.. ..
Black shale	[a] 1 5½	[a] 1 1
Coal	1 8	3 8½
Shale	[a] ½	.. ..
Coal	1 1½	.. ..
Black "rash"	[a] 5½	.. ..
Floor, shale.		
Thickness of bed	10 5⅜	10 9
Thickness of coal sampled	7 4½	8 10½

[a] Not included in sample.

Section A (sample 18853) was cut from the face of 19 room, 6 left entry. Section B (sample 18854) was cut from face of 14 room, 5 left entry.

The ultimate analysis of a composite sample made by combining equal portions of face samples 18853 and 18854 is shown under laboratory No. 18855.

The mine is worked on the room-and-pillar system. In 1914 the coal was shot off the solid. Permissible explosives were used to shoot down the coal and also for brushing the floor and the roof. Particles of roof and coal did not become mixed with the coal in loading. Practically all the coal was screened over a shaker screen 15 feet long by 6 feet wide with 4-inch openings; shaking screens 20 feet long by 6 feet wide with 2-inch openings were also used. All that passed this screen was washed. Three pickers were employed in loading the cars. There were three loading tracks, with a capacity of 50 empty and 50 loaded cars. The average daily production was 1,500 tons. Approximately 80 per cent of the coal was from advance work. The total recovery was estimated at 80 per cent. A maximum day's run was 2,017 tons.

For geologic relations of this coal see U. S. Geol. Survey Bull. 431, 1911, p. 108.

SANIE. MARGARET NO. 1 MINE.

Analyses 18549, 18550, 18551, and 18552 (p. 22). Bituminous coal, Cahaba field, from Margaret No. 1 mine, a slope mine 3 miles west of Sanie on the Central of Georgia Ry. Coal bed, Harkness; Carboniferous age, Pottsville group. Average thickness,

5 feet; dip, 8° S. 70° E. Roof, shale; floor, underclay; cover at points of sampling, 1,200 feet. The bed was sampled by E. B. Sutton on June 10 and 27, 1914, as described below:

Sections of coal bed in Margaret No. 1 mine.

Section	A	B	C
Laboratory No.	18549	18550	18551
Roof, shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*
Bony coal	[a] 2½	[a] 3	[a] 2¾
Shale	[a] 3	.. ..	[a] 4
Coal	9½	5	9¼
Shale	[a] 9½	[a] 1 0	[a] 6
Coal	9½	9½	9½
Shale	[a] 1 ¼	[a] 7½	[a] 5½
Coal	2 3	2 6¼	2 9
Floor, clay.			
Thickness of bed	6 1	5 7¾	5 10
Thickness of coal sampled	3 9¾	3 9¼	4 3¾

[a] Not included in sample.

Section A (sample 18549) was measured from the face of 12 north entry. Section B (sample 18550) was measured from the face of 11 south entry. Section C (sample 18551) was measured from the face of 8 south entry.

The ultimate analysis of a composite sample made by combining equal amounts of samples 18549, 18550, and 18551 is given under laboratory No. 18552.

The mine is worked on the room-and-pillar system. In 1914 the coal was shot from the solid with permissible explosives. All the coal mined was screened over two shaker screens, each 20 feet long by 5 feet wide, one with 4-inch openings and the other with 1½-inch openings. About 84 per cent of the coal passed through the screens. The screenings were washed but not coked. Three pickers were employed in loading the cars. The storage-bin capacity was 1,000 tons. Three loading tracks were available with a capacity of 36 empty and 36 loaded cars. The coal was washed before marketing; therefore partings were not included in samples. The daily average production was 500 tons.

For geologic relations of this, see U. S. Geol. Survey Bull. 431, 1911, p. 108.

Sanie. Margaret No. 2 Mine.

Analyses 24374, 24375, 24376, and 24377 (p. 22). Bituminous coal, Cahaba field, from Margaret No. 2 mine, a slope mine 3 miles west of Sanie on the Central of Georgia Ry. Coal bed, Harkness; Carboniferous age, Pottsville group. Bed 6 feet thick; dips 9° S.; no cleat, no faults, occasional rolls or horsebacks. Roof, weak shale; floor, smooth clay. The bed was sampled by E. B. Sutton on March 1, 1916, as described below:

Sections of coal bed in Margaret No. 2 mine.

Section	A	B	C
Laboratory No.	24374	24375	24376
Roof, weak shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*
Bone	[a] 4	.. ..	.. ..
Shale	[a] 6	.. ..	[a] 7
Coal	6	3½	9½
Shale	[a] 9½	[a] 6½	[a] 7
Coal	[a] 8	10	9
Shale	.. ..	[a] 3½	.. ..
Coal	.. ..	6½	.. ..
Shale	[a] 7½	[a] 9	[a] 9
Coal	2 9½	2 9	2 6½
Floor, clay.			
Thickness of bed	6 2½	6 0	6 0
Thickness of coal sampled	3 11½	4 5	4 1

[a] Not included in sample.

Section A (sample 24374) was cut from face of 11 room, 10 south entry. Section B (sample 24375) was cut from face of 11 north entry. Section C (sample 24376) was cut from face of 9 room, 10 north entry.

An ultimate analysis of a composite sample made by combining face samples 24374, 24375, and 24376 is given under laboratory No. 24377.

The room-and-pillar system of mining is used. In 1916 the coal was shot off the solid with permissible explosives. The coal was all passed over 6 and 2 inch shaking screens. There were three loading tracks with capacity for 60 empty and 40 loaded cars. The output is 800 to 1,100 tons per day, about 70 per cent of which was from advance workings. A total recovery of 85 to 90 per cent was claimed.

For geologic relations of this coal, see U. S. Geol. Survey Bull. 431, 1911, p. 109.

SHELBY COUNTY.

Helena. Acton No. 2 Mine.

Analyses 18288 to 18291 (p. 22). Bituminous coal, Cahaba field, from Acton No. 2 mine, a slope mine, 6 miles northeast of Helena on the Louisville & Nashville R. R. Coal bed, Helena; Carboniferous age, Pottsville group. Thickness variable; dip, 22° SE. to nearly vertical E.; roof, shale, overlain with sandstone; floor, sandstone. The bed was sampled by E. B. Sutton on December 9 and 10, 1913, as described below:

Sections of coal bed in Acton No. 2 mine.

Section	A		B		C	
Laboratory No.	18288		18289		18290	
Roof, shale and sandstone.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Coal	4	8	4	6	1	2
Shale		[a] 9	[a] 1	0		[a] 10
Coal	1	6	1	6	1	9
Floor, sandstone.						
Thickness of bed	6	11	7	0	3	9
Thickness of coal sampled	6	2	6	0	2	11

[a] Not included in sample.

Section A (sample 18288) was measured at face of 5 right entry. Section B (sample 18289) was measured at face of 16 room, 8 right entry. Section C (sample 18290) was measured at face of 8 left entry.

The ultimate analysis of a composite sample made by combining equal portions of face samples 18288, 18289, and 18290 is shown under laboratory No. 18291.

The mine is worked by the room-and-pillar system. In 1913 both black powder and permissible explosives were used in shooting down the coal, permissible explosives being used in narrow work and in breaking shots and the black powder being used in slabbing shots. Three grades of coal were produced—namely, select lump, all coal passing a 4-inch screen; nut, that passing a 1½-inch screen; and slack. The average daily output was 250 tons.

For analyses and descriptions of other samples of coal from this mine, see Bureau of Mines Bull. 22, 1913, pp. 39, 350.

For geologic relations of this coal, see U. S. Geol. Survey Bull. 316, p. 78; Bull. 431, 1911, p. 136.

TUSCALOOSA COUNTY.

Rock Castle. Rock Castle Mine.

Analyses 18510, 18511, 18512, and 18513 (p. 23). Bituminous coal, Warrior field, from Rock Castle mine, a slope mine at Rock Castle, 3½ miles southwest of Yolande, in sec. 24, T. 20 S., R. 7 W., on the Louisville & Nashville R. R. Coal bed, Jagger;

Carboniferous age, Pottsville group. Bed dips 20° N., 56° W.; has an average thickness of 7 feet 6 inches, contains three shale partings ranging from 3 to 9 inches thick at the points measured. Roof, shale; floor, hard, smooth shale. In the entries 18 inches of coal is left for roof. Cover at points of sampling, about 1,200 feet. The bed was sampled by E. B. Sutton on January 16, 1914, as described below:

Sections of coal bed in Rock Castle mine.

Section	A	B	C
Laboratory No.	18510	18511	18512
Roof, shale.	Ft. in.	Ft. in.	Ft. in.
Coal, bony	a 4	a 4	a 3
Coal	1 4	1 6	1 4
Shale	a 3½	a 7	a 4
Coal	1 0	1 0	1 2
Shale	a 3	a 4	a 4
Coal	2 6	2 4	2 5
Shale	a 5	a 6	a 9
Coal	1 0	1 3	1 0
Floor, shale.			
Thickness of bed	7 1½	7 10	7 7
Thickness of coal sampled	5 10	6 1	5 11

a Not included in sample.

Section A (sample 18510) was cut from face of 17 room, 18 right entry. Section B (sample 18511) was cut from face of 26 room, 17 right entry. Section C (sample 18512) was cut from face of 1 room, 19 left entry.

The ultimate analysis of a composite sample made by combining equal parts of face samples 18510, 18511, and 18512, is given under laboratory No. 18513.

The mine is worked on the room-and-pillar system. In 1914 the coal was sheared and then broken down with permissible explosives. Permissible explosives were also used for brushing the roof and the floor. The average daily production was 450 tons, practically all of which was shipped as run-of-mine coal and then coked. The screening equipment consisted of bars 12 feet long with 2-inch openings. One picker was employed at the cars. There were two loading tracks with a capacity of 20 empty and 20 loaded cars. A maximum day's run was 802 tons. The existing daily output was to be maintained.

For geologic relations of this coal, see U. S. Geol. Survey Bull. 260, 1905, p. 376.

WALKER COUNTY.

Carbon Hill. Galloway No. 11 Mine.

Analyses 24954 to 24958 (p. 23). Bituminous coal, Warrior field, from Galloway No. 11 mine, a slope mine in sec. 36, T. 13 S., R. 10 W., 1 mile southwest of Carbon Hill, on the St. Louis & San Francisco R. R. Coal bed, Jagger; Carboniferous age, Pottsville group. Thickness, about 3 feet 6 inches; dip, 1½° SW. Roof, shale, about 30 feet thick; floor, fairly hard shale with smooth surface. One 10-foot down-thrust fault occurs. The bed was sampled by E. B. Sutton on April 18, 1916, as described below:

Sections of coal bed in Galloway No. 11 mine.

Section	A	B	C	D
Laboratory No.	24954	24955	24956	24957
Roof, shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal	.. 6½	.. 6½	.. 7	.. 7½
Shale	.. a 6	.. a 8	.. a 7½	.. a 8½
Coal	3 3	2 1	2 2	2 8
Clay	.. ..	.. a 4¼	.. ..	.. a 1
Coal	.. ..	.. 6½	.. ..	.. 7
Floor, hard shale.				
Thickness of bed	4 3½	4 2¼	3 4½	4 8
Thickness of coal sampled	3 9½	3 2	2 9	3 10½

a Not included in sample.

Section A (sample 24954) was measured at face of 1 room, 2 left face heading, 3 left entry. Section B (sample 24955) was measured at face of 7 right entry. Section C (sample 24956) was measured at face of 2 room, 1 right face heading, 3 right entry. Section D (sample 24957) was measured at face of slope.

An ultimate analysis of a composite sample made by combining face samples 24954, 24955, 24956, and 24957, is shown under laboratory No. 24958.

The coal is mined by the room-and-pillar system. In 1916 the coal was undercut by machines, and was shot down with black powder by contract at the end of shift. The output was about 1,200 tons per day. The recovery of coal was about 80 per cent, 75 per cent of which was from advance workings. There were still about 500 acres to be mined from this opening. There was track capacity for 32 empty and 50 loaded cars.

Dora. Sipsey Mine.

Analyses 18404 to 18408 (p. 23). Bituminous coal, Warrior field, from Sipsey mine, a drift mine 9 miles northeast of Dora on the St. Louis & San Francisco R. R. Coal bed, Black Creek; Carboniferous age, Pottsville formation. Bed 2 feet 10 inches thick, lies almost flat. Roof, shale; floor, hard smooth clay. The bed was sampled by E. B. Sutton on January 2 and 3, 1914, as described below:

Sections of coal bed in Sipsey mine.

Section	A	B	C	D
Laboratory No.	18404	18405	18406	18407
Roof, shale and sandstone.				
Coal	.. 1½	.. 5½	.. 3	.. 1½
Shale and "sulphur"	.. a½	.. a¼	.. a¼	.. a¾
Coal	.. 8	.. 4¾	.. 3¾	.. 7½
Shale, fragile	.. a1	Streak.	.. a½	.. a1⅛
Coal	2 3¼	1 11½	2 ¼	1 11½
Floor, clay.				
Thickness of bed	3 1¾	2 9¾	2 7¾	2 9¾
Thickness of coal sampled	3 ½	2 9½	2 7	2 8½

a Not included in sample.

Section A (sample 18404) was measured at face of 6 west entry. Section B (sample 18405) was measured at face of 12 room, 10 west entry. Section C (sample 18406) was measured at face of 13 room, 9 east entry. Section D (sample 18407) was measured at face of 9 room, 5 east entry.

The ultimate analysis of a composite sample made by combining equal parts of samples 18404, 18405, 18406, and 18407 is shown under laboratory No. 18408.

The mine is worked on the room-and-pillar system. In 1914 the coal was undercut by electric machines and broken down with a permissible explosive. About 6 tons of coal were produced per pound of powder. An average daily production of 750 tons was maintained, all of which was screened over a shaker screen 15 feet long by 4 feet wide with 2-inch and 4-inch openings. Ten pickers were employed on the belt conveyor and on cars. About 55 per cent of the coal passed through the screens. About 400 tons of screenings were washed daily. There were three loading tracks with a capacity of 30 cars and a storage bin with a capacity of 75 tons.

ALASKA.

BERING RIVER.

Wardall Ridge. Outcrop.

Analysis 22932 (p. 23). Semibituminous coal, Bering River field, from outcrop on west side of Wardall Ridge, in the SE. ¼ of sec. 10, T. 17 S., R. 8 E. Coal bed not named; Tertiary age, Kushtaka (?) formation. The bed outcrops 30 feet above the

bed from which sample 22933 was taken, and is overlain with sandstone. The bed was sampled at one point by G. W. Evans on August 17, 1915. The bed was about 7 feet thick at the point sampled. The sample was taken from near the grass roots; the coal would doubtless be better under cover.

WARDALL RIDGE. OUTCROP.

Analysis 22933 (p. 23). Semibituminous coal, Bering River field, from outcrop on west side of Wardall Ridge, in the SE. ¼ of sec. 10, T. 17 S., R. 8 E. Coal bed unnamed; Tertiary age, Kushtaka (?) formation. The bed strikes N. 65° E.; dips 45° NW., and is in place, and the strata surrounding it appear to be as regular as any in the field. The bed at the point sampled is overlain with brown shale about 2 feet thick, above which is 2½ feet of coal, and is underlain with sandy shale. The bed was sampled by G. W. Evans on August 17, 1915. The coal was 13 feet thick at the point sampled. The sample represented the upper 8 feet only, the lower 5 feet, which was soft coal, being excluded from the sample. The sample was taken from near the grass roots; the coal no doubt would be better under cover. The sample was taken from outcrop of bed about 30 feet below bed from which sample 22932 was taken.

FAIRHAVEN DISTRICT.

CANDLE. KUGRUK MINE.

Analysis 19928 (p. 23). Subbituminous coal, Seward Peninsula, from Kugruk mine, a drift mine on the Kugruk River, 20 miles from Candle. Coal bed not named; Cretaceous or Tertiary age. Bed about 70 feet thick pitches north and south, dips 60° E. The output of the mine at the time of taking sample was 500 to 1,000 tons per annum. The sample was taken by William Maloney at the face of a stope, 450 feet from the adit, 180 feet vertically below the surface. No other information available.

For geologic relations of the coal, see U. S. Geol. Survey Bull. 379, 1909, p. 362.

IDITAROD DISTRICT.

IDITAROD. PROSPECT OPENING.

Analysis No. 19347 (p. 23). Anthracite coal, Iditarod district, from prospect opening near Iditarod Flat tramway. Coal bed, not named; undetermined age; unnamed formation. The sample was taken by Charles Estmire. No other information available.

MATANUSKA FIELD.

ANTHRACITE RIDGE. OUTCROP.

Analysis 17792 (p. 24). Bituminous coal, Matanuska field, from outcrop on Anthracite Ridge, overlooking Matanuska Glacier; elevation about 5,800 feet. Coal bed not named; Tertiary age; Chickaloon formation. The bed was sampled at one point on the outcrop on Anthracite Ridge, about 500 feet from the extreme eastern end of the anthracite field, by J. T. Ryan on August 22, 1913. No other information available.

For geologic relations of this coal see U. S. Geol. Survey Bull. 592, 1914, p. 282.

BOULDER CREEK. OUTCROP.

Analysis 19346 (p. 24). Bituminous coal, Matanuska field. Sample consisted of pieces picked up on the outcrop near waterfall on the northwest side of Boulder Creek 16½ miles above its mouth. The coal bed is of Tertiary age and outcrops in an outlier of an unrecognized formation. Strike, N. 11° W.; dip, 20° NE. The bed was sampled by G. C. Martin in August, 1913, as described on the following page.

Section of coal bed near waterfall on the northwest side of Boulder Creek, 16½ miles northeast of its mouth.

Laboratory No.	19346
Roof, white sandstone and shale with carbonaceous beds.	*Ft. In.*
Coal and shale	[a] 1 6
Coal	1 3
Shale	[a] 1 0
Coal	[a] 7
Floor, white sandstone and shale.	
Thickness of bed	4 4
Thickness of coal sampled	1 3

[a] Not included in sample.

CHICKALOON RIVER. OUTCROP.

Analysis 18036 (p. 24). Semibituminous coal, Matanuska field, from outcrop on the east bank of the Chickaloon River, 1 mile above the ford. Coal bed, unnamed; Tertiary age, Chickaloon formation. Thickness, 4 inches. The bed was sampled at one point on the outcrop by G. E. Postma in 1913. No other information available.

For geologic relations of this coal see U. S. Geol. Survey Bull. 500, 1912, p. 75.

CHICKALOON RIVER. TUNNEL B.

Analyses 18037, 18039, 18042, 18043, 18044, 18045, 18098, 18099, 18105, 18106, 18141, 18143, 18145, 18146, 18148, 18149, 18150, 18152, 18154, and 18317 (pp. 24-25). Semibituminous coal, Matanuska field, from a prospect tunnel, Tunnel B of United States Navy Alaskan Commission Investigating Expedition. Coal beds Nos. 5, 5½, 6, 8, and 9; Tertiary age, Chickaloon formation. Beds Nos. 5, 5½, 6, and 9 were sampled at one point each by J. T. Ryan and G. W. Salisbury on October 8, 1913; one sample was collected by J. T. Ryan from the slack coal from No. 8 bed on September 25, 1913. Four samples of slack were collected from the "Big Vein" bed by G. E. Postma during October, 1913, and 11 samples were collected from the bunker at the tunnel by G. E. Postma during September and October, 1913, all as described below:

Section of lower No. 5 coal bed in Tunnel B.

Laboratory No.	18148
Roof, bony coal.	*Ft. In.*
Coal, hard and clean	1 4
Coal, streaked with bone	1 7
Bone	[a] 1 9
Floor, gray shale.	
Thickness of coal bed	4 8
Thickness of bed sampled	2 11

[a] Not included in sample.

Sample 18148 was cut in crosscut connecting Tunnels 2 and B.

Section of No. 5½ coal bed in Tunnel B.

Laboratory No.	18141
Roof, carbonaceous shale.	*Ft. In.*
Coal, hard	8
Shale, gray	[a] 1
Coal, clean	11
"Niggerhead"	[a] 4
Coal, clean	11
Coal, bony	[a] 8
Floor, shale and coal.	
Thickness of bed	3 7
Thickness of coal sampled	2 6

[a] Not included in sample.

Sample 18141 was cut along Tunnel B, dip 78° south. Sample 18143 was cut from the upper 2 feet of a 3-foot section of the No. 6 bed in Tunnel B. The lower 1 foot was bone. Sample 18317 represented coal from the No. 8 bed that passed through a screen of ¾-inch mesh.

Section of No. 9 bed in Tunnel B.

Laboratory No.	18150
Roof, gray waxy shale.	*Ft. In.*
Coal, clean	8
Shale, gray	[a] 1
Coal	8
Bone	[a] 4
Coal, impure	5
Coal, bony	1 8
Floor, not stated.	
Thickness of bed	3 10
Thickness of coal sampled	3 5

[a] Not included in sample.

Sample 18150 was cut from the face of Tunnel B. Sample 18317 represented coal through ¾-inch screen from No. 8 bed. Sample 18039 represented the screenings for a three day's run, from the "Big Vein." Sample 18042 represented fines from the "Big Vein." Sample 18043 represented slack from one day's run of coal from the "Big Vein." Sample 18149 represented slack from the "Big Vein." One hundred and fifty pounds of screenings were crushed and split and sample was taken with a scoop, below the hopper, at every third sack.

The following samples were each taken from a 150-pound sample, a scoopful being collected from every third sack while the coal was being sacked:

Sample 18037 represented fines from the bunker at Tunnel B on September 25, 1913.
Sample 18044 represented fines from the bunker at Tunnel B on September 27, 1913.
Sample 18045 represented fines from the bunker at Tunnel B on September 30, 1913.
Sample 18145 represented slack from the bunker at Tunnel B on October 1, 1913.
Sample 18152 represented slack from the bunker at Tunnel B on October 3, 1913.
Sample 18154 represented slack from the bunker at Tunnel B on October 4, 1913.
Sample 18146 represented slack from the bunker at Tunnel B on October 6, 1913.
Sample 18105 represented slack from the bunker at Tunnel B on October 7 and 8, 1913.
Sample 18099 represented slack from the bunker at Tunnel B on October 9, 1913.
Sample 18106 represented slack from the bunker at Tunnel B on October 10, 1913.
Sample 18098 represented slack from the bunker at Tunnel B on October 11, 1913.

Chickaloon River. U. S. N. A. C. I. E. Tunnel C.

Analysis No. 18038 (p. 25). Semibituminous coal, Matanuska field, from a prospect tunnel, Tunnel C of United States Navy Alaskan Commission investigating expedition. Coal bed, C; Tertiary age, Chickaloon formation. Sample 18038 represents the C bed in Tunnel C, and was collected at the face by G. E. Postma on September 8, 1913. No further information available.

Chickaloon River. U. S. N. A. C. I. E. Tunnel D.

Analyses 17793 and 18046 (p. 25). Semibituminous coal, Matanuska field, from a prospect tunnel, Tunnel D of United States Navy Alaskan Commission investigating expedition. Coal beds, E and D; Tertiary age, Chickaloon formation. The E bed was sampled by G. W. Salisbury on September 22, 1913, as described on the following page.

Section of E bed in Tunnel D.

	18046
Laboratory No.	
Roof, gray waxy shale.	*Ft.* *in.*
Coal, clean and bright	2 2
"Sulphur" streaks	[a] 1
Coal	5
Floor, gray shale.	
Thickness of bed	2 8
Thickness of coal sampled	2 7

[a] Not included in sample.

Sample 18046 was cut near the face of the tunnel.

The D bed was sampled by J. T. Ryan on Sept. 1, 1913, as described below:

Section of D bed in Tunnel D.

	17793
Laboratory No.	
Roof, gray coal.	*Ft.* *in.*
Coal	1 6
"Niggerhead"	[a] 6
Coal	10
"Niggerhead"	[a] 4½
Coal, clean	1 5
Coal, bony	1½
Coal	1 6
Floor, gray, waxy shale.	
Thickness of bed	6 3
Thickness of coal sampled	5 4½

[a] Not included in sample.

The sample was cut from the face of 1 left crosscut, 120 feet from the mouth of the tunnel.

CHICKALOON RIVER. U. S. N. A. C. I. E. TUNNEL E.

Analysis 17916 (p. 25). Semibituminous coal, Matanuska field, from Tunnel E of United States Navy Alaskan Commission investigating expedition, a prospect tunnel on Chickaloon River. Coal bed, B; Tertiary age, Chickaloon formation. The bed was sampled by G. W. Salisbury in 1913, as described below:

Section of B bed in Tunnel E.

	Ft. *in.*
Roof, waxy shale.	
Shale, black	[a] 1 1½
Coal, impure	2 5
Floor, gray shale.	
Thickness of bed	3 6½
Thickness of coal sampled	2 5

[a] Not included in sample.

CHICKALOON RIVER. U. S. N. A. C. I. E. TUNNEL 1.

Analyses 18093 and 18101 (p. 26), semibituminous coal, Matanuska field, from Tunnel 1 of the United States Navy Alaskan Commission investigating expedition, a prospect tunnel. Coal bed, No. 8; Tertiary age, Chickaloon formation. The bed was sampled by G. W. Salisbury on October 19, 1913, as described on the following page.

Sections of coal bed in Tunnel 1.

Section	A	B
Laboratory No.	18093	18101
Roof, gray shale.	*Ft. in.*	*Ft. in.*
Coal, bony	[a] 9	[a] 9
Shale, gray, waxy	[a] 9	[a] 9
Coal	1 8	1 8
"Sulphur" band	[a] 1	[a] 1
Coal	7	7
Shale and "sulphur" bands	[a] 5	[a] 5
Coal, impure	1 1	[a] 1 1
Shale, gray	[a] 6	[a] 6
Coal, impure	1 7	[a] 1 7
Floor, gray shale.		
Thickness of bed	7 5	7 5
Thickness of coal sampled	4 11	2 3

[a] Not included in sample.

Section A (sample 18093) was cut from the face of the tunnel, 10 feet from its mouth. Section B (sample 18101) was also cut from the face of the tunnel, 10 feet from its mouth, differing from section A in that only the better part of section was sampled.

CHICKALOON RIVER. U. S. N. A. C. I. E. TUNNEL 2.

Analysis 18153 (p. 26), semibituminous coal, Matanuska field, from Tunnel 2 of the United States Navy Alaskan Commission investigating expedition, a prospect tunnel. Coal bed, Upper No. 5; Tertiary age, Chickaloon formation. The bed was sampled by J. T. Ryan and G. W. Salisbury on October 3, 1913, as described below:

Section of coal bed in Tunnel 2.

	Ft. in.
Roof, gray waxy shale.	
Coal, bright and clear, except for "niggerheads"	1 9
Coal, impure, bordering on bony coal	1 2
Floor, waxy shale.	
Thickness of bed	2 11
Thickness of coal sampled	2 11

Sample 18153 was cut from the face of a crosscut driven west.

CHICKALOON RIVER. U. S. N. A. C. I. E. TUNNEL 3.

Analyses 18095 and 18138 (p. 26). Semibituminous coal, Matanuska field, from Tunnel 3 of United States Navy Alaskan Commission investigating expedition, a prospect tunnel. Coal beds, Nos. 3 and 4; Tertiary age, Chickaloon formation. The No. 3 bed was sampled at one point in the tunnel on October 18, 1913, and the No. 4 bed at one point on October 3, 1913, by J. T. Ryan and G. W. Salisbury, as described below:

Section of No. 3 coal bed in Tunnel 3.

Laboratory No.	18095
Roof, gray waxy shale.	*Ft. in.*
Shale, carbonaceous	[a] 8
Shale, gray	[a] 1
Coal	1 6
"Niggerhead"	[a] 1
Coal	1 1
Shale, gray	[a] 1
Coal	8
Floor, gray waxy shale.	
Thickness of bed	4 2
Thickness of coal sampled	3 3

[a] Not included in sample.

Sample 18095 was cut in left gangway, 52 feet from its mouth.

Section of No. 4 coal bed in Tunnel 3.

Laboratory No.	18138
	Ft. in.
Roof, carbonaceous shale.	
Coal, bony	[a] 11
Coal, hard	1 4
Coal, bony	[a] 4 2
Floor, gray waxy shale.	
Thickness of bed	6 5
Thickness of coal sampled	1 4

[a] Not included in sample.

Sample 18138 was cut from the face of the tunnel, 75 feet from its mouth.

CHICKALOON RIVER. U. S. N. A. C. I. E. TUNNEL 4.

Analyses 17915, 18097, 18100, 18142, and 18318 (pp. 26-27). Semibituminous, Matanuska field, from Tunnel 4 of United States Navy Alaskan Commission investigating expidition, a prospect tunnel. Coal beds, C and D; Tertiary age, Chickaloon formation. The C bed was measured and sampled in the tunnel at one point by G. W. Salisbury on September 20, 1913, and the D bed at two points by G. W. Salisbury on October 18, 1913, at one point by G. E. Postma on October 5, 1913, and at one point by J. T. Ryan on September 1, 1913. The screened coal from the D bed was sampled September 25, 1913, by J. T. Ryan. Descriptions of the sections follow.

Section of C bed in Tunnel 4.

Laboratory No.	17915
	Ft. in.
Roof, gray shale.	
Coal	1 6
"Sulphur" streak	[a] 1
Coal	1 ½
Iron stone	[a] 6
Shale, carbonaceous	[a] 4
Floor, gray shale.	
Thickness of bed	3 5½
Thickness of coal sampled	2 6½

[a] Not included in sample.

Sample 17915 was cut 40 feet from the mouth of the tunnel.

Section of D bed in Tunnel 4.

Laboratory No.	18100
	Ft. in.
Roof, gray shale.	
Coal	1 3
"Niggerhead"	[a] 3
Coal	4
"Niggerhead"	[a] 2
Coal, clean	2 3
Floor, gray waxy shale.	
Thickness of bed	4 3
Thickness of coal sampled	3 10

[a] Not included in sample.

Sample 18100 was cut from the face of left crosscut, 150 feet from the mouth of Tunnel 4. The coal was wet when sampled. Sample 18097 represented only the lower 2 feet 3 inches of sample 18100. The coal was wet when sampled. Sample 18142 represented a hand-selected sample from a crosscut to the left of Tunnel 4 and counter

to Tunnel D. Sample 18318 represented the slack coal through a three-fourths-inch screen from D bed.

Tunnels D and 4 are connected underground.

Coal Creek. U. S. N. A. C. I. E. Tunnel A.

Analyses 17907, 18140, 18104, 18108, and 18139 (p. 27). Bituminous and semi-bituminous coal, Matanuska field, from Tunnel A of the United States Navy Alaskan Commission investigating expedition, a prospect tunnel on the west bank of Coal Creek, opposite cabin. Coal beds, Nos. 2, 7, and 8; Tertiary age, Chickaloon formation. The beds dip about 65° S. Samples were taken by J. T. Ryan and G. W. Salisbury as follows: At one point in No. 2 bed on October 22, 1913, at one point in No. 7 bed on November 25, 1913, and at three points in No. 8 bed on November 18 and 25, 1913, as described below:

Section of No. 2 coal bed in Tunnel A.

Laboratory No.	17907
	Ft. in.
Roof, igneous sill.	
Coal, clean and bright	8
Shale, soft	[a] 1
Coal, clean and bright	2 3
Carbonaceous shale and coal stringers	[a] 8
Coke and bony coal	[a] 2 0
Floor, waxy shale.	
Thickness of bed	5 8
Thickness of coal sampled	2 11

[a] Not included in sample.

Sample 17907 was cut from rib of gangway, 124 feet from mouth of the tunnel. The coal was wet when sampled.

Sample 18140 was cut from the rib along the tunnel and represented the upper 12 inches of No. 7 bed, a 21-inch bed. The roof was carbonaceous shale and bone, 17 inches thick. The floor was a gray sandy shale.

Sections of No. 8 coal bed in Tunnel A.

Section	A	B	C
Laboratory No.	18104	18108	18139
	Ft. in.	*Ft. in.*	*Ft. in.*
Roof, gray waxy shale.			
Coal, bright and clean	1 3	.. ..	.. ..
Shale	[a] 3	.. ..	.. ..
Coal, bright and clean	4 0	.. ..	.. ..
"Sulphur" streaks	[a] 5	.. ..	.. ..
Coal	10	.. ..	.. ..
"Sulphur" streaks	[a] 5	.. ..	.. ..
Coal	11	.. ..	.. ..
Sandy shale	[a] 10	[a] 1 0	.. ..
Coal, hard	10	2 11	2 11
Shale	[a] 7	[a] 1	[a] 1
Coal	1 0	[a] 1 1	[a] 1 1
Shale with streaks of coal	[a] 10	.. ..	.. ..
Carbonaceous shale	[a] 1 0	[a] 1 0	[a] 1 1
Floor, carbonaceous and gray shale.			
Thickness of bed	13 2	6 1	5 2
Thickness of coal sampled	8 10	2 11	2 11

[a] Not included in sample.

Section A (sample 18104) was cut from face of 1 gangway, 50 feet from its mouth. Section B (sample 18108) was cut along the rib of the tunnel. Section C (sample 18139) was cut from the best appearing part of the bed along the rib in the tunnel.

Beds Nos. 2, 7, and 8 are intersected by Tunnel A.

COAL CREEK. OUTCROP.

Analysis 18321 (p. 27). Bituminous coal, Matanuska field, from outcrop 1½ miles above mouth of Coal Creek on east bank. Coal bed, C; Tertiary age, Chickaloon formation. Sample 18321 was taken by J. T. Ryan on October 20, 1913. No further information available.

COAL CREEK. OUTCROP.

Analysis 18041, 18047, and 18103 (p. 27). Bituminous and semibituminous coal, Matanuska field, from outcrop on Coal Creek, near station 9–B of the United States Geological Survey. Coal bed, No. 3; Tertiary age, Chickaloon formation. The bed was sampled by J. T. Ryan on September 6 and October 21, 1913, as described below:

Sections of coal bed at outcrop on Coal Creek.

Section	A	B
Laboratory No.	18041	18103
Roof, black shale.	*Ft. in.*	*Ft. in.*
Coal clean and hard	4 3	.. ..
Shale and bone	[a] 7	6
Coal	6	4
Shale	[a] 4	½
Coal, clean and hard	1 11	1 1½
Shale	[a] 1	.. ..
Coal	4	.. ..
Floor, black shale.		
Thickness of bed	8 0	2 0
Thickness of coal sampled	7 0	2 0

[a] Not included in sample.

Section A (sample 18041) was cut from the outcrop at station 9–B of the United States Geological Survey; the weathered part was removed. Section B (sample 18103) was cut from exposed outcrop.

Sample 18047 was cut from the bed at the same place as sample 18041, but it represented only the 4 feet 3 inches of clean coal at the top of the section.

COAL CREEK. OUTCROP.

Analyses 18040 and 18094 (p. 27). Semibituminous coal, Matanuska field, from outcrop on Coal Creek. Coal bed, No. 2; Tertiary age, Chickaloon formation. The bed was sampled by J. T. Ryan in October, 1913, as described below:

Sections of coal bed outcrop at Coal Creek.

Section	A	B
Laboratory No.	18040	18094
Roof, shale.	*Ft. in.*	*Ft. in.*
Coal, clean and bright	2 6	6
Shale	½	[a] 1
Coal	1 1	1 0
"Niggerhead"	[a] 3½	.. ..
Coal	0½	.. ..
Sandstone, hard	[a] 5	.. ..
Coal, clean	7	.. ..
Floor, black shale.		
Thickness of bed	5 5½	1 7
Thickness of coal sampled	4 9	1 6

[a] Not included in sample.

Section A (sample 18040) was cut from the outcrop one-half mile below cabin, at station 19–B of the United States Geological Survey. A 4-foot cut was made in the coal to a point beyond the weathered part. Section B (sample 18094) was cut from the outcrop. No further information available.

COAL CREEK. OUTCROP.

Analyses 18092, 18109, 18320, and 18322 (p. 27). Semibituminous coal, Matanuska field, from outcrop on Coal Creek. Coal beds Nos. 4, 5, and 6; Tertiary age, Chickaloon formation. No. 6 bed was sampled at two points, No. 5 bed at one point, and No. 4 bed at one point by J. T. Ryan on October 22, 1913, as described below:

Section of No. 6 bed at outcrop on Coal Creek.

Section	A		B	
Laboratory No.	18109		18092	
Roof, gray shale.	*Ft.*	*in.*	*Ft.*	*in.*
Coal, hard, with cubical fracture	1	8	..	..
Coal, clean	4	0	..	..
Shale, irregular	[a]3	8	..	..
Coal, bright, clean, and soft	1	7	1	7
Igneous intrusion		[a]3		[a]3
Coke		6		[a]6
Coal, clean, bright and soft	2	3	2	3
Floor, not stated.				
Thickness of bed	13	11	4	7
Thickness of coal sampled	10	0	3	10

[a] Not included in sample.

Section A (sample 18109) was cut from the outcrop of the No. 6 bed. Section B (sample 18092) was cut seven-eighths mile above mouth of Coal Creek from the lower bench of the No. 6 bed.

Sample 18322 was taken from No. 5 bed 50 feet upstream from sample 18320, which was taken from No. 4 bed three-fourths mile above mouth of Coal Creek, on the east bank.

COAL CREEK. OUTCROP.

Analysis 17906 (p. 27). Semibituminous coal, Matanuska field, from outcrop about one-half mile below Coal Creek cabin. Coal bed, No. 1; Tertiary age, Chickaloon formation. The bed was measured and sampled by J. T. Ryan in September, 1913, as described below:

Section of No. 1 bed at outcrop on Coal Creek.

	Ft.	*in.*
Roof, gray shale.		
Coal, clean		4
Coal and shale		[a]10
Coal, bright		7
"Ironstone"		[a]½
Coal, bright and clean	2	1
Floor, not stated.		
Thickness of bed	3	10½
Thickness of coal sampled	3	0

[a] Not included in sample.

Sample 17906 was cut from the outcrop, 40 feet downstream from the outcrop of No. 2 bed. The bed which was concealed, was uncovered, and a 10-inch cut was made in the face. The sample had been exposed about one-half hour.

COAL CREEK. OUTCROP.

Analysis 18320 (p. 27). Semibituminous coal, Matanuska field, from outcrop, on Coal Creek, three-fourths of a mile above the mouth of the creek, on the east bank. Coal bed, No. 4; Tertiary age, Chickaloon formation. The sample was taken by J. T. Ryan in October, 1913. No further information available.

COAL CREEK. UNITED STATES NAVY ALASKAN COMMISSION INVESTIGATING EXPEDITION. PROSPECT DRIFT 1.

Analysis 18107 (p. 28). Semibituminous coal, Matanuska field, from prospect drift 1 of United States Navy Alaskan Commission investigating expedition. Coal bed, No. 1; Tertiary age, Chickaloon formation. The bed was sampled by J. T. Ryan on November 18, 1913, as described below:

Section of coal bed in drift 1.

	Ft.	in.
Roof, sandstone.		
Coal	2	4
Carbonaceous shale and coal		6
Floor, hard gray shale.		
Thickness of bed	2	10
Thickness of coal sampled	2	10

The sample was cut from the face, 16½ feet from the mouth of the drift. The coal was wet when sampled. The cover was 20 feet thick.

COAL CREEK. UNITED STATES NAVY ALASKAN COMMISSION INVESTIGATING EXPEDITION. PROSPECT DRIFT 2.

Analyses 18096 and 18102 (p. 28). Bituminous coal, Matanuska field, from prospect drift 2 of United States Navy Alaskan Commission investigating expedition. Coal bed, No. 4; Tertiary age, Chickaloon formation. The bed was sampled by J. T. Ryan on October 23, 1913, as described below:

Section of coal bed in drift 2.

Laboratory No.	18096	
	Ft.	in.
Roof, gray shale.		
Carbonaceous shale		2
Coal		4
Carbonaceous shale and coal		8
Coal, clean and bright	2	4
Floor, hard gray shale.		
Thickness of bed	3	6
Thickness of coal sampled	3	6

Sample 18096 was cut from the face of the drift, 43 feet from its mouth. The cover was 35 feet thick. Sample 18102 represented only the 2 feet 4 inches of clean bright coal at the bottom of the above section.

KINGS RIVER. OUTCROP.

Analyses 18137 and 18139, and natural-coke analyses 18136 and 18147 (p. 28). Bituminous coal, Matanuska field, from outcrops along banks of Kings River. Coal bed, No. 1; Tertiary age, Chickaloon formation. The bed was sampled by J. T. Ryan and G. W. Salisbury on September 15, 1913, as described on the following page.

Section of coal bed at outcrop on Kings River.

Laboratory No.	18137
	Ft. in.
Brown shale.	
Coal, bony	[a] 4
Coal, bright with a few thin bony partings	2 3
Shale	[a] 3
Coal, clean and bright	1 5
Coal, bony	1
Coal	11
Bony parting	Streak.
Coal	4
Coal and shale	[a] 8
Coal, clean and hard	1 0
Shale	[a] 1
Coal, clean and soft	2 2
Floor, not stated.	
Thickness of bed	9 6
Thickness of coal sampled	8 2

[a] Not included in sample.

Sample 18137 was cut from the outcrop on the west bank of Kings River below the lower bridge. Strike, N. 2° W.; dips 37° E.

Sample 18139 was cut from the outcrop on the west bank of the river, 600 feet below cabin.

Sample 18136 was cut from the outcrop on the east bank of the river, above the rock tunnel, at a point where an igneous sill divides the bed into two parts. The upper part was 4 feet 4 inches thick, divided as follows: Bony coal partly burned, 1 foot 6 inches; natural coke, 3 feet 10 inches. This sample represented the 3 feet 10 inches of natural coke.

Sample 18147 represented selected pieces of natural coke from the outcrop, 15 feet to the right of where sample 18136 was taken.

KINGS RIVER. OUTCROP.

Analysis 18151 (p. 28). Bituminous coal, Matanuska field, from outcrop on Kings River. Coal bed, No. 2; Tertiary age, Chickaloon formation. Bed strikes 2° W.; dips 37° E. The bed was sampled by J. T. Ryan on September 15, 1913, as described below:

Roof, brown shale.	*Ft. in.*
Shale and coal	[a] 1 2
Coal, clean	1 0
Coal and bone	5
Coal, clean	9
Shale	[a] 4
Coal, lower 6 inches high in "sulphur"	1 2
Bone	½
Coal, cubical fracture	2 6
Floor, gray and brown shale.	
Thickness of bed	7 4½
Thickness of coal sampled	5 10½

[a] Not included in sample.

Sample 18151 was cut from the outcrop of No. 2 bed, 13 feet above the outcrop of the No. 1 bed.

MATANUSKA RIVER. OUTCROP.

Analysis 18144 (p. 28). Bituminous coal, Matanuska field, from outcrop on the south bank of Matanuska River, 3 miles above the mouth of Chickaloon River. Coal bed unnamed; Tertiary age, Chickaloon formation. Bed 6 feet 6 inches thick; coal is badly crushed and contains several thin bone and shale partings; floor, gray shale, partly decomposed to clay. The sample was taken by J. T. Ryan and G. W. Salisbury on September 16, 1913. No further information available.

For geologic relations of this coal see U. S. Geol. Survey Bull. 500, 1912, p. 75.

PORT GRAHAM. OUTCROP.

Analysis 17489 (p. 28). Subbituminous coal, Kenai Peninsula field, from outcrop at Port Graham. Coal bed not named; Tertiary age, Kenai formation. The bed was sampled by G. W. Evans on June 2, 1913, as decribed below:

Section of coal bed in outcrop at Port Graham.

	Ft.	in.
Roof, sea beach.		
Bone		[a] 11
Shale, carbonaceous		[a] 5
Coal, blocky		8
Shale		[a] 2
Coal, blocky	1	8
Floor, concealed.		
Thickness of bed	3	10
Thickness of coal sampled	2	4

[a] Not included in sample.

NENANA FIELD.

IGLOO CREEK. OUTCROP.

Analysis 17794 (p. 29). Lignite, Nenana field, from outcrop on left bank of Igloo Creek about one-fourth mile above its junction with Healy Creek, which is about 6 miles above the junction of Healy Creek with the Nenana River. Lignite bed not named; Tertiary age, formation not named. Bed is about 8 feet thick; dips 40° to 45°; strikes southwest. The lignite is rather massive in character, showing little tendency to shaly structure. Sample 17794 was collected by J. A. Holmes on October 3, 1913, from an outcrop about 400 to 500 feet above the point where sample 17795 was collected. No further information available.

For geologic relations of this coal see U. S. Geol. Survey Bull. 501, 1912, pp. 57–59.

IGLOO CREEK. OUTCROP.

Analysis 17795 (p. 29). Lignite, Nenana field, from outcrop on left bank of Igloo Creek about one-fourth mile above its junction with Healy Creek, which is about 6 miles above the junction of Healy Creek with the Nenana River. Lignite bed not named; Tertiary age, formation not named. Bed, 12 to 15 feet thick; dips 40° to 45°; strikes southwest. Sample 17795 was collected by J. A. Holmes on August 26, 1913. It was taken from an outcrop 400 to 500 feet below where sample 17794 was collected. The lignite is more shaly than the outcrop from which sample 17794 was taken, but is fairly massive. No further information available.

For geologic relations of this coal see U. S. Geol. Survey Bull. 501, 1912, pp. 57–59.

HEALY CREEK. OUTCROP.

Analysis 17796 (p. 29). Lignite, Nenana field, from outcrop on left bank of Healy Creek about one-fourth mile above its junction with Igloo Creek. Coal bed unnamed; Tertiary age, formation not named. Bed 8 feet thick; dips 35° NW. Lignite rather massive and blocky, showing little shaly structure; from outcrop. Sample was cut by J. A. Holmes on August 26, 1913. No further information available.

For geologic relations of this coal see U. S. Geol. Survey Bull. 501, 1912, pp. 57–59.

NENANA RIVER. OUTCROP.

Analysis 23042 (p. 29). Lignite, Nenana field, from outcrop on west bank of Nenana River, 1½ miles below Lignite Creek. Lignite bed not named; Tertiary age. Roof, "cemented gravel"; floor, sandstone; dip, about 15° northwest. Exposure covered by high water. Sample 23042 was collected by Thomas Riggs, jr., on September 4, 1915, and was sealed in a tin can at Fairbanks on September 12. The sample was

taken from the upper part of the bed, of which about 5 feet was exposed above water. No further information available.

For geologic relations of this coal see U. S. Geol. Survey Bull. 501, 1912, pp. 54-60.

TATLANIKA RIVER. OUTCROP.

Analysis 17797 (p. 29). Lignite, Nenana field, from outcrop on right bank of Tatlanika River, about 6 miles below the mouth of Grubstake Creek. Lignite bed unnamed; Tertiary age. The bed was sampled at one point on the outcrop by J. A. Holmes on August 29, 1913. The sample did not represent the main body of the lignite, but only about 2 feet of shaly weathered material beginning 1 foot below the top and extending down 2 feet. The exposed part of the bed was 8 or 9 feet thick; the lower part was covered by flood-plain gravels at creek level.

YAKATAGA FIELD.

DUKTOTH VALLEY. OUTCROP.

Analysis 19345 (p. 29). Semibituminous coal, Yakataga field, from outcrop on the slope of Duktoth Valley, 200 feet above the valley floor and about 25 miles from the mouth of the Duktoth River. Coal bed, not named; Tertiary age. Roof and floor, shale. Strike, about N. 80° E.; dip, 35° N. The sample represents 4 feet of clean coal.

For geologic relations of this coal see U. S. Geol. Survey Bull. 592, 1914, p. 147.

ARKANSAS.

FRANKLIN COUNTY.

DENNING. DENNING NO. 2 MINE.

Analyses 18746, 18747, 18748, and 18749 (p. 29). Semibituminous coal, Arkansas field, from Denning No. 2 mine, a shaft mine 165 feet deep, one-half mile east of Denning depot, in sec. 22, T. 9 W., R. 26 W., on the St. Louis, Iron Mountain & Southern Ry. Coal bed locally known as the Denning at the Hartshorne horizon (probably identical with the Hartshorne coal of Oklahoma); Carboniferous (Allegheny) age, Spadra shale. Bed is 4 feet 3 inches thick; dips 1°; rolls and horsebacks occur infrequently. Roof, "draw slate" 1 to 18 inches thick; floor, shale; cover at points of sampling, about 200 feet. The bed was sampled by H. D. Mason, jr., on December 23, 1913, as described below:

Sections of coal bed in Denning No. 2 mine.

Section	A		B		C	
Laboratory No.	18746		18747		18748	
Roof, "draw slate."	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Coal	1	10	1	9	2	0
"Dirt band"		[a] 2		[a] 3		[a] 2
Coal	1	9	1	10	2	2
Floor, shale.						
Thickness of bed	3	9	3	10	4	4
Thickness of coal sampled	3	7	3	7	4	2

[a] Not included in sample.

Section A (sample 18746) was cut from the face 1 dip entry, 14 north, straight plane, 7,200 feet from the shaft. Section B (sample 18747) was cut from the face of 2 dip entry, 14 north, straight plane, 7,250 feet from the shaft. Section C (sample 18748) was cut from face 15 north, straight plane, 8,000 feet from the shaft.

The ultimate analysis of a composite sample made by combining equal amounts of samples 18746, 18747, and 18748 is given under laboratory No. 18749.

The mine is worked by the room-and-pillar system. In 1913 the coal was shot off the solid with black blasting powder and more powerful explosives. The output

was 700 tons per day, 5 per cent of which was shipped as run-of-mine. The screening plant consisted of bars 8 feet long with 1½-inch openings; about 40 per cent of the coal going to the screen passed through. Two pickers were employed on the cars. There were three loading tracks with a storage capacity for 40 empty and 30 loaded cars. The appearance of the coal loaded on the car was good. The capacity of the mine was 1,100 tons per day. The coal was all derived from advance work.

For descriptions and analyses of other samples of coal from this mine, see Bureau of Mines Bull. 22, 1913, pp. 48, 379, 380.

For geologic relations of this coal see U. S. Geol. Survey Bull. 326, 1907, p. 49.

LOGAN COUNTY.

PARIS. GRAND NO. 1 MINE.

Analyses 18750, 18751, 18752, and 18753 (p. 29). Semibituminous coal, Arkansas field, from Grand No. 1 mine, a shaft mine in the Paris district, 1 mile northeast of Paris depot on a spur of the Arkansas Central R. R. Coal bed known as the Paris; Carboniferous (Allegheny) age, Paris shale. Bed is 1,000 to 1,400 feet above the Hartshorne coal and 400 to 600 feet above the Charleston coal. Thickness, 25 inches; dip, 2° NW.; occasional rolls and horsebacks are encountered; roof, "draw slate"; floor, shale, generally soft; cover at points of sampling, 100 feet. The bed was sampled by H. D. Mason, jr., on December 13, 1913, as described below:

Sections of coal bed in Grand No. 1 mine.

Section	A	B	C
Laboratory No	18750	18751	18752
Roof, "draw slate."	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	4½	5	4¾
Coal, bony	¼	¼	¼
Coal	1 9	1 10	1 10
Floor, shale.			
Thickness of bed	2 1¾	2 3¼	2 3
Thickness of coal sampled	2 1¾	2 3¼	2 3

Section A (sample 18750) was measured at face of 3 east, main slope, 1,500 feet from the shaft bottom. Section B (sample 18751) was measured at face of 4 east, main slope, 1,900 feet from the shaft bottom. Section C (sample 18752) was measured at face of 18 room, 3 west, main slope, 1,700 feet southwest of shaft bottom.

The ultimate analysis of a composite sample made by combining samples 18750, 18751, and 18752 is shown under laboratory No. 18753.

The mine is worked on the room-and-pillar system. The coal was shot off the solid with black blasting powder, dynamite being used for brushing the roof and the floor. The coal was forked underground and the slack gobbed. A considerable proportion of the coal was wasted by this practice. The daily production was about 100 tons, all of which was screened over bars 12 feet long by 4½ feet wide with 1½-inch openings. About 15 per cent of the coal passed through. Particles of the roof and the floor did not mix with the coal in loading. There were two loading tracks, with a capacity of 10 empty and 10 loaded cars. Capacity of mine was 160 tons per day. About 40 acres of unmined coal remained tributary to this opening.

For geologic relations of this coal, see U. S. Geol. Survey Bull. 326, 1907, p. 49.

POPE COUNTY.

RUSSELLVILLE. BERNICE MINE.

Analyses 18755 and 18757 (p. 29). Semianthracite coal, Arkansas field, from Southern Anthracite No. 1 mine, a shaft mine, 455 feet deep, 2½ miles southwest of Russellville, on Dardanelle & Russellville R. R. Coal bed, Shinn Basin (on the Hartshorne horizon and may be identical with coal mined in the western part of the field at Hunt-

ington and Jenny Lind, Ark., and Hartshorne, Okla.); Carboniferous (Allegheny) age, Spadra shale. Bed averages 46 inches thick, dips 5°; rolls and horsebacks are frequent. Roof, "draw slate"; floor, hard blue shale. The bed was sampled in two parts at one point in the mine by H. D. Mason, jr., on January 4, 1914, as described below:

Sections of coal bed in Bernice mine.

Section	A	B
Laboratory No.	18755	18757
Roof, "draw slate."	Ft. in.	Ft. in.
Coal	9	[a] 9
Coal, dirty	[a] 8	8
Coal	2 1	[a] 2 1
Floor, shale.		
Thickness of bed	3 6	3 6
Thickness of coal sampled	2 10	8

[a] Not included in sample.

Samples 18755 and 18757 were cut from face of 10 room, 3 west entry, main west slope.

The mine is worked on the room-and-pillar system. In 1914 the coal was sometimes sheared but usually was shot off the solid with black powder. The fines were thrown into the gob. All of the coal loaded out was screened, making six different sizes: Grate, egg, No. 4, pea, slack, and buckwheat. There were three loading tracks, with a capacity of 10 empty and 10 loaded cars. Daily average production was 300 tons. Capacity of mine was 400 tons per day.

For descriptions and analyses of other samples of coal from this mine, see Bureau of Mines Bull. 22, pp. 49, 384.

For geologic relations of this coal, see U. S. Geol. Survey Bull. 326, 1907, pp. 49, 68.

SEBASTIAN COUNTY.

Hackett. Branner No. 2 Mine.

Analyses 18062 and 18063 (p. 30). Semibituminous coal, Arkansas field, from Branner No. 2 mine, a slope mine at Hackett, on the St. Louis & San Francisco and the Midland Valley Railroads. Coal bed, Hartshorne (Huntington); Carboniferous (Allegheny) age, Spadra shale. Thickness of seam, 2 feet 4 inches to 4 feet 6 inches; dips 11° SW.; occasional horsebacks are encountered. Roof, "draw slate" and shale; floor, soft shale; cover at points of sampling, 200 and 300 feet. The bed was sampled by H. D. Mason, jr., on October 20, 1913, as described below:

Sections of coal bed in Branner No. 2 mine.

Section	A	B
Laboratory No.	18062	18063
Roof, "draw slate" and shale.	Ft. in.	Ft. in.
Coal	.. ..	4
Rash parting	.. ..	[a] 8
Coal	3 6	2 6
Floor, shale.		
Thickness of bed	3 6	3 6
Thickness of coal sampled	3 6	2 10

[a] Not included in sample.

Section A (sample 18062) was cut from face of 22 room, 5 west level, 2,300 feet from pit mouth. Section B (sample 18063) was cut from face of 7 west level, main slope.

The coal is mined on the room-and-pillar system. In 1913 the coal was shot off the solid with black blasting powder. About 50 per cent of the coal was shipped as run-of-mine; the rest was screened on a screen 30 feet long by 8 feet wide with

⅝-inch and 3-inch openings; 60 to 70 per cent of the coal passed through the screen. Four pickers were employed at the cars and screen. The mined coal was fairly bright and did not weather rapidly. There were four loading tracks, with a capacity for 30 empty cars and 30 loaded cars. The average daily production was 400 tons.

JENNY LIND. JENNY LIND NO. 17 MINE.

Analysis 18267 (p. 30). Semibituminous coal, Arkansas field, from Jenny Lind No. 17 mine, a shaft mine 208 feet deep, in Bonanza-Jenny Lind district, 1½ miles southwest of Jenny Lind on the St. Louis, Iron Mountain & Southern Ry. Coal bed, Hartshorne; Carboniferous (Allegheny) age, Spadra shale. Bed is 6 feet thick; dips 8° SW.; faults and rolls are encountered infrequently. Roof, shale, 6 to 12 inches thick; floor, hard dark underclay; cover at point of sampling, 300 feet. The bed was sampled by H. D. Mason, jr., on November 28, 1913, as described below:

Section of coal bed in Jenny Lind No. 17 mine.

	Ft.	in.
Roof, black shale.		
Coal	2	2½
Soft blue shale band		[a] 2½
Coal	1	5
"Dirt band"		[a] 1
Coal	1	3
Floor, shale.		
Thickness of bed	5	2
Thickness of coal sampled	4	10½

[a] Not included in sample.

Sample 18267 was cut from face of 22 room neck, "U" entry, main slope, 6,500 feet from shaft.

The mine is worked on the room-and-pillar system. In 1913 the coal was shot off the solid, black powder, dynamite, and permissible explosives being used. Output was 675 tons per day, 25 per cent of which was shipped as run-of-mine. The screen consisted of bars 12 feet long with 1¼-inch openings; about 60 per cent of the coal screened passed through the openings. Two pickers were employed on the cars. There were three loading tracks, with a capacity of 30 empty and 30 loaded cars; maximum day's run, 837 tons; output to be increased to 1,000 tons.

For geologic relations of this coal, see U. S. Geol. Survey Bull. 326, 1907, p. 54.

COLORADO.

ELBERT COUNTY.

MATTISON. BARKER STRIP PIT.

Analysis 19902 (p. 30). Subbituminous coal, from Barker strip pit, in sec. 21, T. 10 S., R. 58 W., 4 miles east of Mattison on the Chicago, Rock Island & Pacific R. R. Coal bed, not named; Upper Cretaceous age, Laramie formation. Bed lies almost flat. It was sampled by M. R. Campbell on September 28, 1914, as described below:

Section of coal bed in Barker strip pit.

Laboratory No.	19902	
	Ft.	in.
Roof, not stated.		
Coal and carbonaceous shale	[a] 3	0
Coal, soft	[a] 2	0
Coal, hard	5	0
Coal, hard	[a] 4	0
Floor, not stated.		
Thickness of bed	[b] 14	0
Thickness of coal sampled	5	0

[a] Not included in sample.
[b] Thicknesses partly estimated as irregular walls prevented accurate measurements.

The sample was taken at the back of the pit. About 10 feet of cover had been removed where sample was cut. Coal slightly weathered.

GARFIELD COUNTY.

New Castle. Vulcan Mine.

Analyses 18366 and 18376 (p. 30). Bituminous coal, Grand Hogback field, from Vulcan mine, in the Glenwood Springs district, sec. 1, T. 6 S., R. 91 W., 2 miles east of New Castle, on the Colorado Midland Ry. Coal bed, Allen; Cretaceous age, Mesaverde formation. Average thickness, about 14 feet. Roof, weak sandstone; floor, sandy shale. The samples were taken by J. C. Roberts on December 22 and 30, 1913.

Sample 18366 was cut from the face of the east entry. The sample represented 8½ feet of coal, the thickness of the bed. The cover at this point was 350 feet thick. Sample 18376 was cut from the face of 23 room. The sample represented 12 feet of coal, the thickness of the bed. The cover at this point was 400 feet.

The coal is mined by the room-and-pillar system. In 1913, the bottom bench of about 6 feet was first mined, then the top bench was taken down and pillars removed. The coal was shipped as run-of-mine, except that delivered by wagons for domestic purposes. The coal loaded on wagons was screened over bars 12 feet long with 2-inch openings. There were three loading tracks with a capacity of 20 empty and 25 loaded cars. The daily output was about 150 tons. All the coal being mined was from advance workings.

For analyses and descriptions of other samples of coal from this mine, see Bureau of Mines Bull. 85, 1914, pp. 25, 168, 169.

For geologic relations of this coal see U. S. Geol. Survey Bull. 415, 1910, p. 112.

LA PLATA COUNTY.

Durango. Cinder Butte Mine.

Analysis 17747 (p. 30). Subbituminous coal, Red Mesa field, from Cinder Butte mine, in sec. 14, T. 32 N., R. 12 W., about 27½ miles southwest of Durango. Coal bed, B; Cretaceous age, "Laramie" formation. Roof, sandstone; floor, shale. The bed was sampled by M. A. Pishel, on August 5, 1913, as described below:

Section of coal bed in Cinder Butte mine.

	Ft.	in.
Roof, sandstone.		
Coal, bony	[a] 5	
Coal	8	
Shale	[a] 1	
Coal	[a] 3	
Bone	5	
Coal	5	
Coal, bony	9	
Bone	[a] 2	
Coal	1	10
Floor, shale.		
Thickness of bed	5	0
Thickness of coal sampled	4	11

[a] Not included in sample.

Sample 17747 was taken at the back of the opening.

Durango. Soda Spring Mine.

Analysis 17748 (p. 31). Bituminous coal, Red Mesa field, from Soda Spring mine, in sec. 1, T. 32, N., R. 12 W., about 25 miles southwest of Durango and 14 miles south of the Rio Grande Southern R. R. and 12 miles west of the Denver & Rio Grande R. R. Coal bed, "B"; Cretaceous (Montana) age, Mesaverde formation. Bed dips 13° SE. It was sampled on August 5, 1913, by M. A. Pishel, as described on the page following:

Section of coal bed in Soda Spring mine.

	Ft.	in.
Roof, not stated.		
Coal, bony	[a]2	6
Coal	2	10
Shale		[a]11
Coal	1	10
Bone		[a]1
Coal		8
Bone		[a]1
Coal		8
Bone	[a]2	1
Floor, not stated.		
Thickness of bed	11	8
Thickness of coal sampled	6	0

[a] Not included in sample.

The sample was taken in entry 100 feet west of the mine mouth.

HESPERUS. MORMON MINE.

Analysis 17745 (p. 31). Bituminous coal, Red Mesa field, from Mormon mine, in sec. 17, T. 33 N., R. 11, W., about 30 miles southwest of Durango and 12 miles south of Hesperus and 10 miles south of the Rio Grande Southern R. R. and 11 miles west of the Denver & Rio Grande R. R. Coal bed, not named; Cretaceous (Montana) age, Mesaverde formation. Thickness, 5 feet 5¼ inches. Roof, shale; floor, shale. The bed was sampled by M. A. Pishel on August 6, 1913, as described below:

Sections of coal bed in Mormon mine.

	Ft.	in.
Roof, shale.		
Coal		7
Shale		[a]½
Coal		7
Shale		¼
Coal, bony	1	9
Shale		[a]1
Coal		11
Shale		[a]½
Coal	1	5
Floor, shale.		
Thickness of bed	5	5¼
Thickness of coal sampled	5	3¼

[a] Not included in sample.

The sample was cut at the end of the entry, 50 feet from the mine mouth.

HESPERUS. WHEELER MINE.

Analysis 17855 (p. 31). Bituminous coal, Red Mesa field, from Wheeler mine, in sec. 31, T. 35 N., R. 11 W., 7½ miles southwest of Hesperus and 4 miles west of the Rio Grande Southern R. R. Coal bed, "Upper No. 5"; upper Cretaceous age, Mesaverde formation. Bed, 5 feet 7 inches thick; dips about 1° S. Roof, shale. The bed was sampled by M. A. Pishel on September 12, 1913, as described below:

Section of coal bed in Wheeler mine.

	Ft.	in.
Roof, shale.		
Coal	1	8
Bone		[a]1
Coal	3	0
Coal, bony		10
Floor, clay.		
Thickness of bed	5	7
Thickness of coal sampled	5	6

[a] Not included in sample.

The sample was cut near the end of the entry, 75 feet from the mouth of the mine.

MANCOS. HAUERT MINE.

Analysis 20268 (p. 31). Bituminous coal, Mesa Verde field, from Hauert mine, a drift mine in sec. 7, T. 35 N., R. 12 W., 6 miles southeast of Mancos on the Rio Grande Southern R. R. Coal bed, Spencer; Cretaceous age, Mesaverde formation. Bed 7 feet 5½ inches thick. Roof, black shale, 2 feet thick, which is overlain with 10 feet of sandstone. Floor, shale, 1 foot thick; beneath the shale is massive sandstone. The bed was sampled by A. J. Collier, on November 14, 1914, as described below:

Section of coal bed in Hauert mine..

	Ft.	*in.*
Roof, black shale, with thin streaks of coal.		
Coal	[a]1	4
Shale	[a]	10
Coal	1	1
Shale		½
Coal	1	2
Coal, bony		3
Coal	2	9
Floor, shale.		
Thickness of bed	7	5½
Thickness of coal sampled	5	3½

[a] Not included in sample.

The sample was taken at the face of an entry, 60 feet west of the mine mouth, under 15 feet of cover. The mine had not been in operation for two years, and the sample represented somewhat weathered coal.

MOFFAT COUNTY.

CRAIG. HART MINE.

Analysis 17782 (p. 31). Subbituminous coal, Yampa field, from Hart mine in T. 4 N. (not sectionized), R. 90 W., near the intersection of Hart Gulch and Waddle Creek, about 15 miles south and 1 mile west of Craig, the western terminus of the Denver & Salt Lake R. R. Coal bed, not named; Cretaceous age, Mesaverde formation. Bed dips 27° SW. Roof, shale, containing thin streaks of coal; floor, brown shale. The bed was sampled on September 22, 1913, by E. T. Hancock. The sample represented the entire thickness of the coal, 6 feet 9 inches. It was taken 100 feet northwest from the entry mouth. The coal was wet and weathered when sampled.

CRAIG. KIMBERLY MINE.

Analysis 17593 (p. 31). Subbituminous coal, Yampa field, from Kimberly mine, in sec. 32, T. 7 N., R. 90 W., three-fourths mile north of Craig on the Denver & Salt Lake R. R. Coal bed, not named; Cretaceous age, Laramie formation. The bed lies about 200 feet above the base of the Laramie. The bed was sampled on July 25, 1913, by E. T. Hancock. The sample was taken 120 feet from the mine mouth, and represented 7 feet 8 inches of coal. There was coal above the part sampled. The floor was black carbonaceous shale.

For geologic relations of this coal, see U. S. Geol. Survey Bull. 297, 1906, p. 62.

CRAIG. ROBY MINE.

Analysis 17840 (p. 31). Subbituminous coal, Yampa field, from Roby mine in T. 4 N. (not sectionized), R. 91 W., in deep gulch running northeast from Deer Creek; about 12 miles east of Axial and 16 miles south of Craig, the western terminus of the Denver & Salt Lake R. R. Coal bed, not named; Cretaceous age, Mesaverde formation. Roof, sandstone; floor, brown shale. The bed was sampled on September 24, 1913, by E. T. Hancock. The sample was taken 75 feet northwest from the opening and represented the entire thickness of the coal, 7 feet 1½ inches. The lower 1 foot 8½ inches was not of as good quality as the upper 5 feet 5 inches.

CRAIG. SEICK MINE.

Analysis 17592 (p. 31). Subbituminous coal, Yampa field, from Seick mine, in sec. 2, T. 7 N., R. 92 W., about 8 miles northwest of Craig, the western terminus of the Denver & Salt Lake R. R. Coal bed, not named; Tertiary (?) age, post Laramie formation. The bed dips about 5° N. It was sampled on July 24, 1913, by E. T. Hancock. The sample was taken in the entry 120 feet N. 80° E. from the opening and represented 5 feet 3 inches of coal. There was coal above the part sampled; the floor was brown shale. The bed at a point just outside of the entry measured 7 feet 6 inches of coal.

CRAIG. WALKER MINE.

Analysis 22725 (p. 31). Subbituminous coal, Yampa field, from Walker mine; in sec. 17, T. 6 N., R. 90 W., about 4 miles southeast of Craig on the Denver & Salt Lake R. R. Coal bed, not named; Cretaceous age, Mesaverde formation. The bed was sampled on August 8, 1915, by E. T. Hancock, as shown below:

Section of coal bed in Walker mine.

	Ft.	in.
Roof, sandstone.		
Shale, black, carbonaceous		[a] 1½
Coal	3	8
Sandstone		[a] ⅜
Coal	4	0
Bone		[a] 1½
Floor, sandstone.		
Thickness of bed	7	11⅜
Thickness of coal sampled	7	8

[a] Not included in sample.

The sample was taken 580 feet N. 55° W. from the mine mouth.

For analyses and descriptions of other samples of coal from this mine see Bureau of Mines Bull. 85, 1914, pp. 33, 186.

For geologic relations of this coal see U. S. Geol. Survey Bull. 297, 1906, p. 62.

CRAIG. BLEVINS MINE.

Analysis 17696 (p. 31). Subbituminous(?) coal, Yampa field, from Blevins mine; in sec. 28, T. 8 N., R. 93 W., 5 miles northeast of Lay, and about 16 miles west and 7 miles north of Craig, the western terminus of the Denver & Salt Lake R. R. Coal bed, not named; Tertiary(?) age, post Laramie formation. The bed was sampled on August 19, 1913, by E. T. Hancock, as follows:

Section of coal bed in Blevins mine.

	Ft.	in.
Roof, shale, 5 inches, under a soft sandstone.		
Shale, black, carbonaceous, containing streaks of coal		3½
Coal (good)	1	5
Shale, sandy parting		1
Coal, good	9	11½
Floor, clay shale.		
Thickness of bed	11	9

Where the bed has been mined recently the 1-inch parting forms the roof and there are only 7 feet 4 inches of the bed mined. Sample 17696 was taken from that portion of the bed recently mined. The sample was taken 140 feet N. 50° W. from the opening.

LAY. LAY MINE.

Analysis 17686 (p. 31). Subbituminous (?) coal, Yampa field, from Lay mine; in sec. 31, T. 7 N., R. 93 W.; 1½ miles southeast of Lay and about 18 miles west of Craig,

the western terminus of the Denver & Salt Lake R. R. No railroad connection. Coal bed, not named; Cretaceous age, Mesaverde formation. The bed was sampled August 21, 1913, by E. T. Hancock, as shown below:

Section of coal bed in Lay mine.

	Ft.	in.
Roof, clay shale.		
Coal, good	[a]	11½
Coal, containing thin streak of brown shale	[a]	5
Sandstone parting	[a]	1½
Coal, containing thin streak of brown shale	[a]	4
Coal, good	[a] 1	0
Shale, sandy, very persistent	[a]	1½
Coal, containing thin streaks of brown shale		6½
Coal, good	4	7
Shale, brown, containing thin streaks of coal	[a]	7
Coal, good	[a]	10
Coal, containing thin streaks of black carbonaceous shale	[a] 1	11
Floor, brown shale.		
Thickness of bed	11	5
Thickness of coal sampled	5	1½

[a] Not included in sample.

Sample 17686 was taken 270 feet south of the opening.

For geologic relations of this coal see U. S. Geol. Survey Bull. 297, 1906, pp. 63.

MONTEZUMA COUNTY.

CORTEZ. TODD MINE.

Analysis 20267 (p. 31). Bituminous coal, Mesa Verde field, from Todd mine, a drift mine in sec. 25, T. 35 N., R. 16 W., about 6 miles southeast of Cortez and 18 miles southwest of Mancos station on the Rio Grande Southern R. R. Coal bed, Spencer; Cretaceous age, Mesaverde formation. The bed dips about 2° S. Roof, shale; floor, sandstone. The bed was sampled by A. J. Collier on October 28, 1914. The sample was cut in room on left side of entry, 85 feet from mine mouth, and represented 3 feet 11 inches of coal, the entire thickness of bed.

For analyses and descriptions of other samples of coal from this mine see Bureau of Mines Bull. 85, pp. 33 and 189.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, p. 389.

MANCOS. FIELDING-SPENCER MINE.

Analysis 20499 (p. 31). Bituminous coal, Mesa Verde field, from Fielding-Spencer mine, in sec. 2, T. 35 N., R. 13 W., 2 miles southeast of Mancos, on the Rio Grande Southern R. R. Coal bed, Spencer; Cretaceous age, Mesaverde formation. Roof, shale; floor, sandy shale. The bed was sampled by O. B. Hopkins, on October 8, 1914. The sample was taken 400 feet from mine mouth, and represented 2¾ feet of coal, the entire thickness of the bed.

MANCOS. OLD SPENCER MINE.

Analysis 20498 (p. 31). Bituminous coal, Mesa Verde field, from old Spencer mine, in sec. 3, T. 35 N., R. 13 W., 2 miles southeast of Mancos, on the Rio Grande Southern R. R. Coal bed, Peacock; Cretaceous age, Mesaverde formation. Roof, sandstone; floor, sandy shale. This bed is not represented in other mines of the district. It has a massive sandstone roof 35 feet thick and requires little timber in mining, but it is variable in thickness, averaging about 2 feet 9 inches, but is said to thin out toward the east. The bed was sampled by O. B. Hopkins and A. J. Collier, on October 8, 1914. The sample was collected in a room on the north side, 700 feet east of the mine mouth, and represented 2 feet 4 inches of coal.

For analyses and description of other samples from the Old Spencer mine see Bureau of Mines Bull. 22, 1913, pp. 75 and 466. Sample 4225 mentioned there is probably from the Peacock bed.

MANCOS. SPENCER MINE.

Analysis 20500 (p. 31). Bituminous coal, Mesa Verde field, from Spencer mine, in sec. 3, T. 35 N., R. 13 W., 2 miles southeast of Mancos, on the Rio Grande Southern R. R. Coal bed, Spencer; Upper Cretaceous age, Mesaverde formation. Roof, shale; floor, sandstone. The bed was sampled by O. B. Hopkins and A. J. Collier, on October 9, 1914. The sample was taken in a room to the right of the entry, 500 feet east of the mine mouth, and represented 3 feet 1 inch of coal. The section included 6 inches of bony coal, which was excluded from the sample.

About 35 feet below the Spencer bed is the Peacock coal bed, 28 inches thick.

The daily output of the mine was about 6 tons.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, pp. 336.

ROUTT COUNTY.

HAYDEN. CAREY MINE.

Analysis 22775 (p. 32). Subbituminous coal, Yampa field, from Carey mine, in sec. 6, T. 5 N., R. 89 W., at north edge of Williams Fork Mountains, about 7 miles southwest of Hayden and 7 miles southeast of Craig, both on the Denver & Salt Lake R. R. Coal bed, not named; Cretaceous age, Mesaverde formation. The bed was sampled August 8, 1915, by E. T. Hancock, as shown below:

Section of coal bed in Carey mine.

	Ft.	In.
Roof, sandy shale.		
Bone	[a]	1½
Coal	5	1½
Sandstone	[a]	1
Coal		5½
Floor, brown shale.		
Thickness of bed	5	9½
Thickness of coal sampled	5	7

[a] Not included in sample.

This sample was taken in the entry, which is driven northeast, 140 feet from the mine mouth.

For geologic relations of this coal see U. S. Geol. Survey Bull. 297, 1906, pp. 53–54.

HAYDEN. DRY CREEK MINE.

Analysis 23024 (p. 32). Subbituminous coal, Yampa field, from Dry Creek mine, in sec. 4, T. 5 N., R. 88 W., on Dry Creek, about 5 miles south of Hayden, on the Denver & Salt Lake R. R. Coal beds not, named; Cretaceous age, Mesaverde formation. Bed dips 15° W. It was sampled October 3, 1915, by E. T. Hancock, as shown below:

Section of coal bed in Dry Creek mine.

	Ft.	In.
Roof, black carbonaceous shale.		
Coal	[a] 2	4
Sandstone, shaly	[a]	1½
Coal	7	8½
Floor, black carbonaceous shale.		
Thickness of bed	10	2
Thickness of coal sampled	7	8½

[a] Not included in sample.

The sample was taken 515 feet southwest of mine mouth.

For analyses and descriptions of other samples of coal from this mine see Bureau of Mines Bull. 22, 1913, pp. 80, 482.

For geologic relations of this coal see U. S. Geol. Survey Bull. 297, 1906, pp. 56-57.

MILNER. CURTIS NO. 1 MINE.

Analysis 22750 (p. 32). Bituminous coal, Yampa field, from Curtis No. 1 mine, in sec. 22, T. 6 N., R. 86 W., about 1 mile south of Yampa River, and 2 miles west of Trout Creek, and about 2 miles south of Milner on the Denver & Salt Lake R. R. Coal bed, Curtis; Cretaceous age, Mesaverde formation; dip, 20° NW. Roof, shale overlain by massive sandstone; floor, carbonaceous shale. The bed was sampled August 11, 1915, by M. R. Campbell and E. T. Hancock. The sample was taken in the mine at the face of the main slope, 270 feet from the mine mouth, and represented 4 feet 9½ inches of slightly weathered coal, the thickness of the bed.

For geologic relations of this coal see U. S. Geol. Survey Bull. 297, 1906, pp. 51–53.

MILNER. SCHUSTER MINE.

Analysis 22749 (p. 32). Bituminous coal, Yampa field, from Schuster mine, in sec. 9, T. 6 N., R. 86 W., on the north side of Yampa River, about half a mile west of Milner, near the Denver & Salt Lake R. R. Coal bed, not named; Cretaceous age, Mesaverde formation. The bed was sampled August 11, 1915, by M. R. Campbell and E. T. Hancock, as shown below:

Section of coal bed in Schuster mine.

	Ft.	in.
Roof, shale.		
Coal	3	4
Mineral charcoal		[a] ¾
Coal	1	9¾
Floor, carbonaceous shale.		
Thickness of bed	5	2½
Thickness of coal sampled	5	1¾

[a] Not included in sample.

The sample was taken at the face of the main entry, 250 feet from the mine mouth and consisted of weathered coal.

For geologic relations of this coal see U. S. Geol. Survey Bull. 297, 1906, pp. 51–53.

MOUNT HARRIS. BEAR RIVER MINE.

Analysis 22724 (p. 32). Bituminous coal, Yampa field, from Bear River mine, in sec. 11, T. 6 N., R. 87 W., about 2 miles east of Mount Harris on the Yampa River and the Denver & Salt Lake Railroads. Coal bed, not named; Cretaceous age, Mesaverde formation. Bed dips 8° W. It was sampled August 10, 1915, by E. T. Hancock, as shown below:

Section of coal bed in Bear River mine.

	Ft.	in.
Roof, carbonaceous shale.		
Coal	4	4
Coal, soft		7
Sandstone		[a] ½
Coal	4	3
Floor, sandy shale.		
Thickness of bed	9	2½
Thickness of coal sampled	9	2

[a] Not included in sample.

The sample was taken about 375 feet west of the mine mouth.

For geologic relations of this coal see U. S. Geol. Survey Bull. 297, 1906, pp. 64–68.

MOUNT HARRIS. COLORADO & UTAH NO. 1 MINE.

Analyses 22737, 22738, 22739, 22740 (p. 32). Bituminous coal, Yampa field, from Colorado & Utah No. 1 mine, in SW. ¼ SW. ¼ sec. 15, T. 6 N., R. 87 W., at Mount Harris on the Yampa River and the Denver & Salt Lake Railroads. Coal bed, Harris; Cre-

taceous age, Mesaverde formation. Roof, hard shale; floor, carbonaceous shale. The bed was sampled at three points in the mine, August 9 and 10, 1915, by M. R. Campbell and E. T. Hancock.

Sample 22737 was taken at the face of the main entry, 2,600 feet south from the mine mouth, and represented 9 feet of coal, the entire thickness of the bed. Sample 22738 was taken on the main dip entry, 1,700 feet southwest of the mine mouth, in 8 feet 5½ inches of coal.

Sample 22739 was taken at the face of the Hill entry, 800 feet southeast of mine mouth, in 7 feet 6 inches of coal.

The ultimate analysis of a composite sample made from samples 22737, 22738, and 22739 is shown under laboratory No. 22740.

The coal bed varies in thickness from 7 feet 6 inches to 9 feet at the places where sampled. The daily production of coal from this mine was 1,000 tons.

For geologic relations of this coal see U. S. Geol. Survey Bull. 297, 1906, pp. 64–68.

Mount Harris. International Mine.

Analysis 22736 (p. 32). Bituminous coal, Yampa field, from International mine, in sec. 15, T. 6 N., R. 87 W., half a mile northeast of Mount Harris and the Denver & Salt Lake R. R. Coal bed, Wolf Creek; Cretaceous age, Mesaverde formation. Dip, 8° W. Both roof and floor are carbonaceous shale. The bed was sampled August 10, 1915, by M. R. Campbell, in an air course, 300 feet from the mine mouth. The bed at the point sampled is 7 feet 2 inches thick, all of which was included in the sample.

For geologic relations of this coal see U. S. Geol. Survey Bull. 296, 1906, pp. 63–68.

ILLINOIS.

FRANKLIN COUNTY.

Buckner. No. 2 Mine.

Analyses 23473 to 23478 (p. 33). Bituminous coal, Illinois field, from No. 2 mine, a shaft mine one-half mile east of Buckner, on the Illinois Central R. R. Coal bed, No. 6 of the Illinois geological survey; carboniferous age, Carbondale formation. Bed is of uniform thickness, averages about 8 feet 6 inches. Roof is massive, brittle shale, which falls readily; floor is hard, smooth clay. Cover, about 550 feet. The bed was sampled by J. R. Fleming November 30, 1915, as described below:

Sections of coal bed in No. 2 mine.

Section	A	B	C	D	E
Laboratory No.	23473	23474	23475	23476	23477
Roof, brittle shale.	*Ft. in.*	*F. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Top coal [b]	[a] 1 2	[a] 1 4	[a] 1 6	[a] 1 4	[a] 1 4
Roof parting	Streak.	Streak.	Streak.	Streak.	Streak.
Coal, bright	3 6	.. ..	.. ..	3 5	1 5
Coal, bony	.. ..	.. ..	.. ..	.. ..	[a] 1
Coal, hard, bright	.. ..	.. ..	.. ..	.. ..	2 0
"Mother coal" and "sulphur"	[a] ¼	.. ..	.. ..	Streak.	[a] ½
Coal, hard, bright, and dull layers	2 5	5 4	4 4	2 3	1 4
"Mother coal" and bone	.. ..	.. ..	[a] ½	[a] 1½	[a] ¾
Coal, bright, brittle	.. ..	.. ..	9	3	5½
"Blue band" (carbonaceous shale)	[a] 1¾	[a] 2	[a] 3	[a] 1	1½
Coal, hard, bright	1 3	1 4	1 4½	11	1 3
Floor, clay.					
Thickness of bed	8 6	8 2	8 3	8 4½	8 11½
Thickness of coal sampled	7 2	6 8	6 5½	6 10	6 7

[a] Not included in sample. [b] Thickness estimated.

Section A (sample 23473) was measured at the face of the main east entry, 3,600 feet east of the shaft. Section B (sample 23474) was measured at the face of 5 south entry, main east entry, 3,000 feet southeast of the shaft. Section C (sample 23475) was measured at the face of 3 south entry, main east entry, 3,000 feet south of the shaft. Section D (sample 23476) was measured at the face of 27 room, 8 panel, 4 north entry, main west entry, 2,400 feet northeast of the shaft. Section E (sample 23477) was measured at the face of 6 panel, 3 north, main west entry, 1,900 feet north of the shaft.

The ultimate analysis of a composite sample made by combining equal portions of samples 23473, 23474, 23475, 23476, and 23477 is given under laboratory No. 23478.

The mine is opened by a shaft 555 feet deep and is worked on the room-and-pillar panel system. In 1915 the coal was undercut with electric chain breast machines and broken down with permissible explosives, 1 or 2 feet of coal being left for immediate roof, because of the weakness of overlying shale. About 10 per cent of the coal was shipped as run-of-mine; approximately 45 per cent of the screened coal passed a 2-inch screen. The tipple was equipped with shaker screens with seven different sizes of openings, ranging from three-fourths to 6 inches, which made it possible by combining the coal through the different screens to make a large variety of sizes for the market, the four principal sizes being 6-inch lump, 3 to 6 inch egg, 2 to 3 inch nut, and 2-inch slack. There were four loading tracks. None of the coal was washed or coked. The average production of the mine was about 4,000 tons, and was to be increased to 5,000 tons. The probable lifetime of the mine was 20 years.

Christopher. United No. 1 Mine.

Analyses 22686 to 22691 (p. 33). Bituminous coal, Illinois field, from United No. 1 mine, a shaft mine at Urbain, 1 mile east of Christopher, on the Eldorado branch of the Illinois Central R. R. The mine also has shipping connections with the Chicago & Eastern Illinois R. R. and the Chicago, Burlington & Quincy R. R. Coal bed, No. 6 of the Illinois geological survey; Carboniferous age, Carbondale formation. The coal is of firm character and uniformly thick, averaging 9 feet 5 inches. A "blue band" or dirt band, consisting of bone, shaly coal, or gray shale 18 to 30 inches above the floor, is found almost everywhere. The main roof is gray, impure shale, 15 to 110 feet thick, which falls readily when exposed. The immediate roof consists of 14 to 30 inches of coal of good quality. The floor is hard brittle clay of variable thickness. The shaft is 507 feet deep. The bed was sampled by H. I. Smith July 30 and 31, 1915, as described below:

Sections of coal bed in United No. 1 mine.

Sample	A	B	C	D	E
Laboratory No	22686	22687	22688	22689	22690
Roof, main, shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal left up in mining	(a)	(a)	(a)	(a)	(a)
Coal	9¼	1 11½	1 5¾	1 5½	11½
Coal, bony	¼	½	⅜	½	b1
Coal	.. ..	1 5½	.. ..	8¼	3½
"Sulphur"	.. ..	.. ..	.. ..	¼	b½
Coal	.. ..	.. ..	.. ..	.. ..	8
Coal, bony	.. ..	½	.. ..	.. ..	b2
Coal	3 5	1 3	4 1⅜	3 5	2 1
Gray coal	.. ..	7½	.. ..	.. ..	9
Coal, bony	c 3½	3	.. ..	.. ..	c ½
Coal	.. ..	.. ..	.. ..	.. ..	c 1
"Blue band"	c 3	c 8	c 4	c 3½	c 6½
Coal	.. ..	.. ..	.. ..	.. ..	3½
Coal, bony	.. ..	.. ..	.. ..	.. ..	½
Coal	1 8¾	1 3¼	1 5½	1 8½	1 3
Floor, clay.					
Thickness of coal mined	6 5¾	7 6¾	7 5	7 7½	7 3½
Thickness of coal sampled	5 11¼	6 10¾	7 1	7 3¾	6 4

a Not measured; estimated thickness 20 inches, seemingly coal of good quality.
b Soft "mother coal," not included in sample.
c Not included in sample.

Section A (sample 22686) was measured at the face of 19 room, 7 east panel, 8 southeast entry. Section B (sample 22687) was measured at the face of 6 room, 5 panel, 4 south entry. Section C (sample 22688) was measured at the face of 6 room, 2 west panel, 9 northeast entry. Section D (sample 22689) was measured at the face of 9 room, 8 panel, 8 southeast entry. Section E (sample 22690) was cut at face of 5 south entry, 250 feet south of 5 panel.

The ultimate analysis of a composite sample made by combining face samples 22686, 22687, 22688, 22689, and 22690 is given under laboratory No. 22691.

The mine is worked on a modification of the room-and-pillar system. In 1915 the coal, as a rule, was undercut with chain breast machines, and then snubbed and shot down with permissible explosives. The coal was sized on shaking screems of different sized openings, making possible a large number of sizes and combination of sizes. Pickers were employed on the cars. Screenings were not washed or coked. There were four loading tracks, with a capacity of 68 loaded and 68 empty cars. The average daily output of the mine was 2,500 tons.

Orient. Orient Mine.

Analyses 23442, 23443, and 23444 (p. 33). Bituminous coal, Illinois field, from Orient mine, a shaft mine at Orient, on a spur connecting with the Chicago, Burlington & Quincy and the Chicago & Eastern Illinois Railroads. Coal bed, No. 6 of the Illinois geological survey; Carboniferous age, Carbondale formation. Bed is of fairly uniform thickness, ranging from 7½ to 10 feet. Roof, massive shale, which falls readily when exposed; floor, medium hard, smooth clay. Shaft, 555 feet deep. The bed was sampled by J. R. Fleming November 24, 1915, as described below:

Sections of coal bed in Orient mine.

Section	A	B
Laboratory No.	23442	23443
Roof, shale.	*Ft. in.*	*Ft. in.*
Top coal (not sampled)	[a] 2 2	[a] 2 ½
Coal, brittle, alternating bright and dull lines	4 0	4 7
"Mother coal" and bone	[a] ½	[a] ½
Coal, brittle, lustrous	8	6½
"Blue band"	[a] 1	[a] 1
Coal, bright, brittle	2 1½	1 4
Parting streak	.. ..	Trace.
Coal, hard, bright	.. ..	1 2
Floor, clay.		
Thickness of bed	9 1	9 9½
Thickness of coal sampled	6 9½	7 7½

[a] Not included in sample.

Section A (sample 23442) was measured at the face of 4 east entry, main south entry, 1,500 feet south from the shaft. Section B (sample 23443) was measured at the face of the main west entry, 2,850 feet west from the shaft.

The ultimate analysis of a composite sample made by combining equal portions of samples 23442 and 23443, is given under laboratory No. 23444.

The mine is worked on the room-and-pillar panel system. In 1915 the coal was undercut with electric chain breast machines and broken down with permissible explosives. One to 2 feet of coal is usually left for roof because of the poor strength of the overlying shale. Practically none of the coal was shipped as run-of-mine. The tipple had shaker screens with seven different sizes of openings, ranging from three-fourths inch to 6 inches, which made it possible, by combining the coal through the different screens, to make a large variety of sizes for the market, the four principal sizes being 6-inch lump, 3 to 6 inch egg, 2 to 3 inch nut, and 2-inch slack. Approximately 45 per cent of the screened coal passed a 2-inch screen. The coal under 2 inches was rescreened. Loading booms were used to lower the coal into the cars to insure as little breakage as possible. Pickers were employed on the boom conveyors. None of the

coal was washed or coked. There were four loading tracks. The daily average production was about 3,600 tons, and was to be increased to 4,500 tons. The probable lifetime of the mine was 20 years.

ROYALTON. NORTH MINE.

Analyses 20080 to 20083, and 20723 to 20726 (p. 33). Bituminous coal, Illinois field, from North mine, a shaft mine, at Royalton. Coal bed, No. 6 of the Illinois geological survey; Carboniferous age, Carbondale formation. The coal is firm and is of uniform thickness, averaging 9 feet 5 inches. Roof, gray impure shale; usually 18 to 30 inches of coal is left for protection. Floor, hard, brittle clay. Shaft, 315 feet deep. The bed was sampled at three points in the mine by J. W. Paul, H. I. Smith, and G. T. Powell on November 1, 1914, and at three other points by H. I. Smith on November 30, 1914, as described below:

Sections of coal bed in North mine.

Section Laboratory No.	A 20080	B 20081	C 20082	D 20723	E 20724	F 20725
Roof, shale.						
Coal, 2 to 3 feet, left up in mining.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	4	3½	8½	7⅜	7	4½
Bone and "mother coal"	½	¼	¼	⅛	Streak.	1½
Coal	2	2½	3¾	2 10½	3 8	8
Bone and shale	¾	¼	¼	.. ..	*a* 4½	.. ..
Coal and "sulphur"	.. ..	.. ..	.. ..	*a* 2½	.. ..	.. ..
Coal	3 7¾	3½	1 1	8	.. ..	.. ..
Bone, shale, "mother coal"	½	¼	½	.. ..	.. ..	¼
Coal	3¾	.. ..	1	.. ..	.. ..	3 5½
Shale, carbonaceous	*a* 3	.. ..	.. ..	.. ..	.. ..	.. ..
"Mother coal"	.. ..	.. ..	½	.. ..	.. ..	.. ..
Coal	1 10½	4	3	.. ..	.. ..	.. ..
"Mother coal" and shale	.. ..	¼	⅛	.. ..	.. ..	.. ..
"Blue band"	.. ..	.. ..	.. ..	*a* 3	*a* 2½	.. ..
Coal	.. ..	11	2 3½	1 7¼	1 ½	.. ..
Bone	.. ..	.. ..	.. ..	.. ..	.. ..	*a* 1
Shale	.. ..	¼	.. ..	.. ..	.. ..	.. ..
Bone, coal, and "sulphur"	.. ..	.. ..	.. ..	.. ..	*a* 9	.. ..
Coal	.. ..	9½	.. ..	.. ..	.. ..	*a* 4
"Blue band"	.. ..	.. ..	.. ..	.. ..	.. ..	2
Shale	.. ..	Streak.	.. ..	.. ..	.. ..	.. ..
Coal	.. ..	1 6½	.. ..	.. ..	.. ..	1 9
Bone	½	.. ..	.. ..	.. ..	.. ..	.. ..
Coal	.. ..	3¼	.. ..	.. ..	.. ..	.. ..
Shale, carbonaceous	.. ..	2	1	.. ..	.. ..	.. ..
Coal	.. ..	2 0	1 9	.. ..	.. ..	.. ..
Floor, clay.						
Thickness of coal mined	6 8¾	6 11½	6 8⅛	6 2¾	6 7½	6 11¾
Thickness of coal sampled	6 5¾	6 9½	6 7⅛	5 9¼	5 3½	6 4¾

a Not included in sample.

Section A (sample 20080) was measured at face of 4 north entry, 2 main west entry. Section B (sample 20081) was measured at face of 27 room, 1 north entry, 1 main east entry. Section C (sample 20082) was measured at face of 1 main east entry, main north entry. Section D (sample 20723) was measured at face of 2 west south entry, about 2,000 feet west of the shaft. Section E (sample 20724) was measured at face of 26 room, 3 southwest entry, near entry. Section F (sample 20725) was measured at face of 1 east south entry.

The ultimate analysis of a composite sample made by combining face samples 20080, 20081, and 20082 is shown under laboratory No. 20083. The ultimate analysis of another composite sample made by combining face samples 20723, 20724, and 20725 is shown under laboratory No. 20726.

A modified panel, room-and-pillar system of mining, with cross entries, is used. From the shaft bottom double main entries extend at right angles north, south, east, and west for average distances of 3,000 feet, thus dividing the mine into four quadrants. In 1914 the coal was undercut by machines, and shot down with black blasting

powder. All shooting was done by shot firers after the miners were out of the mine. Very little pillar robbing had been done. The average daily production was about 2,600 tons.

West Frankfort. West Frankfort No. 1 Mine.

Analyses 22915 to 22921 (pp. 33-34). Bituminous coal, Illinois field, from West Frankfort No. 1 mine, a shaft mine on the west border of West Frankfort, on the Chicago & Eastern Illinois and the Chicago, Burlington & Quincy Railroad. Coal bed, No. 6 of the Illinois geological survey; Carboniferous age, Carbondale formation. Thickness as mined, 6½ to 8¼ feet. The main roof is massive shale which falls readily. In mining, 18 to 24 inches of coal of good quality is left up to protect shale. The floor is soft underclay with a rough surface and heaves when wet. Shaft, about 450 feet deep. The bed was sampled by H. I. Smith and G. T. Powell August 3, 1915, as described below:

Sections of coal bed in West Frankfort No. 1 mine.

Section	A		B		C		D		E		F	
Laboratory No.	22915		22916		22917		22918		22919		22920	
Roof, shale.												
Coal not mined, 1.5 to 2 feet.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Coal	4	3	3	6	1	5	3	0	2	7	1	9½
Bony coal to "mother coal"	..	..		½	*a*	1		½		¼		½
Coal	..	..		8½	2	10		2¾		8½	3	5
Coal, bony		½		½		½		¾		¼		1
Coal		7		8		7	1	5	1	4¾		7½
"Blue band" (carbonaceous)		½	*a*	2	*a*	1	*a*	1	*a*	1¼	*a*	¾
Coal		11½		9¼	1	9½	1	9½	1	10½	2	2
"Sulphur"	Streak.			¼	..	..	..	..	..	..	..	..
Coal		9	1	1	..	..	..	..	..	..	..	..
Floor, underclay.												
Thickness of coal mined	6	7½	7	0	6	10	6	7½	6	8½	8	2¼
Thickness of coal sampled	6	7½	6	10	6	8	6	6½	6	7¼	8	1½

a Not included in sample.

Section A (sample 22915) was measured at face of 1 southwest entry, about 100 feet inby 4 east entry. Section B (sample 22916) was measured at face of 1 northeast entry, 60 feet inby 6 west entry. Section C (sample 22917) was measured opposite 15 room neck, at face of 4 west entry, 2 southwest entry. Section D (sample 22918) was measured at face of main west entry, about 1,000 feet from 2 north entry and 2 southwest entry. Section E (sample 22919) was measured at face of 2 main north entry, 60 feet inby 6 west entry. Section F (sample 22920) was measured at face of 11 room, 30 feet from 3 east entry, 2 northeast entry.

The ultimate analysis of a composite sample made by combining equal parts of face samples 22915 to 22920, inclusive, is given under laboratory No. 22921.

The room-and-pillar system of mining is used. In 1915 the coal was undercut by machines and broken down with permissible explosives; shotfirers were employed. The usual sizes of coal produced were lump over 6 inches, egg between 3 and 6 inches, nut between 2 and 3 inches, and screenings through 2 inches. About 43 per cent of the coal going to the screens passed through. No pickers were employed on the cars. There were 4 loading tracks. The average daily output was 1,800 tons, which was to be increased to 2,500 tons.

GALLATIN COUNTY.

Shawneetown. Country Bank.

Analysis 23424 (p. 34). Bituminous coal, Illinois field, from a Country bank, in sec. 35, T. 10 S., R. 9 E., 8 miles southwest of Shawneetown, on the Louisville & Nashville and Baltimore & Ohio R. R. Coal bed, Lower Davis or "Four-Foot" seam of Saline mines; Carboniferous age, Carbondale formation. The bed was sampled

at a point 200 feet north of the mouth of slope by Wallace Lee on November 20, 1915, as described below:

Section of Lower Davis or "Four-Foot" seam at Country bank, 8 miles southwest of Shawneetown.

Laboratory No.	23424	
Roof, black shale, with "sulphur."	*Ft.*	*in.*
"Rash"		[a] ½
Coal with "mother-coal" partings	1	11
"Mother coal"		¼
Coal		5
"Mother coal"		¼
Coal, with "sulphur"	1	6
Floor, not stated.		
Thickness of coal measured	3	11
Thickness of coal sampled	3	10½

[a] Not included in sample.

SHAWNEETOWN. SALINE MINES.

Analysis 23425 (p. 34). Bituminous coal, Illinois field, from middle mine of Saline mines, in sec. 27, T. 10 S., R. 9 E., 6 miles southwest of Shawneetown, on the Louisville & Nashville and the Baltimore & Ohio R. R. Coal bed, Springfield or No. 5 of the Illinois geological survey; Carboniferous age, Carbondale formation. Bed 5 feet thick. Roof, black shale; floor, clay. The bed was sampled by Wallace Lee on November 21, 1915, at a point 300 feet east of the mouth of the slope, as described below.

Section of No. 5 bed in Saline mines.

Roof, black shale.	*Ft.*	*in.*
Coal with "mother-coal" parting	3	8
"Sulphur"		⅛
Coal		½
"Sulphur"		⅛
Coal		5¼
Coal with "sulphur"		[a] 1
Coal		9
Floor, clay.		
Thickness of bed	5	0
Thickness of coal sampled	4	11

SHAWNEETOWN. STRONG MINE.

Analysis 23426 (p. 34). Bituminous coal, Illinois field, from Strong mine, in sec. 9, T. 10 S., R. 9 E., 4 miles southwest of Shawneetown, on the Louisville & Nashville and the Baltimore & Ohio Railroads. Coal bed, Herrin or No. 6; Carboniferous age, Carbondale formation. Bed 3½ feet thick. The bed was sampled by Wallace Lee on November 22, 1915, at a point 400 feet northwest of the slope mouth, as described below.

Section of No. 6 bed in Strong mine.

Roof, black shale.	*Ft.*	*in.*
Coal		6
"Sulphur"		¼
Coal	2	0
"Sulphur"		¼
Coal		2
"Blue band"		[a] 1⅜
Coal		2½
"Sulphur"		[a] ¾
Coal		2
Coal with "sulphur streak"		2½
Floor, clay.		
Thickness of bed	3	6
Thickness of coal sampled	3	3½

[a] Not included in sample.

MACOUPIN COUNTY.

GILLESPIE. SUPERIOR NO. 1 MINE.

Analyses 18545, 18546, 18553, and 18910 (p. 34), bituminous coal, Illinois field, from Superior No. 1 mine, a shaft mine 2½ miles southwest of Gillespie, on the Chicago & Northwestern R. R. Coal bed, Herrin coal (Belleville, No. 6) of the United States Geological Survey; Carboniferous age, Carbondale formation. The bed was sampled by J. T. Ryan and H. C. Porter on January 24, 1914, as described below.

Sections of coal bed in Superior No. 1 mine.

Section	A		B	
Laboratory No.	18545		18546	
Roof, shale.	*Ft.*	*in.*	*Ft.*	*in.*
Coal	..	..		3
"Mother coal"	..	..		½
Coal, with "sulphur" streaks	3	0		11½
"Sulphur" and shale parting		¼		[a] 1
Coal		7	[b] 1	4½
"Sulphur" parting		[a] ½		[a] ½
Coal		9	1	0
"Sulphur" parting		[a] ⅜		¼
Coal	1	5	1	2
"Blue band"		[a] ½		[a] 1
Coal	[b] 2	1½	1	5½
Floor, underclay.				
Thickness of bed	8	⅛	6	5¾
Thickness of coal sampled	7	10¾	6	3¼

[a] Not included in sample. [b] Contained thin "sulphur" partings.

Section A (sample 18545) was cut from face of 11 room, 3 south entry, 5 east south entry. Section B (sample 18546) was cut from face of 1 room, 1 south entry, 5 east north entry.

The ultimate analysis of a composite sample made by combining an equal amount of samples 18545 and 18546 is shown under laboratory No. 18553.

Sample 18910 represented a car of run-of-mine coal, sampled by E. R. Linkenhoker as it was being unloaded at the Pittsburgh testing station of the Bureau of Mines on March 21, 1914.

This car of coal was used for a steaming test (Pittsburgh test No. 454).

MONTGOMERY COUNTY.

PANAMA. SHOAL CREEK NO. 1 MINE.

Analyses 21901 to 21906 (p. 35). Bituminous coal, Illinois field, from Shoal Creek No. 1 mine, a shaft mine at Panama, on the Toledo, St. Louis & Western R. R. Coal bed, Herrin coal (Belleville, No. 6); Carboniferous age, Carbondale formation. The bed is 5 feet 10 inches to 7 feet thick, and lies practically flat. The main roof is shale; 6 to 8 inches of coal are left up in mining. The floor is soft clay. The shaft is 381 feet deep. The bed was sampled by H. I. Smith, J. R. Fleming, and G. T. Powell April 10, 1915, as described on page following.

Sections of coal bed in Shoal Creek No. 1 mine.

Section	A		B		C		D		E	
Laboratory No.	21901		21902		21903		21904		21905	
Roof, shale.										
Coal, 4 to 8 inches, left up in mining.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Coal, hard, bright	1	0		6	1	5		2		8
"Sulphur" band		[a] ½		Streak.		[a] ½		[a] ½	[a]	Streak.
Coal, hard, bright	1	9		6	1	3	1	4½		8
"Sulphur"		[a] ¼		[a] ½		[a] ½		[a] ¼		[a] ½
Coal, hard, bright	2	0		10½	1	2	1	8	2	9
"Sulphur" and bony coal		[a] 2		1½		[a] 1		[a] ¼		[a] ½
Coal, soft		2	..	..	..	..	..	..	..	..
Coal	..	..	1	9	..	..		6	..	..
Coal, hard, bright	..	..	..	..		8	..	..		9
"Blue band" shale		[a] 1	..	..		[a] 3		1		[a] 1
"Sulphur"	..	..	Streak.		..	..	..	..	..	..
Coal	..	..	..	..	..	..		[a] 2¼	..	..
"Blue band"	..	..	..	..	..	..		[a] ½	..	..
Coal	..	..	..	..	..	..		[a] 1	..	..
"Sulphur"	..	..	..	..	..	..		[a] 1	..	..
Coal, somewhat dull	..	..		2	..	..	..	..	1	3
Coal, streaked with shale		7	..	..	..	..	..	..	..	..
"Sulphur"	..	..	Streak.		..	..	..	..	..	..
Coal	..	..		4¼		11	1	0	..	..
"Sulphur"	..	..	Streak.		..	..	..	..	..	..
"Blue band"		[a] 1½	..	..	..	..	..	..	..	..
Coal	..	..		10	..	..	..	..	..	..
"Blue band"	..	..		[a] ½	..	..	..	..	..	..
Coal		3	1	2	..	..	..	..	..	..
Floor, clay.										
Thickness of bed	6	2	6	4	5	10	5	2¾	6	3
Thickness of coal sampled	5	9	6	3¼	5	5	4	9¼	6	1

[a] Not included in sample.

Section A (sample 21901) was cut from face of 15 room neck, 7 south stub entry, 7 east south entry. Section B (sample 21902) was cut from face of 9 west north entry, 150 feet inby back north main entry. Section C (sample 21903) was cut from face of 5 south stub entry, 7 east south entry. Section D (sample 21904) was cut from face of 10 east north entry, 200 feet inby 2 north stub entry. Section E (sample 21905) was cut from face of 1 north stub entry, 7 east south entry.

The ultimate analysis of a composite sample made by combining face samples 21901, 21902, 21903, 21904, and 21905 is shown under laboratory No. 21906.

The room-and-pillar panel system of mining is used. In 1915 the coal was undercut with machines and was shot down with permissible explosives. A shaking screen was used, having 2, 3, 6, and 8 inch holes. Forty per cent of the screened coal passed through the 3-inch screen. The coal passing this screen was sent to the washery. Five sizes of coal were produced in washing. The output was about 2,600 tons per day, half of which was from advance workings.

PEORIA COUNTY.

Bartonville. Collier Mine.

Analyses 21032, 21033, 21034, and 21035 (p. 35). Bituminous coal, Illinois field, from Collier mine, a shaft mine at Acme station, 1 mile west of Bartonville, on the Peoria Terminal Ry. Coal bed, No. 5 of the Illinois geological survey; Carboniferous age, Carbondale formation. Bed is fairly uniform, being about 4 feet 3 inches thick. A few horsebacks and no rolls or faults had been encountered at the time of sampling. The roof is dark shale about 10 feet thick, above which is a limestone cap rock, having irregular undersurface. The floor is brittle underclay. Shaft, 120 feet deep.

The bed was sampled on February 15, 1915, by H. I. Smith, as shown below:

Sections of coal bed in Collier mine.

Section Laboratory No.	A 21032	B 21033	C 21034
Roof, dark shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal, conchoidal fracture	5	7	6
Coal, rough fracture	3 7	1 1	3 7
Coal and "sulphur"	[a] 1	[a] 1/2	1/2
Coal	.. ..	2 6 3/4	.. ..
Floor, brittle clay.			
Thickness of bed	4 1	4 3	4 1 1/2
Thickness of coal sampled	4 0	4 2 3/4	4 1 1/2

[a] Not included in sample.

Section A (sample 21032) was cut at face of 6 north entry, main west entry. Section B (sample 21033) was cut at face of 1 room, 4 north entry, inby 3 north parting. Section C (sample 21034) was cut at face of 5 north entry, main west entry.

The ultimate analysis of a composite sample made by combining face samples 21032, 21033, 21034 is shown under laboratory No. 21035.

The mine is worked on the room-and-pillar system. At the time of sampling the coal was shot off the solid with black blasting powder. The shots were fired by shot firers when all the men were out of the mine except the entry men. One-third of the output was shipped as "run-of-mine;" 1¼-inch screens were used.

This was a small mine, and was being worked on a cooperative basis. The tracks had a capacity of 10 empty cars and 20 loaded cars. The average daily output of the mine was 235 tons. There were 85 acres to be mined.

Hanna City. Hanna City Mine.

Analyses 22982 to 22986 (p. 35). Bituminous coal, Illinois field, from Hanna City mine, a shaft mine at Hanna City, on the Minneapolis & St. Louis R. R. Coal bed, No. 5 of the Illinois geological survey; Carboniferous age, Carbondale formation. Thickness, about 3 feet 4 inches. Roof gray hard shale about 2 feet 6 inches thick; floor, underclay 3 to 5 feet thick. Shaft, 240 feet deep. The bed was sampled by J. R. Fleming October 4, 1915, as described below:

Sections of coal bed in Hanna City mine.

Section Laboratory No.	A 22982	B 22983	C 22984	D 22985
Roof, shale, 2½ feet.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal, bony	[a] 6	.. ..	.. ..	[a] 6
Coal, bright	1 6	1 0	3 3	1 0
"Sulphur" to "mother coal"	Streak.	[a] 1/2	.. ..	Streak.
Coal, hard	1 4	2 3 3/4	.. ..	1 10
Floor, underclay.				
Thickness of bed	3 4	3 4	3 3	3 4
Thickness of coal sampled	2 10	3 3 3/4	3 3	2 10

[a] Not included in sample.

Section A (sample 22982) was measured at face of 2 north entry, 6 west entry, main north entry, 3,500 feet from the shaft. Section B (sample 22983) was measured at face of 1 north entry, 6 east entry, main north entry, 3,200 feet from the shaft. Section C (sample 22984) was measured at face of 5 room, 1 south entry, 6 east entry, main north entry, 2,500 feet from the shaft. Section D (sample 22985) was measured at face of 6 west entry, main north entry, 3,400 feet from the shaft.

The ultimate analysis of a composite sample made by combining equal parts of face samples 22982 to 22985 is shown under laboratory No. 22986.

The mine is worked on the room-and-pillar system. In 1915 the coal was undercut with electric breast-chain machines, and shot down with black blasting powder. Capacity of mine, 700 tons per day; average output, 600 tons.

PERRY COUNTY.

Du Quoin. Majestic Mine.

Analyses 20728 to 20734 (p. 35). Bituminous coal, Illinois field, Majestic mine, a shaft mine 5 miles east of Du Quoin and one-half mile from the Eldorado branch of the Illinois Central R. R. Coal bed, No. 6 of the Illinois geological survey; Carbonaceous age, Carbondale formation. Bed 11 feet 6 inches thick. The main roof is weak shale; in mining, 2¼ to 3 feet of coal is left up. The floor is soft underclay. The coal has an indistinct cleat, and the characteristic "blue band." Faults are sometimes encountered in mining. The bed was sampled by H. I. Smith on October 2, 1915, as shown below:

Sections of coal bed in Majestic mine.

Section	A		B		C		D		E		F	
Analysis No.	20728		20729		20730		20731		20732		20733	
Roof shale.												
Coal, 3 feet, left up in mining.												
Coal		5		10		8½		7		12		8
Shale and bone	..	..	..	..	Streak.		..	..	Streak.			½
Coal		10¾	1	1		11¾		10½	3	5½	1	8
"Mother coal" and shale		⅛	..	..		¾		¼	..	..		¼
Coal	..	..	..	..		7½	..	..	..	..	..	..
Coal, bony	..	..	..	¼		¼	..	..		2	..	..
Coal		9½	..	..	1	2	1	9		5		7
Bone, "mother coal," "sulphur"		½		¾		½		½		a ½		¼
Coal		10½	3	1¾		8½	1	9		a 2		8½
Shale and "mother coal"		¼		a 1		a ¾		a ½		a ½		¼
Coal		11		a 2		a 1½		a 2		a 1½		8½
"Blue band"	..	..		a 2½	..	..		a 2		a 1	..	..
"Mother coal" and bone		½	..	..		a ½	..	..	..	..	..	..
Coal		9	1	9½	..	..	1	10		8½	..	..
Shale		a 1	..	..	..	..	..	..	..	..		a 1
Coal		a 2	..	..		a 1	..	..	..	..		a 2
Shale		a 1½	..	..	..	..	..	..	..	..	..	..
"Blue band"	..	..	..	..		a 1	..	..	..	..		a 1
Coal		10½	..	..	1	3	..	..	..	..	1	2½
"Mother coal"		½	..	..	..	..	..	..		½	..	..
"High-sulphur" coal	..	..	..	..		8	..	..	..	..		7
Coal		8½	..	..	..	..	..	..		7½	..	..
Floor, soft clay.												
Thickness of bed	6	8½	7	4½	6	7	7	3½	6	10½	6	6¾
Thickness of coal sampled	6	4	6	11	6	2½	6	8	6	5	6	2¾

a Not included in sample.

Section A (sample 20728) was measured at 38 room neck, face of 6 southwest entry 2,450 feet southwest of shaft. Section B (sample 20729) was measured at the face of 11 southeast entry, 20 feet inby 5 west entry, 2,900 feet southeast of shaft. Section C (sample 20730) was measured at the face of main east entry, about 50 feet inby 11 and 12 north entries, 2,830 feet east of shaft. Section D (sample 20731) was measured at the face of 3 northwest entry, 800 feet west and 3,100 feet north of shaft. Section E (sample 20732) was measured at the face of 13 room, 8 northwest entry, 2,150 feet west and 700 feet north of shaft. Section F (sample 20733) was measured at the face of 9 north entry, main east entry, 20 feet inby 28 room.

The ultimate analysis of a composite sample made by combining face samples 20728, 20729, 20730, 20731, 20732, and 20733 is shown under laboratory No. 20734.

The room-and-pillar system of mining is used. At the time of sampling the coal was undercut with machines and was shot down with black blasting powder by shot firers after the miners were out of the mine. About 15 per cent of the coal was shipped as "run-of-mine" and the remainder was screened over 6, 3, 2, and 1½ inch screens. There were four loading tracks with a capacity of 100 empty and 50 to 60 loaded cars. The output of mine was about 2,500 tons per day, and there was about 1,080 acres still to be mined.

VERMILION COUNTY.

WESTVILLE. BUNSEN MINE.

Analysis 25413 (p. 35). Bituminous coal, Illinois field, from Bunsen mine, at Westville. Coal bed, No. 6 of the Illinois geological survey; Carboniferous age, Carbondale formation. Sample 25413 represented a car of nut coal. Sampled at the Pittsburgh plant of the Bureau of Mines on June 20, 1916, by E. R. Linkenhoker.

WILLIAMSON COUNTY.

HERRIN. C. & H. MINE.

Analysis 19714 (p. 36). Bituminous coal, Illinois field, from C. & H. mine, at Herrin. Coal bed, No. 7 of the Illinois geological survey; Carboniferous age, Carbondale formation. Sample 19714 represented a carload of 2-inch lump coal from this mine. The sample was taken by E. R. Linkenhoker, on July 25, 1914, while the coal was being unloaded at the Pittsburgh experiment station of the Bureau of Mines.

HERRIN. JEFFREY MINE.

Analyses 17719, 17720, and 17721 (p. 36). Bituminous coal, Illinois field, from Jeffrey mine, a shaft mine in the Big Muddy district, near Herrin. Coal bed, Herrin (Belleville, No. 6) of the United States Geological Survey; Carboniferous age, Carbondale formation. Bed is 8 to 10 feet thick, 6 to 7 feet of which is mined. The bed was sampled by R. Y. Williams on August 12 and 13, 1913, as described below:

Sections of coal bed in Jeffrey mine.

Section	A		B		C	
Laboratory No.	17719		17720		17721	
Roof, not stated.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Coal, hard and bright	1	2	7	1	6	8
"Sulphur"		½	..	..	..	..
Coal, hard and bright	5	4	..	..	..	..
"Blue band"		1¼		1		¼
Coal, hard and bright	1	10	1	11	2	4
Floor, not stated.						
Thickness of bed	8	5¾	9	1	9	¼
Thickness of coal sampled	8	5¾	9	1	9	¼

Section A (sample 17719) was taken at face of 13 room, 8 east entry, main south entry, 3,000 feet southeast of shaft. Section B (sample 17720) was taken at face of 42 room, 1 west entry, main south entry, 1,800 feet southwest of shaft. Section C (sample 17721) was taken at face of 18 room, 3 west entry, main north entry, 1,500 feet northwest of shaft.

INDIANA.

GIBSON COUNTY.

FORT BRANCH. FORT BRANCH MINE.

Analyses 20365, 20366, 20367, and 20368 (p. 36). Bituminous coal, bituminous coal field, from Fort Branch mine, a shaft mine 1 mile south of Fort Branch, on the Chicago & Eastern Illinois R. R. Coal bed, No. 5 of Indiana geological survey; Carboniferous (Allegheny) age, Carbondale formation. Bed, 5 to 6 feet thick, lies flat. Roof, black or grayish shale; floor, hard fire clay. Shaft, 400 feet deep. Cover at points of sampling, 430 feet. The bed was sampled by G. T. Powell, on December 3, 1914, as described on page following.

Sections of coal bed in Fort Branch mine.

Section	A	B	C
Analysis No.	20365	20366	20367
Roof, gray shale.	Ft. in.	Ft. in.	Ft. in.
Coal	1 9	1 3	1 2
"Sulphur"	¼	¼	¼
Coal	10	7	11
"Sulphur"	¼	.. ..	⅜
Coal	2	.. ..	1 3
"Mother coal"	¼	¼	.. ..
Coal	10	1 3	.. ..
"Sulphur"	¼	¼	¼
Coal	12	1 4	1 6
Floor, fine clay.			
Thickness of bed	4 8	4 5¾	4 10⅝
Thickness of coal sampled	4 8	4 5¾	4 10⅝

Section A (sample 20365) measured at face of 3 north entry, main east entry, 1,100 feet northeast of the shaft. Section B (sample 20366) measured at main west entry, 1,900 feet west of the shaft. Section C (sample 20367) measured at face of 2 north entry, west main entry, 2,000 feet northwest of the shaft.

The ultimate analysis of a composite sample made by combining face samples 20365, 20366, and 20367 is shown under laboratory No. 20368.

The room-and-pillar system of mining is used. In 1914 the coal was undercut with machines and shot down with black blasting powder at 4 p. m., after the miners were out of the mine. 80 per cent of the coal was screened. The output was about 250 tons per day, 65 per cent of which was from advance workings. There were about 1,750 acres still unmined.

KNOX COUNTY.

Bicknell. Indian Creek Mine.

Analyses 18435, 18436, and 18437 (pp. 36–37). Bituminous coal, bituminous coal field, from Indian Creek mine, 4 miles south of Bicknell, on a spur of the Vandalia R. R. Coal bed, No. 5 of Indiana geological survey; Carboniferous (Allegheny) age, Carbondale formation. Bed averages about 6½ feet thick; contains partings of bony coal and "sulphur." Roof, hard sandy shale; floor, shale, 1 foot thick, underlain by sandstone. Particles of the roof and floor did not mix with the coal in loading. Cover at points sampled, about 300 feet. The bed was sampled by J. T. Ryan on June 16, 1914, as described below:

Sections of coal bed in Indian Creek mine.

Section	A	B
Laboratory No.	18435	18436
Roof, hard sandy shale.	Ft. in.	Ft. in.
Coal	9½	9
"Sulphur"	[a] 1	[a] ¾
Coal	4	10
"Sulphur" to bony coal	¼	[a] 3½
Coal	2 0	8
Coal and "sulphur"	2	[a] ½
Coal, fairly clean	1 8½	1 0
"Sulphur" band	¼	[a] 2
Coal, clean	1 0	1 5½
Coal, with streaks of "sulphur"	.. ..	1 7
Floor, shale and sandstone.		
Thickness of bed	6 1½	6 10¼
Thickness of coal sampled	6 ½	6 3½

[a] Not included in sample.

Section A (sample 18435) was cut from face of main south entry, 1,900 feet from shaft. Section B (sample 18436) was cut from rib of last open crosscut between 3 and 4 south entries, 4 east south entry, 2,200 feet from the shaft.

The ultimate analysis of a composite sample made by mixing face samples 18435 and 18436 is shown under laboratory No. 18437.

The mine is worked on the room-and-pillar system. In 1914 the coal was undercut with chain machines and broken down with black blasting powder. The machine cuttings were loaded out with the coal. About 25 per cent of the coal was shipped as run-of-mine. The tipple was equipped with bar screens with 1¼-inch openings. No pickers were employed on the cars. The average production was 2,500 tons per day. Maximum day's run was 3,103 tons. The mine had been in operation about two years.

SULLIVAN COUNTY.

CARLISLE. VIOLA MINE.

Analyses 22217 to 22221 (p. 37). Bituminous coal, bituminous coal field, from Viola mine, a shaft mine, one-half mile north of Carlisle. Coal bed, No. 5; Carboniferous (Allegheny) age, Carbondale formation. Bed, 4 feet 6 inches to 5 feet 4 inches thick; dip, 1½° to 2° W. Roof, black shale 2 feet thick, overlain with gray shale; floor, medium hard fire clay, smooth surface. Shaft, 305 feet deep. The bed was sampled by J. R. Fleming May 6, 1915, as described below:

Section of coal bed in Viola mine.

Section	A		B		C		D	
Laboratory No.	22217		22218		22219		22220	
	Ft.	*in.*	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Roof, black shale.								
Coal, hard, bright, "sulphur" streak	1	8	2	11	1	2	0	8
Coal, "sulphur" streaks		10		[a]1		4	..	..
"Mother coal" and "sulphur"		[a]½	..	..	..	..	..	..
Coal, hard, bright	2	0	2	1	1	3	1	4
Coal and "sulphur"	..	..	..	..		[a]2		[a]3
Coal, hard, bright	..	..	..	..	1	10	1	1
"Sulphur" band	..	..	..	..	..	..		[a]½
Coal, bright	..	..	..	..	..	..		10
"Sulphur" lens	..	..	..	..	..	..		[a]½
Floor, clay and shale.								
Total thickness of bed	4	6½	5	1	4	9	4	6
Thickness of coal sampled	4	6	5	0	4	7	4	2

Section A (sample 22217) was measured at face of 9 south entry, main east entry, 4,000 feet southeast of shaft. Section B (sample 22218) was measured near 3 room, at face of 8 south entry, main east entry, 3,500 feet southeast of shaft. Section C (sample 22219) was measured at face of 1 west entry, 5 south entry, main east entry, 3,000 feet south of shaft. Section D (sample 22220) was measured at face of 5 room, 8 north entry, main east entry, 3,500 feet northeast of shaft.

The ultimate analysis of a composite sample, made by combining face samples 22217, 22218, 22219, and 22220, is shown under laboratory No. 22221.

No. 5 bed is worked by the room-and-pillar system. No. 6 bed was worked from 1905 to 1908, and the shaft was then sunk to No. 5 bed, which has been worked since that date. No. 3 bed occurs at a depth of 495 feet, but is not being worked. In 1915 the coal was shot off the solid with black blasting powder by shot firers after the miners were out of the mine. Ten per cent of the coal was shipped as "run-of-mine"; the tipple had 1¼-inch bar screens, 12 feet long, and shaking screens with 1¼-inch openings; 50 per cent of the coal screened passed through the screens. The track had a capacity of 20 empty and 10 loaded cars. The average daily output was 450 tons; 75 per cent of the coal was taken from advance work. The lifetime of mine was estimated to be about 10 years.

DUGGER. VANDALIA NO. 10 MINE.

Analyses 23224 to 23227 (p. 37). Bituminous coal, bituminous coal field, from Vandalia No. 10 mine, a shaft mine 1½ miles southwest of Dugger, on the Vandalia R. R. Coal bed, No. 4 of Indiana geological survey; Carboniferous (Allegheny) age, Carbondale formation. Bed is 4½ to 5½ feet thick, has a slight dip to the southwest, and a distinct cleat. Roof, gray shale; above the shale is a sandstone cap rock. Floor, gray shale 3 feet thick, below the shale is sandstone. Shaft, 265 feet deep. The bed was sampled by J. R. Fleming on November 5, 1915, as described below:

Sections of coal bed in Vandalia No. 10 mine.

Section	A	B	C
Laboratory No	23224	23225	23226
Roof, gray shale.			
Coal, bright, brittle	1 7	2 6	1 3
"Mother coal" and bone	.. ..	.. ..	½
Coal	.. ..	.. ..	9
"Mother coal" and bone	[a] 1	[a] ¾	[a] ½
Coal, hard, bright	1 1	3	11
"Dirt band" or "binder"	[a] 2	[a] 3	[a] 3
Coal, hard, bright	10	3	2 0
"Sulphur" parting	Streak.	[a] ½	.. ..
Coal, bright, hard	[b] 1 2	1 7	.. ..
Floor, clay.			
Thickness of bed	4 11	4 11	5 3
Thickness of coal sampled	4 8	4 7	4 11½

[a] Not included in sample. [b] Contained "mother-coal" partings.

Section A (sample 23224) was measured at the face of 7 room, 3 north entry, 2 east entry, 3 north entry, main east entry, 3,500 feet northeast of the shaft. Section B (sample 23225) was measured at the face of 8 room, 3 south entry, 1 east entry, 3 north entry, main east entry, 3,200 feet northeast of the shaft. Section C (sample 23226) was measured at the face of 11 room, 1 east entry, 9 south entry, main east entry, 3,200 feet southeast of the shaft.

The ultimate analysis of a composite sample made by combining equal parts of face samples 23224, 23225, and 23226 is shown under laboratory No. 23227.

The room-and-pillar system of mining is used. In 1915 the coal was undercut with electric chain machines and shot down with black blasting powder. Grades of coal shipped were lump over 1¼-inch screens, screenings which pass through 1¼-inch screens, crushed mine-run to any size, and mine-run. The daily average output of the mine was 1,500 tons, with a capacity of 2,000 tons. The probable lifetime of the mine was about four years.

For analyses and descriptions of other samples of coal from this mine, see Bureau of Mines Bull. 85, 1914, pp. 37, 199.

VANDERBURG COUNTY.

EVANSVILLE. SUNNYSIDE MINE.

Analyses 20249 to 20253 (p. 37). Bituminous coal, bituminous coal field, from Sunnyside mine, a shaft mine at Evansville, on the belt line of the Chicago & Eastern Illinois R. R. Coal bed, No. 5 of the Indiana geological survey; Carboniferous (Allegheny) age, Carbondale formation. Bed varies in thickness from 3 feet 4 inches to 4 feet 8 inches; lies flat. Roof, gray shale; floor, hard clay. Depth of shaft, 265 feet. The bed was sampled by G. T. Powell on November 27, 1914, as shown on page following.

Sections of coal bed in Sunnyside mine.

Section	A	B	C	D
Laboratory No.	20249	20251	20252	20250
Roof, gray shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Top coal	.. ..	.. ..	2	.. ..
Coal	10	5	5	10
"Sulphur"	Streak.	a 1/8	a 1/2	1/8
Coal	3 1/2	1 0	7	8
"Mother coal"	3/4	.. ..	1/2	1/4
"Sulphur"	.. ..	a 3/4	.. ..	.. ..
Coal	4	10	9	8
"Sulphur"	a 1/4	1/16	1/8	1/16
Coal	1 0	10	1 3	1 5
"Mother coal"	1/4	.. ..	.. ..	1/2
"Sulphur"	.. ..	1/4	a 1/2	.. ..
Coal	1 2	10	4 1/2	1 0
Floor, clay.				
Thickness of bed	3 8 3/4	4 3/16	3 8	4 7 1/16
Thickness of coal sampled	3 8 1/2	3 11 5/16	3 7 1/4	4 7 1/16

a Not included in sample.

Section A (sample 20249) was measured at face of 4 east entry, main north entry, 3,400 feet northeast of shaft. Section B (sample 20251) was measured at head of main west entry, 3,800 feet west of shaft. Section C (sample 20252) was measured at the face of 5 west entry, 3,200 feet west of main shaft. Section D (sample 20250) was measured at face of main north entry, 3,200 feet north of shaft.

The ultimate analysis of a composite sample made by combining face samples 20249, 20250, 20251, and 20252 is shown under laboratory No. 20253.

The room-and-pillar system of mining is used. In 1914 the coal was shot off the solid with black blasting powder by shot firers after the miners were out of the mine. About half of the coal was shipped as run-of-mine, and about 35 per cent was screened. The average daily output was 250 tons. The mine was nearly worked out, its probable life being not over three years and what coal remained consisted mostly of pillar workings.

VERMILION COUNTY.

Clinton. Crown Hill No. 3 Mine.

Analyses 23212, 23213, 23215, and 23217 (p. 37). Bituminous coal, bituminous coal field, from Crown Hill No. 3 mine, a shaft mine 2½ miles southwest of Clinton, on the Chicago & Eastern Illinois R. R. Coal bed, No. 3 of the Indiana geological survey; Carboniferous (Allegheny) age, Carbondale formation; average thickness about 6 feet. Roof, shale about 14 feet thick; the shale is overlain with sandstone cap rock. Floor, hard clay, about 4 feet thick. One to two feet of top coal is left up in the entries for roof but is taken down in rooms. The coal contains several partings of mother coal, "sulphur," and bone. Average thickness of cover, 360 feet. The bed was sampled by J. R. Fleming October 2, 1915, as described below:

Sections of coal bed in Crown Hill No. 3 mine.

Section	A	B	C	D
Laboratory No.	23212	23213	23215	23216
Roof, shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Top coal	7	7	a 1 0	a 1 0
"Sulphur" band	a 1	a 1	a 1	a 1
Coal, hard, bright	2 4	2 4	1 4	1 0
Bone and "mother coal"	.. ..	.. ..	a 1/2	a 1/2
Coal, hard, bright	.. ..	.. ..	9	5
"Sulphur" band	a 1 1/2	a 1 1/2	a 3	a 1/2
Coal, hard, bright	11	11	10	9
Bone and "sulphur"	a 1/2	a 1/2	a 1/2	a 1 1/2
Coal, hard, bright	1 4	1 4	10	2 6
Bone and "sulphur"	a 1/2	a 1/2	a 1	.. ..
Coal, hard, bright	8	8	10	.. ..
Floor, hard clay.				
Thickness of bed	6 1 1/2	6 1 1/2	6 1	5 11 1/2
Thickness of coal sampled	5 10	5 10	4 7	5 8

a Not included in sample.

Section A (sample 23212) was measured at face of last room, 4 west entry, 3 north entry, main west entry, 3,600 feet from shaft. Section B (sample 23213) was measured at face of 3 room, 4 east entry, 3 north entry, main west entry, 3,000 feet from shaft. Section C (sample 23215) was measured at face of 14 room, main west entry. Section D (sample 23216) was measured at face of 5 south entry, main west entry.

The ultimate analysis of a composite sample made by combining equal parts of face samples 23212, 23213, 23215, and 23216 is shown under laboratory No. 23217.

The mine is worked on the room-and-pillar panel system. In 1915 part of the coal was undercut with compressed-air puncher machines and shot down with black blasting powder; dynamite was used for brushing the roof. The average daily output was about 1,000 tons; the capacity was about 1,400 tons.

Clinton. Dering No. 1 Mine.

Analyses 25345 to 25349 (p. 38). Bituminous coal, bituminous coal field, from Dering No. 1 mine, a shaft mine in the Clinton district, 1¾ miles southwest of Clinton, on the Chicago & Eastern Illinois R. R. Coal bed, No. 3 of the Indiana geological survey; Carboniferous (Allegheny) age, Carbondale formation. Bed averages about 6 feet thick. One thrust fault has been encountered, displacement 14 feet. There is no pronounced cleat. Roof, blue shale about 5 feet thick; above the shale is a sandstone cap rock. Floor, hard clay 5 feet thick; beneath the clay is 14 inches of coal. Shaft, 228 feet deep. Cover at points of sampling, about 200 feet. The bed was sampled by J. R. Fleming June 3, 1916, as described below:

Sections of coal bed in Dering No. 1 mine.

Section	A		B		C		D	
Laboratory No.	25345		25346		25347		25348	
Roof, slaty shale.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Coal, bright	1	0		6		11	1	10
"Mother coal" and "sulphur"		[a] ½		[a] ¾		[a] 1		[a] 2
Coal, bright	1	3	2	1	2	2		6
Shale and "sulphur"	Streak.			[a] 3½		[a] 1½		[a] 1
Coal, hard	1	1		9	..	..		8
Shale and "sulphur"		[a] 1½		[a] ½	..	..		[a] 2½
Coal, hard	1	5		9½	1	5		6
"Mother coal" and "sulphur"	..	..		[a] ½	..	..		[a] ½
Coal, dull bands	..	..		4	..	..		10
Coal, high in "sulphur"		[a] ½		[a] 1¼		[a] ½		[a] ½
Coal, laminated	1	5½		10	1	0	1	0
Floor, underclay.								
Thickness of bed	6	5	5	10	5	9	5	10½
Thickness of coal sampled	6	2½	5	3½	5	6	5	4

[a] Not included in sample.

Section A (sample 25345) was measured at face of 15 room, 1 east entry, 2 southeast entry. Section B (sample 25346) was measured at the face of 10 room, 6 east entry, 2 northeast entry. Section C (sample 25347) was measured at the face of 11 room, 5 west entry, 2 southwest entry. Section D (sample 25348) was measured at the face of 1 room, 8 west entry, 2 north entry, main west entry.

The ultimate analysis of a composite sample made by combining equal portions of face samples 25345 to 25348 is shown under laboratory No. 25349.

The coal is mined by the room-and-pillar panel system. In 1916 the coal was undercut by electric chain cutting shortwall machines, and shot down with black blasting powder. Equipment was provided to load run-of-mine, 1¼ inch lump, 2½ inch lump, and 4-inch lump. Shaking screens were employed. About 30 per cent passed through 1¼-inch screen. Average daily output was 1,500 tons, mostly from advance workings.

CLINTON. WEST CLINTON NO. 1 MINE.

Analyses 21874, 21875, and 21876 (p. 38). Bituminous coal, bituminous coal field, from West Clinton No. 1 mine, a shaft mine 175 feet deep, at Clinton, one-half mile east of Blanford on the Chicago, Terre Haute & Southeastern Ry. Coal bed, No. 5 of the Indiana geological survey; Carboniferous (Allegheny) age, Carbondale formation. Bed is about 4 feet 8 inches thick and has a slight dip to the north. The roof is shale, and contains many large "niggerheads." The floor is a soft, light-gray underclay. The bed was sampled by H. I. Smith, March 26, 1915, as described below:

Sections of coal bed in West Clinton No. 1 mine.

Section	A	B
Laboratory No.	21874	21875
Roof, shale.		
Coal	1 9½	4½
"Mother coal"	1/4	.. ..
"Sulphur"	.. ..	1½
Coal	1 6¼	2 6
"Mother coal"	.. ..	½
Coal	.. ..	1 0
"Sulphur" and coal	a 3	a 3
Coal	1 ¼	4
Floor, clay.		
Thickness of bed	4 7¼	4 7½
Thickness of coal sampled	4 4¼	4 3

a Not included in sample.

Section A (sample 21874) was measured at the face of 3 east south entry, 40 feet in by 16 room. Section B (sample 21875) was measured at the face of 5 room, 4 west south entry.

The ultimate analysis of a composite sample made by combining face samples 21874 and 21875 is shown under laboratory No. 21876.

Room-and-pillar system of mining. In 1915 the coal was partly sheared, and was shot down with black powder. There were two "sulphur" bands in the coal, which were excluded from the coal as shipped. The output was about 1,700 tons per day.

VIGO COUNTY.

LIGGETT. VANDALIA NO. 82 MINE.

Analyses 23113 to 23117, and 24063 to 24065, inclusive (p. 38). Bituminous coal, bituminous coal field, from Vandalia No. 82 mine, a shaft mine, at Liggett, 6 miles west of Terre Haute, on the Vandalia R. R. Coal bed, No. 5 of the Indiana geological survey; Carboniferous (Allegheny) age, Carbondale formation. Bed varies in thickness, averaging about 4¼ feet; dip irregular. There are no consistent partings, although occasionally "sulphur" streaks are encountered. Roof, flexible, dark-colored shale; floor, brittle, light-colored underclay. Shaft, 245 feet deep. Cover at point of sampling, 250 feet. The bed was measured and sampled by J. R. Fleming, October 21, 1915, and by H. I. Smith, January 26, 1916, as described below:

Sections of coal bed in Vandalia No. 82 mine.

Section	A	B	C	D	E	F
Laboratory No.	23113	23114	23115	23116	24063	24064
Roof, black shale.						
Coal, hard, bright	1	6	1 2	8	3 2	3 8½
"Mother coal," "sulphur," and bone	a ½	Streak.	a 1	a 1	a 1	.. ..
Coal, bright, brittle	1 0	3 6	1 2	2 7	3	.. ..
Bone and "sulphur"	a ½	.. ..	a 2	a ½	a 2	a ½
Coal, bright, brittle	1 1	.. ..	.. ..	9½	8	4½
Bone and "sulphur"	a 1	.. ..	.. ..	.. ..	.. ..	.. ..
Coal, dull	1	.. ..	1 5	.. ..	.. ..	.. ..
Floor, clay						
Thickness of bed	4 3	4 0	4 0	4 2	4 4	4 1½
Thickness of coal sampled	4 1	4 0	3 9	4 ½	4 1	4 1

a Not included in sample.

Section A (sample 23113) was measured at the face of A W entry, 2,200 feet southeast of the shaft. Section B (sample 23114) was measured at the face of B F entry, 1,900 feet northeast from the shaft. Section C (sample 23115) was measured at the face of 40 room, L entry, 2,200 feet south of the shaft. Section D (sample 23116) was measured at the face of 20 room, B I entry, 2,200 feet east of the shaft. Section E (sample 24063) was measured on the north side of west lead to double parting on C I entry, 1,400 feet northeast from the shaft. Section F (sample 24064) was measured on the south side of west lead to double parting on C I entry, 1,400 feet from the shaft.

The ultimate analysis of a composite sample made by combining samples 23113 to 23116 is given under laboratory No. 23117. The ultimate analysis of a composite sample made by combining samples 24063 and 24064 is given under laboratory No. 24065.

The mine is worked on the double-entry, room-and-pillar system; diagonal entries are driven from the main north and the main south entries to facilitate development. In 1916 the coal was shot from the solid with black blasting powder. The floor was taken up in the haulage entries to give height. The mine is naturally dry. About 10 per cent of the coal shipped as run-of-mine; 48 per cent of the coal screened passed through a 12 by 6 inch screen with 1¼-inch openings. There were three loading tracks, with capacity for 35 loaded and 35 empty cars. The daily output was about 1,300 tons per day. There were 2,000 acres tributary to this opening, and the probable lifetime of the mine was estimated to be about 15 years.

KANSAS.

CRAWFORD COUNTY.

PITTSBURG. CENTRAL MINE.

Analyses 23238, 23239, 23240, and 23244 (p. 39). Bituminous coal, Kansas field, from Central mine, a steam-shovel strip pit, 4 miles southwest of Pittsburg. Coal bed, lowest bed, locally known as the Cherokee; Carboniferous age, Cherokee shale. The bed was sampled on October 22, 1915, by C. E. Lesher, as follows:

Sample 23239 represented medium-grade coal and was taken 300 feet down the dip from the place where sample 23238 was taken. Only the top 12 inches of the bed was represented, as the lower part was not exposed.

Sample 23238 represented the upper 12 inches of the bed, which was weathered coal, locally known as "dead" coal, and was taken 200 feet from the outcrop in an open pit.

Sample 23240 represented the best quality of coal in this pit. The bed measured 42 inches thick and the sample was taken across the full face. The bed contained no partings of bone or "sulphur." The sample was taken about 1,000 feet from the outcrop.

Sample 23244 represented weathered ("dead") coal and was a grab sample obtained in a fault zone 200 feet from the point where sample 23240 was taken.

PITTSBURG. PATTON MINE.

Analysis 23237 (p. 39). Bituminous coal, Kansas field, from Patton mine, a steam-shovel strip pit, 2 miles north of Pittsburg. Coal bed, unnamed bed lying about 50 feet (?) vertically above the basal Cherokee bed; Carboniferous age, Cherokee shale. The bed is overlain by hard blue shale, 4 to 6 feet thick.

The bed was sampled by C. E. Lesher on October 23, 1915. The full thickness of the bed was 22 inches, all of which was included in the sample.

KENTUCKY.

BELL COUNTY.

ARJAY. GLENDON MINE.

Analyses 21557 to 21561 (p. 39). Bituminous coal, eastern Kentucky field, from Glendon mine, a drift mine at Arjay, on the Louisville & Nashville R. R. Coal bed, Straight Creek; Carboniferous age, Pottsville formation. The bed is about 3 feet thick and lies nearly flat; contains light "sulphur" bands and "mother coal." Roof, shale; floor, hard clay and sand rock. The bed was sampled by G. T. Powell on May 22, 1915, as described below:

Sections of coal bed in Glendon mine.

Section	A		B		C		D	
Laboratory No.	21557		21558		21559		21560	
Roof, shale.	Ft.	in.	Ft.	in.	Ft.	in.	Ft.	in.
Coal	2	3	..	..		[a] 3		[a] 2
Shaly coal	..	..		[a] 3	..	..	..	..
"Mother coal"		½	..	..	..	..	..	..
Shale	..	..	..	..		[a] 5		[a] 8
Coal	1	1	3	1½	3	2	2	11
Floor, clay and sand rock.								
Thickness of bed	3	4½	3	4½	3	10	3	9
Thickness of coal sampled	3	4½	3	1½	3	2	2	11

[a] Not included in sample.

Section A (sample 21557) was measured at face of 8 right entry, 3,400 feet from the mine opening. Section B (sample 21558) was measured at face of 12 right entry, 4,200 feet from the mine opening. Section C (sample 21559) was measured at face of 7 right entry, 2,000 feet from the mine opening. Section D (sample 21560) was measured at face of 4 right entry, 3,200 feet from the mine opening.

The ultimate analysis of a composite sample made by combining face samples 21557, 21558, 21559, and 21560 is shown under laboratory No. 21561.

The room-and-pillar system of mining is used. In 1915 the coal was shot off the solid with black blasting powder. About 38 per cent of the coal was shipped as lump coal, 25 per cent in smaller sizes, and the balance was screened. The average daily output was about 500 tons. There was about 750 tons still to be mined from this opening. Seventy-five per cent of the coal is recovered.

CHENOA. CHENOA HIGNITE MINE.

Analyses 21786 to 21789 (p. 39). Bituminous coal, eastern Kentucky field, from Chenoa Hignite mine, a drift mine 1 mile southeast of Chenoa on the Louisville & Nashville R. R. Coal bed, known as the Lower Hignite; Carboniferous age, Pottsville group. Bed 3 feet 10 inches thick; dips 2° N. Roof, sandstone or shale; floor, clay. The bed was sampled by G. T. Powell March 29, 1915, as described below:

Sections of coal bed in Chenoa Hignite mine.

Section	A		B		C		D	
Laboratory No.	21786		21787		21788		21789	
Roof, sandstone.	Ft.	in.	Ft.	in.	Ft.	in.	Ft.	in.
Coal	3	0	3	1½	3	1	2	9
Clay and shale		[a] 1½		[a] 3		[a] 3		[a] 1
Coal		1½		6½		6½		1
Clay and shale		[a] ½	..	..	..	..		1
Coal		6	..	..	..	..		6
Floor, clay.								
Thickness of bed	3	9½	3	11	3	10½	3	6
Thickness of coal sampled	3	7½	3	8	3	7½	3	5

[a] Not included in sample.

Section A (sample 21786) was measured at face of 6 right entry, 2,000 feet from mine opening. Section B (sample 21787) was measured at face of main entry, 1,700 feet from mine opening. Section C (sample 21788) was measured at face of 1 left entry, 1,500 feet from mine opening. Section D (sample 21789) was measured at face of 5 right entry, 2,000 feet from mine opening.

The results of an ultimate analysis of a composite sample, made by combining face samples 21787, 21788, and 21789, is shown under laboratory No. 21790.

The room-and-pillar system of mining is used. In 1915 the coal was undercut with chain machines and shot down with black powder during the shift. The output was about 300 tons per day, all of which was from advance workings. In advance workings, about 65 per cent of the coal was taken out, and 15 per cent on the retreat. There was about 500 acres of coal to be mined.

For geologic relations of this coal see U. S. Geol. Survey Bull. 225, 1904, p. 262.

Chenoa. Log Mountain No. 1 Mine.

Analyses 21781 to 21785 (p. 39). Bituminous coal, eastern Kentucky field, from Log Mountain No. 1 mine, a drift mine 2 miles southeast of Chenoa, on the Louisville & Nashville R. R. Coal bed known as the Mason; Carboniferous age, Pottsville group. Bed is about 3 feet 4 inches thick; dip, 5 per cent. Roof, sandy shale resembling sandstone; floor, hard clay. In some parts of the bed is a clay parting. The bed was sampled by G. T. Powell on March 31, 1915, as described below:

Sections of coal bed in Log Mountain No. 1 mine.

Section	A	B	C	D
Laboratory No.	21781	21782	21783	21784
Roof, shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal	1 5½	1 0	3 1	1 4
Clay shale	a1	.. ..	.. ..	a4
"Mother coal" and bone	.. ..	1	1	.. ..
Coal	2 4	2 4½	10½	2 3
Floor, clay.				
Thickness of bed	3 10½	3 5½	4 ½	3 11
Thickness of coal sampled	3 9½	3 5½	4 ½	3 7

a Not included in sample.

Section A (sample 21781) was measured at face of main entry, 1,900 feet from mine opening. Section B (sample 21782) was measured at face of 5 left entry, 1,600 feet from mine opening. Section C (sample 21783) was measured at face of 6 diagonal entry, 3,000 feet from mine opening. Section D (sample 21784) was measured at face of 4 right entry, 1,500 feet from mine opening.

The ultimate analysis of a composite sample made by combining face samples 21781, 21782, 21783, and 21784 is shown under laboratory No. 21785.

The room-and-pillar system of mining is used. In 1915 the coal was undercut with machines and shot down with black blasting powder during the shift, little powder being required. The output was about 350 tons per day, 60 per cent of which was from advance workings. About 15 per cent was recovered from pillars. There was still about 600 acres of coal to be mined.

Colmar. Amru Mine.

Analyses 21681 to 21685, inclusive (pp. 39–40), bituminous coal, eastern Kentucky field, from Amru mine, a drift mine 1 mile north of Colmar, on the Louisville & Nashville R. R. Coal bed, known as the Mason; Carboniferous age, Pottsville group. Bed is 3 feet 2 inches to 3 feet 4 inches thick, and lies practically flat. Roof, hard shale; floor, shale. The bed was sampled by G. T. Powell on March 26, 1915, as described on page following.

Sections of coal bed in Amru mine.

Section	A	B	C	D
Laboratory No.	21681	21682	21683	21684
Roof, shale.				
Coal	2 7	2 7	2 10	2 6½
Coal, hard (bone)	4	3	2	.. ..
"Mother coal"	.. ..	.. ..	.. ..	½
Coal	1	4½	4	3
Coal, hard (bone)	.. ..	.. ..	.. ..	2
Coal	.. ..	.. ..	.. ..	4½
Floor, shale.				
Thickness of bed	3 0	3 2½	3 4	3 4½
Thickness of coal sampled	3 0	3 2½	3 4	3 4½

Section A (sample 21681) was measured at face of 5 left entry, 3,400 feet from mine opening. Section B (sample 21682) was measured at face of 6 right entry, 2,200 feet from mine opening. Section C (sample 21683) was measured at face of 7 left entry, 2,300 feet from mine opening. Section D (sample 21684) was measured at face of 2 left entry, 3,600 feet from mine opening.

The ultimate analysis of a composite sample, made by combining face samples 21681, 21682, 21683, and 21684, is shown under laboratory No. 21685.

The room-and-pillar system of mining is used. In 1915 the coal was undercut by pick and wedged down, no powder being used. The coal was all shipped as run-of-mine. In advance workings, about 60 per cent of the coal was taken out. About 3,000 acres are still to be mined from this opening.

Fourmile. East Jellico Mine.

Analyses 21796, 21797, and 21798 (p. 40). Bituminous coal, eastern Kentucky field, from East Jellico mine, a drift mine 3 miles southwest of Fourmile, on the Louisville & Nashville R. R. Coal bed, Dean; Carboniferous age, Pottsville group. Bed is 3 feet 8 inches thick and lies flat. Roof, sandstone; floor, clay. The bed was sampled by G. T. Powell on April 1, 1915, as described below:

Sections of coal bed in East Jellico mine.

Section	A	B	C
Laboratory No.	21796	21797	21798
Roof, sandstone.			
Coal	1 10	5½	1 9
"Mother coal"	.. ..	½	.. ..
Coal	.. ..	1 8	.. ..
Coal, hard	5	6	1 10
Fire clay, flinty	[a] 5½	[a] 6	[a] 5
Coal	1 1	1 1	11
Floor, clay.			
Thickness of bed	3 9½	4 3	3 11
Thickness of coal sampled	3 4	3 9	3 6

[a] Not included in sample.

Section A (sample 21796) was measured at face of 1 right entry, 3 main entry, 700 feet from mine opening. Section B (sample 21797) was measured at face of 1 left entry, 3 main entry, 1,000 feet from mine opening. Section C (sample 21798) was measured at face of 1 right entry, 2 main entry, 750 feet from mine opening.

The ultimate analysis of a composite sample made by combining face samples 21796, 21797, and 21798 is shown under laboratory No. 21799.

The room-and-pillar system of mining is used. In 1915 the coal was undercut by machine and shot down with black blasting powder. The coal was all shipped as run-of-mine. The average daily output was 300 tons. About 50 per cent of the coal is recovered. There was about 300 acres still to be mined from this opening.

FOURMILE. MAGNET MINE.

Analyses 21791 to 21794 (p. 40). Bituminous coal, eastern Kentucky field, from Magnet mine, a drift mine, 2 miles southwest of Fourmile, on the Louisville & Nashville R. R. Coal bed, Dean; Carboniferous age, Pottsville group. This bed is worked in the East Jellico mine. The bed ranges in thickness from 4 to 5 feet and lies flat. Roof, sandstone shale; floor, clay. The bed was sampled by G. T. Powell March 30, 1915, as described below:

Sections of coal bed in Magnet mine.

Section	A	B	C	D
Laboratory No.	21791	21792	21793	21794
Roof, shale.				
Coal	1 1	1 6	1 4	1 3
Fire clay, flinty	[a] 2½	[a] 11	[a] 9	[a] 9
Slaty shale and "jack rock"	[a] 7½	.. ..	[a] 4	[a] 3½
Coal, bony	[a] 6	[a] 2	[a] 4½	.. ..
Coal	2 3	2 3	2 2	1 8
"Sulphur" and "dirt"	.. ..	.. ..	.. ..	2
Coal	.. ..	.. ..	.. ..	3
Floor, clay.				
Thickness of bed	4 8	4 10	4 11½	4 4½
Thickness of coal sampled	3 4	3 9	3 6	3 4

[a] Not included in sample.

Section A (sample 21791) was measured at face of 4 left entry, 2,100 feet from mine opening. Section B (sample 21792) was measured at 6 room, 3 right entry, 1,700 feet from mine opening. Section C (sample 21793) was measured at face of 5 left entry, 2,200 feet from mine opening. Section D (sample 21794) was measured at face of main entry, 2,200 feet from mine opening.

The ultimate analysis of a composite sample made by combining face samples 21791, 21792, 21793, and 21794 is shown under laboratory No. 21795.

The room-and-pillar system of mining is used. In 1915 the coal was shot down with black blasting powder. The coal contains a thick band of impure material, which was not allowed to become mixed with the coal in loading. The output was about 300 tons per day; 55 per cent of the coal was from advance workings. There was still 500 acres to be mined from this opening. There were three tracks with a capacity of 30 cars.

FOX RIDGE. FOX RIDGE MINE.

Analyses 21552 to 21556 (p. 40). Bituminous coal, eastern Kentucky field, from Fox Ridge mine, a drift mine at Fox Ridge, on the Louisville & Nashville R. R. Coal bed, Straight Creek; Carboniferous age, Pottsville formation. Bed is 3 feet thick, dip, 2½° NE. Roof, shale; floor, hard blue flinty rock known as "jack rock." The bed was sampled by G. T. Powell March 20, 1915, as follows:

Sample 21552 was measured at face of 12 left entry, 4,600 feet from mine opening, and represented 3 feet ½ inch of coal. Sample 21553 was measured at face of 12 right entry, 4,500 feet from mine opening, and represented 3 feet of coal. Sample 21554 was measured at 10 right entry, 4,500 feet from mine opening, and represented 3 feet 3 inches of coal. Sample 21555 was measured at main air course, 4,600 feet from mine opening, and represented 3 feet 3 inches of coal. Each sample represents the thickness of the bed; the roof was shale and the floor was "jack rock."

The ultimate analysis of a composite sample made by combining face samples 21552, 21553, 21554, and 21555 is shown under laboratory No. 21556.

The room-and-pillar system of mining is used. At the time the mine was visited the coal was undercut with machines and shot down with black powder and dynamite. About 50 per cent of the coal was screened. The output was about 400 tons per day. About 70 per cent of the coal is recovered. There were about 500 acres to be mined from this opening.

HARRISON. LOG MOUNTAIN NO. 52 MINE.

Analyses 21617 to 21621 (p. 41). Bituminous coal, eastern Kentucky field, from Log Mountain No. 52 mine, a drift mine at Harrison, on the Louisville & Nashville R. R. Coal bed, known as the Poplar Lick; Carboniferous age, Pottsville group. Bed is about 4 feet thick, dips 3½° SE. Roof, shale, 3 feet thick; floor, hard bituminous shale. The bed was sampled by G. T. Powell March 24, 1915, as described below:

Sections of coal bed in Log Mountain No. 52 mine.

Section	A	B	C	D
Laboratory No.	21617	21618	21619	21620
Roof, shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	1 1½	1 2	1 4	1 2
Shale	[a] 5	[a] 5	[a] 5½	[a] 4
Coal	4½	3	2½	3½
"Jack rock" (bone)	[a] 1½	[a] 3	[a] 3	[a] 1
Coal	1 8	2 0	1 9½	2 1
Floor, bituminous shale.				
Thickness of bed	3 8½	4 1	4 ½	3 11½
Thickness of coal sampled	3 2	3 5	3 4	3 6½

[a] Not included in sample.

Section A (sample 21617) was measured at face of 7 left entry, 3,200 feet from opening. Section B (sample 21618) was measured at face of 7 right entry, 3,400 feet from mine opening. Section C (sample 21619) was measured at face of 2 face heading, 3,000 feet from mine opening. Section D (sample 21620) was measured at face of 5 left entry, 3,200 feet from mine opening.

The ultimate analysis of a composite sample made by combining face samples 21617, 21618, 21619, and 21620 is shown under laboratory No. 21621.

The room-and-pillar system of mining is used. In 1915 the coal was undercut with picks in the shale band, and wedged down, no explosives being used. The seam contains a shale band about 5 inches thick, and 2 inches of "jack rock"; also "sulphur" streaks. Half of the output was shipped as run-of-mine, and the rest was screened. The output was about 350 tons per day; about 50 per cent of the coal was from advance workings, and 20 per cent from pillars. There are still about 500 acres to be mined from this opening.

For geologic relations of this coal see United States Geological Survey Bull. 225, 1904, p. 263.

KETTLE ISLAND. PIONEER MINE.

Analyses 21547 to 21551 (p. 41). Bituminous coal, eastern Kentucky field, from Pioneer mine, a drift mine at Kettle Island, on the Louisville & Nashville R. R. Coal bed, Straight Creek; Carboniferous age, Pottsville formation. Bed 3 to 4 feet thick; dip, 1½° NW. Roof, shale, 3 feet thick; floor, hard clay. The bed was sampled by G. T. Powell on March 19, 1915, as shown below:

Sections of coal bed in Pioneer mine.

Section	A	B	C	D
Laboratory No.	21547	21548	21549	21550
Roof, shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	4½	6½	6½	5½
Rash	[a] 2	.. ..	[a] 1½	[a] 4½
"Mother coal"	.. ..	.. ..	.. ..	.. ..
Coal	3 2	3 0	2	2 10
"Rash"	[a] 1	.. ..	.. ..	2
"Mother coal"	.. ..	.. ..	.. ..	.. ..
Coal	.. ..	.. ..	3	.. ..
Floor, clay.				
Thickness of bed	3 9½	3 7	3 11	3 10
Thickness of coal sampled	3 6½	3 7	3 9½	3 5½

[a] Not included in sample.

Section A (sample 21547) was measured at face of 6 left entry, 2,500 feet from mine opening. Section B (sample 21548) was measured at face of 6 right entry, 2,700 feet from mine opening. Section C (sample 21549) was measured at face of 4 left entry, 1,900 feet from mine opening. Section D (sample 21550) was measured at face of 1 left entry, 2,000 feet from mine opening.

The ultimate analysis of a composite sample made by combining face samples 21547, 21548, 21549, and 21550 is shown under laboratory No. 21551.

The room-and-pillar system of mining is used. A 1-inch to 4-inch seam of "rash" in the bed is excluded from the coal as shipped. In 1915 the coal was undercut with machines and was shot down during the shift with black powder. One-half of the coal was shipped as run-of-mine, and the rest was screened. The average daily output was 800 tons. There was about 3,500 acres to be mined from this opening. The probable lifetime of the mine is about 100 years. Two mines dump into one tipple. Over section A there was 185 feet of cover, and over section B 260 feet.

Rim. Rim No. 4 Mine.

Analyses 21622 to 21626 (p. 41). Bituminous coal, eastern Kentucky field, from Rim No. 4 mine, a drift mine at Rim, 1 mile northeast of Fourmile, on the Louisville & Nashville R. R. Coal bed, Hickory; Carboniferous age, Pottsville group. Bed is about 6 feet thick, and lies practically flat. Roof, hard shale; floor, medium hard shale. The bed was sampled by G. T. Powell March 25, 1915, as described below:

Sections of coal bed in Rim mine.

Section	A		B		C		D	
Laboratory No.	21622		21623		21624		21625	
Roof, hard shale.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Coal	1	3	1	5	1	6½	1	3
Coal, hard		2		2		3		3
Coal		6		5		6½		4½
Shale		a ½		a 1		a 5		a 1
Coal		3½		3		4		2
Shale		a ½		a ½		a 1		a 3
Coal		3		3		1½		2½
Shale		a 8		a 6		a 9		a 2
Coal		1		1½		3		11
Coal, bony		1½	..	..	..	..	..	..
Shale	..	..		a 2½		a 2½		a 3
Coal	1	3	1	0	1	3		8½
Shale		a 4	..	..		a 4	..	..
"Mother coal"	..	..		1	..	..	..	..
Coal		9		5½		8	..	..
Shale	..	..		a 6	..	..	..	..
Coal	..	..	1	6	..	..	..	..
Floor, clay.								
Thickness of bed	5	9	7	0	6	9	4	9½
Thickness of coal sampled	4	8	5	8	4	11½	4	½

a Not included in sample.

Section A (sample 21622) was measured at the face of 6 right entry, 3,200 feet from mine opening. Section B (sample 21623) was measured at the face of 6 left entry, 3,100 feet from mine opening. Section C (sample 21624) was measured at the face of 1 main entry, 3,200 feet from mine opening. Section D (sample 21625) was measured at the face of 4 left entry, 2,400 feet from mine opening.

The ultimate analysis of a composite sample made by combining face samples 21622, 21623, 21624, and 21625 is shown under laboratory No. 21626.

The room-and-pillar system of mining is used. In 1915 the coal was undercut with machines, and shot down with black powder at 11 a. m. and 4 p. m. by the miners. The output was about 350 tons per day. In advance workings about 55 per cent of the coal was taken out. The total recovery was about 85 per cent. There was still 2,000 acres to be mined.

STRAIGHT CREEK. BARKER NO. 2 & 3 MINE.

Analyses 21567 to 21572 (p. 41). Bituminous coal, eastern Kentucky field, from Barker No. 2 & 3 mine, a drift mine at Straight Creek on the Louisville & Nashville R. R. Coal bed, Straight Creek; Carboniferous age, Pottsville group. The bed is about 3 feet thick and lies flat. Roof, shale 3 to 4 feet thick; floor, soft clay. The bed was sampled by G. T. Powell on March 18, 1915, as described below:

Sections of coal bed in Barker No. 2 & 3 mine.

Section	A	B	C	D	E
Laboratory No.	21567	21568	21569	21570	21571
Roof, hard shale.					
"Rash" and shale	[a] 1½	[a] 2	.. ..	.. ..	.. 2
Coal	4 4½	4 4½	3 1½	1 6	3 3
"Mother coal"	.. ..	.. ..	.. ..	1	.. ..
Coal	.. ..	.. ..	.. ..	1 7	.. ..
Floor, clay.					
Total thickness	4 6	4 6½	3 1½	3 2	3 5
Thickness of coal sampled	4 4½	4 4½	3 1½	3 2	3 3

[a] Not included in sample.

Section A (sample 21567) was measured at face of 4 right entry, 1½ miles from mine opening. Section B (sample 21568) was measured at 5 north entry, 1¼ miles from mine opening. Section C (sample 21569) was measured at 3 right entry, 7 north entry, 1½ miles from mine opening. Section D (sample 21570) was measured at 4 right entry, 3 main entry, about 1½ miles from mine opening. Section E (sample 21571) was measured at 2 main entry, 1¼ miles from mine opening.

The ultimate analysis of a composite sample made by combining face samples 21567, 21568, 21569, 21570, and 21571 is shown under laboratory No. 21572.

The room-and-pillar system of mining is used. In 1915 the coal was undercut with machines and shot down with black powder during the shift. The output was about 650 tons per day. In advance workings about 60 per cent of the coal was taken out, and 25 per cent was recovered from pillars. This mine was 23 years old. Formerly two openings were used, but now only one is used.

TEJAY. TEJAY MINE.

Analyses 21562 to 21566 (p. 41). Bituminous coal, eastern Kentucky field, from Tejay mine, a drift mine at Tejay on the Louisville & Nashville R. R. Coal bed, known as the Mason or Creech; Carboniferous age, Pottsville group. Bed varies from 3 feet 10 inches to 4 feet 3 inches thick; lies flat. Roof, sandstone; floor, soft clay. The bed was sampled by G. T. Powell on March 23, 1915, as described below:

Sections of coal bed in Tejay mine.

Section	A	B	C	D
Laboratory No.	21562	21563	21564	21555
Roof, sandstone.				
Coal	3	3½	5	3
Shale and "mother coal"	¼	¼	½	½
Coal	2½	7	8	6
"Mother coal"	½	.. ..	.. ..	.. ..
Coal, hard	.. ..	1	2	5
Coal	1 1½	4	2 8	10
"Mother coal"	½	.. ..	.. ..	.. ..
Coal, hard	.. ..	2	.. ..	1
Coal	7	3 5	.. ..	2 1
Coal, hard	2	.. ..	.. ..	.. ..
Coal	8½	.. ..	.. ..	.. ..
"Mother coal"	½	.. ..	.. ..	.. ..
Coal	1 3	.. ..	.. ..	.. ..
Floor, clay.				
Thickness of bed	4 5¼	4 10¾	3 11½	4 2½
Thickness of coal sampled	4 5¼	4 10¾	3 11½	4 2½

Section A (sample 21562) was measured at face of 6 right entry, 2,600 feet from mine opening. Section B (sample 21563) was measured at face of 4 left entry, 3,600 feet from mine opening. Section C (sample 21564) was measured at face of 4 right entry, 2,000 feet from mine opening. Section D (sample 21565) was measured at face of 7 left entry, 2,800 feet from mine opening.

The ultimate analysis of a composite sample made by combining face samples 21562, 21563, 21564, and 21565 is shown under laboratory report No. 21566.

The room-and-pillar system of mining is used. In 1915 the coal was undercut with machines, and shot down with black powder during the shift. Tight, rotary dump cars were used in this mine. The output was about 450 tons per day. About 60 per cent of the coal was taken out in advance workings. The mine was new. There was about 3,000 acres of coal to be mined.

VARILLA. VARILLA MINE.

Analyses 21776 to 21780 (p. 41). Bituminous coal, eastern Kentucky field, from Varilla mine, a drift mine at Varilla, on the Louisville & Nashville R. R. Coal bed, Upper Hance; Carboniferous age, Pottsville group. Bed is 4 feet to 4 feet 8 inches thick, dips 2° NE. Roof, shale and sandstone; floor, hard shale and clay. The bed was sampled by G. T. Powell on March 27, 1915, as described below:

Sections of coal bed in Varilla mine.

Section	A	B	C	D
Laboratory No.	21776	21777	21778	21779
Roof, shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal	1 3	9	8½	1 2
Shale	[a] 1½	[a] 1½	[a] 2	[a] 2
Coal	9	3	3½	9
Hard coal (bone)	2	1	2	1
Coal	7	4½	2 10	2 1
Hard coal (bone)	4	½	.. ..	.. ..
Coal	1 5	2 4	.. ..	.. ..
Floor, shale.				
Thickness of bed	4 7½	3 11½	4 2	4 3
Thickness of coal sampled	4 6	3 10	4 0	4 1

[a] Not included in sample.

Section A (sample 21776) was measured at face of 2 main entry, 400 feet from mine opening. Section B (sample 21777) was measured at face of 10 left entry, 3,700 feet from mine opening. Section C (sample 21778) was measured at face of 7 right entry, 3,200 feet from mine opening. Section D (sample 21779) was measured at face of 5 right entry, 3,700 feet from mine opening.

The ultimate analysis of a composite sample, made by combining face samples 21776, 21777, 21778, and 21779, is shown under laboratory No. 21780.

The room-and-pillar system of mining is used. In 1915 the coal was undercut with machines, and was shot down with black powder during the shift. The output was about 400 tons per day, all of which was from advance workings. In advance workings about 60 per cent of the coal was taken out. There was about 2,000 acres still to be mined from this opening.

BUTLER COUNTY.

MORGANTOWN. GILLAM MINE.

Analyses 19399, 19400, and 19401 (p. 42). Bituminous coal, western Kentucky field, from Gillam mine, a country bank 1½ miles from Green River and 1½ miles southwest of Morgantown. Coal bed, not classified; Carboniferous age, Pottsville group. Thickness, 3 feet 9 inches. Roof, hard blue shale; floor, soft underclay. Cover at points of sampling, 25 feet. The bed was sampled by A. W. Harris and A. F. Crider on May 1, 1914, as described on page following.

Section of coal bed in Gillam mine.

Section	A	B
Laboratory No.	19399	19400
Roof, shale.	Ft. in.	Ft. in.
Coal, bony	a 2½	a 2
Coal, hard	6¾	7
"Sulphur" band and "mother coal"	¼	¼
Coal	2 6	2 7
Coal, bony, high in ash	5	a 5
Floor, underclay.		
Thickness of bed	3 8½	3 9¼
Thickness of coal sampled	3 6	3 2¼

a Not included in sample.

Section A (sample 19399) was cut from left rib, 1 room, main west entry, 100 feet from opening. Section B (sample 19400) was cut from left rib of 1 room, main west entry, 100 feet from opening.

The ultimate analysis of a composite sample, made by mixing samples 19399 and 19400, is shown under laboratory No. 19401.

The output was used entirely to supply local trade.

CHRISTIAN COUNTY.

EMPIRE. EMPIRE MINE.

Analyses 19293, 19294, 19295, 19296, and 19297 (p. 42). Bituminous coal, western Kentucky field, from Empire mine, a shaft mine three-quarters mile west of Empire on spur of Louisville & Nashville R. R. Coal bed, locally known as Empire; Carboniferous age, Pottsville formation. Roof, hard gray shale; floor, very hard smooth clay. Bed 3 feet 6 inches to 4 feet 4½ inches thick; fairly clean except for numerous irregular "sulphur" bands. In the northern part of the mine is a thin band of cannel coal, 3 to 7 inches thick, which comes out in large blocks and is an excellent shipping coal. Cover at points of sampling, 150 feet. The bed was sampled by A. W. Harris and A. F. Crider on April 24, 1914, as described below:

Sections of coal bed in Empire mine.

Section	A	B.	C	D
Laboratory No.	19293	19294	19295	19296
Roof, shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal, hard	.. ..	.. ..	10	.. ..
"Sulphur" band	.. ..	.. ..	¼	.. ..
Coal, hard	.. ..	.. ..	1½	5½
"Sulphur" band	.. ..	.. ..	Streak.	Streak.
Coal, hard	.. ..	1 7½	6½	7½
"Sulphur" band	.. ..	¼	Streak.	Streak.
Coal, hard	a 2 10	1 5½	1 3½	1 9
Cannel coal	.. ..	3	3½	7
Coal, hard	.. ..	3	2½	½
Floor, underclay.				
Thickness of bed	2 10	3 7¼	3 3¾	3 5½
Thickness of coal sampled	2 10	3 7¼	3 3¾	3 5½

a Contains streaks of mother coal.

Section A (sample 19293) was measured at face of main south entry, 3,000 feet from shaft bottom. Section B (sample 19294) was cut from face of 8 west entry, south entry, 3,000 feet from shaft bottom. Section C (sample 19295) was cut from face of 1 north entry, 6 west entry, 3,500 feet from shaft bottom. Section D (sample 19296) was cut from face of main 6 west entry, 4,060 feet from shaft bottom.

The ultimate analysis of a composite sample made by combining equal amounts of samples 19293, 19294, 19295, and 19296 is given under laboratory No. 19297.

The mine is worked on the double-entry, room-and-pillar system, through a shaft 50 feet deep. In 1914 the coal was undercut with electric chain machines and the machine cuttings were loaded out with the coal. About two-thirds of the coal was recovered in advance work. Daily output, 200 tons; maximum day's run, 318 tons.

CRITTENDEN COUNTY.

SULLIVAN. BARNABY MINE.

Analysis 22894 (p. 42). Bituminous coal, western Kentucky field, from Barnaby mine, 3 miles west of Sullivan. Coal bed, not named; Carboniferous age, Pottsville group. The bed was sampled on September 18, 1915, by Wallace Lee, as shown below:

Section of coal bed in Barnaby mine.

	Ft.	in.
Roof, sandy micaceous shale.		
Coal		4
"Mother coal"		1/8
Coal		10
"Mother coal"		1/8
Coal		4
Coal, hard and lustrous	1	11
"Rash"		[a] 8
Floor, clay.		
Thickness of bed	4	1 1/4
Thickness of coal sampled	3	5 1/4

[a] Not included in sample.

The sample was taken 200 feet east of opening.

SULLIVAN. NEWCOME MINE.

Analysis 22895 (p. 42). Bituminous coal, western Kentucky field, from Newcome mine, 3 miles east of Sullivan. Coal bed, not named; Pennsylvanian age, Pottsville group. The bed was sampled on September 18, 1915, by Wallace Lee, as shown below:

Section of coal bed in Newcome mine.

	Ft.	in.
Roof, micaceous sandy shale.		
Coal		5
"Mother coal"		1/8
Coal		10
"Mother coal"		1/2
Coal, hard and lustrous	2	2 1/2
"Rash"		[a] 10
Floor, fire clay.		
Thickness of bed	4	4 1/8
Thickness of coal sampled	3	6 1/8

[a] Not included in sample.

The sample was cut 500 feet northeast from opening.

DAVIESS COUNTY.

OWENSBORO. FULKERSON MINE.

Analyses 18970, 18971, and 18972 (p. 42–43). Bituminous coal, western Kentucky field, from Fulkerson mine, a slope mine 3 miles northwest of Owensboro; no railroad connections. Coal bed, No. 9 of the Kentucky geological survey; Carboniferous age, Pottsville group. Bed, 4 feet 6 inches thick; contains thin bands of "sulphur." Roof, black shale, 2 to 4 feet thick. Floor, clay, which weathers when exposed to air. Cover at points of sampling, about 80 feet. The bed was sampled March 24, 1914, by J. T. Ryan and A. W. Harris, as described on page following.

Sections of coal bed in Fulkerson mine.

Section	A	B
Laboratory No.	18970	18971
Roof, shale.	Ft. in.	Ft. in.
Coal, hard	8	8
Coal, with thin bands of "sulphur"	1 3	3 10½
Coal	1 1	.. ..
"Sulphur" band	½	.. ..
Coal	1 6⅝	.. ..
Floor, underclay.		
Thickness of bed	4 6½	4 6½
Thickness of coal sampled	4 6½	4 6½

Section A (sample 18970) was measured at face of 2 room, main entry, 800 feet from mouth of slope. Section B (sample 18971) was measured at 1 room, main entry, 800 feet from mouth of slope.

The ultimate analysis of a composite sample made by combining equal amounts of samples 18970 and 18971 is given under laboratory No. 18972.

The mine had an output of 10 tons per day.

Owensboro. George Rudy Mine.

Analyses 18958, 18959, 18960, and 18961 (p. 43). Bituminous coal, western Kentucky field, from George Rudy mine, a shaft mine 3 miles west of Owensboro; no railroad connections. Coal bed, No. 9 of Kentucky geological survey; Carboniferous age, Pottsville group. Bed, 4 feet to 4 feet 6 inches thick; is free from shale partings, but contains three or more "sulphur" bands. Roof, black shale; floor, underclay. Cover at points of sampling, about 110 feet. The bed was sampled March 23, 1914, by A. W. Harris and A. F. Crider, as described below:

Sections of coal bed in George Rudy mine.

Section	A	B	C
Laboratory No.	18958	18959	18960
Roof, shale.	Ft. in.	Ft. in.	Ft. in.
Coal	[a] 4	[a] 4	[a] 4
Coal	8	10½	8
"Sulphur"	[a] 1	⅜	½
Coal	2 0	5½	4½
"Sulphur"	Streak.	2½	[a] 1½
Coal, with streaks of "sulphur"	10½	2 6½	[b] 1 8½
Coal and "sulphur"	[a] 1	.. ..	1½
Coal	7	.. ..	11½
Floor, underclay.			
Thickness of bed	4 7½	4 5⅜	4 3
Thickness of coal sampled	4 1½	4 1⅜	3 10½

[a] Not included in sample. [b] Clean.

Section A (sample 18958) was measured at face of 6 north entry, 2,000 feet from shaft bottom. Section B (sample 18959) was measured at face of 15 room, 5 north entry, 2,200 feet from shaft bottom. Section C (sample 18960) was measured at face of main west entry, 1,800 feet from shaft bottom.

The ultimate analysis of a composite sample made by combining equal amounts of samples 18958, 18959, and 18960 is given under laboratory No. 18961.

The mine is worked on the room-and-pillar system through a shaft 160 feet deep. In 1914 the coal was shot from the solid with different sizes of black powder. None of the coal was shipped as run-of-mine; 35 per cent passed through 1 and 1½ inch screens. Screens consisted of bars 10 inches long and 5 inches wide. The coal was loaded on wagons and hauled to town. One picker employed while loading. All of the coal was obtained from advance work. Daily output, 50 tons. Maximum day's run, 160 tons.

HARLAN COUNTY.

BENHAM. BENHAM MINE.

Analyses 24834 to 24838 (p. 43). Bituminous coal, eastern Kentucky field, from Benham mine, a drift mine at Benham, the terminus of the Wasiota and Black Mountain division of the Louisville & Nashville R. R. Coal bed, known as "C," or Kellioka; Carboniferous age, Pottsville group. Bed, 5 feet 2 inches to 5 feet 7 inches thick; dips southwest with cleat. Roof, "draw slate," 6 to 8 inches; above the "draw slate" is a sandstone cap rock. Floor, fairly hard smooth clay. Cover, at points of sampling, 1,600 feet. Rolls or horsebacks are frequent. The bed was sampled by E. B. Sutton on March 30, 1916, as described below:

Sample 24834 was taken at face of 3 right entry, 1 left entry, face heading, and represented 4 feet 9 inches of coal. Sample 24835 was taken at face of 3 room, 2 right entry, 2 left entry, face heading, and represented 5 feet 2 inches of coal. Sample 24836 was taken at face of 8 room, 1 left entry, 2 right entry, face heading, and represented 5 feet 1½ inches of coal. Sample 24837 was taken at face of 7 room, 3 left entry, 1 right entry, face heading, and represented 5 feet 7 inches of coal. Each sample represents the thickness of the bed at the place sampled. The roof was "draw slate;" the floor was clay.

The ultimate analysis of a composite sample, made by combining face samples 24834, 24835, 24836, and 24837, is given under laboratory No. 24838.

The mine is worked on the panel, room-and-pillar system. In 1916 the coal was undercut with machines and was shot down with permissible explosives at any time during the shift; dynamite was used for brushing the roof. About 55 per cent of the coal was from advance work. Total recovery was 98 per cent. The average daily output was 1,650 tons.

The "B" bed, which is about 4 feet thick, is 20 to 30 feet below the "C" bed. The "D" bed, which is 28 to 30 inches thick, is about 70 feet above the "C" bed.

HARLAN. CLOVER FORK MINE.

Analyses 24728 to 24732 (p. 43). Bituminous coal, eastern Kentucky field, from Clover Fork mine, a drift mine 2 miles east of Harlan, on the Louisville & Nashville R. R. Coal bed, Harlan; Carboniferous age, Pottsville group. Bed 3 feet 8 inches to 4 feet thick. Roof, "draw slate" overlain by sandstone cap rock; floor, soft, rough shale. Cover at point of sampling, 1,500 feet. The bed was sampled by E. B. Sutton on March 18, 1916, as described below:

Sections of coal bed in Clover Fork mine.

Section	A		B		C		D	
Laboratory No.	24728		24729		24730		24731	
Roof, shale.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Coal		4½		5½		5		4
Splint coal		2		2		1½		1½
Coal	3	1½	3	4½	3	3½	3	2
Floor, soft shale.								
Thickness of bed	3	8	4	0	3	10	3	7½
Thickness of coal sampled	3	8	4	0	3	10	3	7½

Section A (sample 24728) was cut from 25 pillar, 7 left entry. Section B (sample 24729) was cut at face of 7 left air course. Section C (sample 24730) was cut at face of 9 left entry. Section D (sample 24731) was cut at face of 7 right entry.

The ultimate analysis of a composite sample, made by combining face samples 24729, 24730, and 24731, are given under laboratory No. 24732.

The room-and-pillar system of mining is used. In 1916 the coal was undercut with machines and shot down with black blasting powder by the miners during the shift.

The daily output was about 1,000 tons, and was expected to be doubled soon. Track capacity, 45 empty and 40 loaded cars. The probable lifetime of the mine was about 15 years.

HARLAN. COXTON MINE.

Analyses 24713 to 24717 (p. 43). Bituminous coal, eastern Kentucky field, from Coxton mine, a drift mine at Coxton, 4 miles east of Harlan on the Louisville & Nashville R. R. Coal bed, Harlan; Carboniferous age, Pottsville group. Bed 3½ to 4½ feet thick. Roof in west side of mine is thin "draw slate," weak in places; in the east side the roof is hard shale. Floor, hard, rough shale. The Wallens bed lies about 800 feet above this bed. Cover at points where samples were taken, 1,300 feet. The bed was sampled by E. B. Sutton on March 23, 1916, as described below:

Sections of coal bed in Coxton mine.

Section	A		B		C		D	
Laboratory No.	24713		24714		24715		24716	
Roof, shale.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Coal		5½		6		5		4
Splint coal		3¼		3		3		2½
Coal	3	6½	3	8	3	2½	3	3
Floor, hard shale.								
Thickness of bed	4	3½	4	5	3	10½	3	9½
Thickness of coal sampled	4	3¼	4	5	3	10½	3	9½

Section A (sample 24713) was taken from face of 22 room, 1 right entry. Section B (sample 24714) was taken from face of 17 room, 4 right entry. Section C (sample 24715) was taken from face of 5 left entry. Section D (sample 24716) was taken from face of 2 room, 3 left entry.

The ultimate analysis of a composite sample made by combining face samples 24713, 24714, 24715, and 24716 is shown under laboratory No. 24717.

The entry, room-and-pillar system of mining is used. In 1916 the coal was undercut with machines and was shot down with black powder and dynamite. The coal breaks in large lumps. Practically none of the coal was shipped as run-of-mine. There were three loading tracks with a capacity of 40 empty and 35 loaded cars. The daily output was about 1,000 tons. The probable lifetime of the mine was 20 years.

HARLAN. GASTON MINE.

Analyses 24633, 24634, and 24635 (p. 43). Bituminous coal, eastern Kentucky field, from Gaston mine, 1 mile east of Harlan, on the Louisville & Nashville R. R. Coal bed, Harlan; Carboniferous age, Pottsville group. The bed, including bottom shale and coal, is about 6 feet thick. Roof, 1 to 6 inches of tender "draw slate;" floor, soft, irregular fire clay. Cover at point of sampling, 750 feet. The bed was sampled by E. B. Sutton on March 14, 1916, as described below:

Sections of coal bed in Gaston mine.

Section	A		B	
Laboratory No.	24633		24634	
Roof, shale.	*Ft.*	*in.*	*Ft.*	*in.*
Coal		2		1½
Splint coal		5		2¼
Coal	3	8	3	9
Shale		*a* 11		*a* 11
Coal	*a* 1	1	*a* 1	1½
Floor, soft shale.				
Thickness of bed	6	3	6	1½
Thickness of coal sampled	4	3	4	¾

a Not included in sample. Only mined in main haulage way to get height of entry.

Section A (sample 24633) was taken at face of 4 right entry. Section B (sample 24634) was taken at face of main haulage way.

The ultimate analysis of a composite sample, made by combining face samples 24633 and 24634, is shown under laboratory No. 24635.

The room-and-pillar system of mining is used. In 1916 the coal was undercut with machines and was shot down with black blasting powder of mixed grades. The coal is practically all screened. There were three loading tracks with a capacity of 38 loaded and 36 empty cars. The daily output was 900 tons. It was expected to increase the output to 1,200 or 1,500 tons. About 75 per cent of the coal was from advance workings; 90 per cent of the coal was recovered. There was about 525 acres to be mined from this opening. The probable lifetime of the mine was 20 years.

HARLAN. WOOD MINE.

Analyses 24770 to 24773 (p. 43). Bituminous coal, eastern Kentucky field, from Wood mine, a drift mine 3 miles east of Harlan, at Black Joe, on the Louisville & Nashville R. R. Coal bed, Harlan; Carboniferous age, Pottsville group. Bed is 3 to 4 feet thick. It is broken more or less by local rolls. Occasional "sulphur" streaks are the only impurities encountered. Roof, tender "draw slate," 10 to 12 inches thick; floor, hard, rough clay. Cover at point of sampling, 1,200 feet. The bed was sampled by E. B. Sutton on March 25, 1916, as described below:

Sample 24770 was taken at face of 5 right entry and represented 3 feet 2 inches of coal, the thickness of the bed. Section B (sample 24771) was taken at the face of 3 right air course and represented 3 feet 3 inches of coal, the thickness of the bed. Section C (sample 24772) was taken at face of 4 right entry and represented 3 feet 4½ inches of coal; there was 2 inches of splint coal above the part sampled.

The ultimate analysis of a composite sample made by combining face samples 24771 and 24772 is shown under laboratory No. 24773.

The mine is worked by the double-entry, room-and-pillar system. In 1916 the coal was undercut with chain machines and shot down with FF black powder. Electric haulage locomotives are used. The average daily output was 250 tons, practically all of which came from advance workings. There were three loading tracks with a capacity of 25 empty and 20 loaded cars.

HENDERSON COUNTY.

BASKETT. NO. 1 MINE.

Analyses 18962 to 18966 (p. 44). Bituminous coal, western Kentucky field, from No. 1 mine, a shaft mine at Baskett, on the Louisville, Henderson & St. Louis Ry. Coal bed, No. 9 of Kentucky geological survey; Carboniferous age, Pottsville group Bed is 3 feet 10 inches thick; it contains numerous streaks of "sulphur." Roof, gray shale; floor, underclay. Cover at points of sampling, about 140 feet. The bed was sampled by J. T. Ryan and A. W. Harris on March 25, 1914, as described below:

Sections of coal bed in No. 1 mine.

Section	A	B	C	D
Laboratory No.	18962	18963	18964	18965
Roof, gray shale.				
Coal, hard	Ft. in. 7	Ft. in. 8	Ft. in. 7	Ft. in. 1 1
"Sulphur" and "mother coal"	Streak.	[a] 1	¼	⅛
Coal	1 7	5	.. ..	.. ..
"Sulphur" and "mother coal"	½	¼	.. ..	.. ..
Coal streaked with "sulphur"	1 6	1 0	1 0	1 4
"Mother coal" and coal	.. ..	4	.. ..	⅜
Coal	.. ..	1 4	2 2¾	1 3½
Floor, underclay.				
Thickness of bed	3 8½	3 10¼	3 10	3 9
Thickness of coal sampled	3 8½	3 9¼	3 10	3 9

[a] Not included in sample.

Section A (sample 18962) was measured at face of main south entry, 3,000 feet from shaft. Section B (sample 18963) was measured at face of 1 west entry, main south entry, 1,400 feet from shaft. Section C (sample 18964) was measured at face of 29 room, 2 east south entry, 3,500 feet from shaft. Section D (sample 18965) was measured at face of main north entry, 2,600 feet from shaft.

The ultimate analysis of a composite sample made by combining equal amounts of samples 18962, 18963, 18964, and 18965 is shown under laboratory No. 18966.

The mine is worked on the room-and-pillar system. In 1914 the daily output was 500 tons.

CORYDON. CORYDON MINE.

Analyses 19103 to 19107 (p. 44). Bituminous coal, western Kentucky field, from Corydon mine, a shaft mine at Corydon, on the Illinois Central R. R. Coal bed, No. 12; Carboniferous age, Pottsville group. Bed 5 feet thick; occasional rolls and horsebacks are encountered. Cover at points of sampling, about 185 feet. The bed was sampled by A. W. Harris and A. W. Crider on April 6, 1914, as described below:

Sections of coal bed in Corydon mine.

Section	A	B	C	D
Laboratory No.	19103	19104	19105	19106
Roof, gray shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal, hard	1 8¼	2 11	4¼	3 2½
"Mother coal," hard	.. ..	.. ..	a 1½	Streak.
Coal, hard	.. ..	.. ..	6½	1½
"Mother coal" and "sulphur"	a 2	.. ..	½	½
Coal	1 2½	.. ..	2 6½	9½
"Mother coal" and "sulphur"	a 2	1½	a 1	½
Coal	1 7	1 11½	1 2	4
Floor, soft underclay.				
Thickness of bed	4 9¾	5 0	4 10½	4 6½
Thickness of coal sampled	4 5¾	5 0	4 8	4 6½

a Not included in sample.

Section A (sample 19103) was measured at face of 8 room, 2 south entry, 1,000 feet from shaft. Section B (sample 19104) was measured at face of 8 room, 2 north entry, 1,000 feet from shaft. Section C (sample 19105) was measured at face of 1 north entry, 800 feet from shaft. Section D (sample 19106) was measured at face of 2 south entry, 1,000 feet from shaft.

The ultimate analysis of a composite sample made by combining equal amounts of samples 19103, 19104, 19105, and 19106 is shown under laboratory No. 19107.

The mine is worked on the room-and-pillar system. In 1914 the coal was shot from the solid. Particles of roof and floor became mixed with the coal in loading. Daily output about 50 tons.

HENDERSON. NICHOLSON MINE.

Analyses 18973, 18974, and 18975 (p. 44). Bituminous coal, western Kentucky field, from Henderson mine, a shaft mine 1¼ miles south of Henderson. No railroad connection. Coal bed, No. 9 of Kentucky geological survey; Carboniferous age, Pottsville group. Average thickness of bed, 4 feet. Roof, black shale; floor, soft underclay. Cover at points of sampling, 200 feet. The bed was sampled by A. F. Crider on March 25, 1914, as described on page following.

Section of coal bed in Nicholson mine.

Section	A	B
Laboratory No.	18973	18974
Roof, black shale.	*Ft. in.*	*Ft. in.*
Coal, hard, clean	4 ½	7
"Sulphur"	.. ..	¼
Coal, soft, clean	.. ..	8
"Sulphur"	.. ..	[a] 2½
Coal	.. ..	2 8
Floor, soft underclay.		
Thickness of bed	4 ½	4 1¾
Thickness of coal sampled	4 ½	3 11¼

[a] Not included in sample.

Section A (sample 18973) was measured at 4 room, 2 west entry, 1,250 feet from shaft. Section B (sample 18974) was measured at face of 1 west entry, 1,200 feet from shaft.

The ultimate analysis of a composite sample made by combining equal amounts of samples 18973 and 18974 is shown under laboratory No. 18975.

The mine is worked on the room-and-pillar system. Daily output, 60 tons.

ROBARDS. PANAMA MINE.

Analyses 18976, 18977, and 18978 (p. 44). Bituminous coal, western Kentucky field, from Panama mine, a shaft mine three-fourths of a mile south of Robards on the Louisville & Nashville R. R. Coal bed, No. 9 of the Kentucky geological survey; Carboniferous age, Pottsville group. Bed is 4 feet thick; it contains a number of "sulphur" partings. Roof, black shale; floor, soft underclay. Cover at points of sampling, 200 feet. The bed was sampled by A. W. Harris on March 26, 1914, as described below:

Sections of coal bed in Panama mine.

Section	A	B
Laboratory No.	18976	18977
Roof, black shale.	*Ft. in.*	*Ft. in.*
Coal	.. ..	[a] 3
Coal, hard	.. ..	11
"Mother coal"	.. ..	¼
Coal, soft	1 0	2 1½
"Sulphur"	Streak.	[a] 2
Coal, hard, "sulphur" streaks	3 2½	3½
Coal, bottom	.. ..	[a] 3
Bottom, soft underclay.		
Thickness of coal bed	4 2½	4 ¼
Thickness of coal sampled	4 2½	3 4¼

[a] Not included in sample.

Section A (sample 18976) was measured at face of 27 room, 3 south entry, 1,800 feet from shaft. Section B (sample 18977) was measured at face of 3 north entry, 1,600 feet from shaft.

The ultimate analysis of a composite sample made by combining equal amounts of samples 18976 and 18977 is shown under laboratory No. 18978.

The mine is worked on the room-and-pillar system. In 1914, the daily production was 50 tons.

SMITH MILLS. SMITH MILLS MINE.

Analyses 19108 to 19112 (p. 45). Bituminous coal, western Kentucky field, from Smith Mills mine, a shaft mine at Smith Mills, 5 miles from Illinois Central R. R. at Corydon. Coal bed, No. 12 of the Kentucky geological survey; Carboniferous age, Pottsville group. Average thickness, about 6 feet. Coal is rather clean except for

streaks of "mother coal" and "sulphur." Roof, hard, gray shale; floor, soft underclay. Cover at points of sampling, 180 feet. The bed was sampled by A. W. Harris and A. F. Crider on April 6, 1914, as described below:

Sections of coal bed in Smith Mills mine.

Section	A	B	C	D
Laboratory No.	19108	19109	19110	19111
Roof, gray shale.				
Coal, left up to hold roof	[a] 1 2	[a] 1 6	.. ..	.. ..
Coal, hard	11¾	3 1½	8	1 1½
"Mother coal" to "sulphur"	[a] 3½	¼	Streak.	Streak.
Coal	.. ..	2¼	1	11
"Mother coal" to "sulphur"	.. ..	.. ..	Streak.	½
Coal	3 3	.. ..	3 11	1 9½
"Mother coal"	¾	¼	Streak.	½
Coal, hard	9	1 8½	10	1 5
Floor, soft underclay.				
Thickness of bed measured [b]	6 6	6 6½	5 6	5 4
Thickness of coal sampled	5 ½	5 ½	5 6	5 4

[a] Not included in sample.
[b] Sections C and D show the thickness mined; sections A and B show total thickness of bed.

Section A (sample 19108) was measured at face of 12 room, 4 north entry, 1,200 feet from shaft. Section B (sample 19109) was measured at face of 11 room, 3 north entry, 1,100 feet from shaft. Section C (sample 19110) was cut from face of 4 room, west entry, 1,200 feet from shaft. Section D (sample 19111) was measured at face of 5 room, main north entry, 1,200 feet from shaft.

The ultimate analysis of a composite sample made by combining equal amounts of samples 19108, 19109, 19110, and 19111 is shown under laboratory No. 19112.

In 1914 the entire output was sold to local trade; daily production, 50 tons.

HOPKINS COUNTY.

Dawson Springs. J. W. Workman Mine.

Analyses 19298 to 19302 (p. 45). Bituminous coal, western Kentucky field, from J. W. Workman mine, a shaft mine 1 mile north of Dawson Springs; no railroad connection. Coal bed, locally termed Dawson; Carboniferous age, Pottsville group. Average thickness of bed, 4 feet. The coal was comparatively free from impurities, with the exception of two thin "sulphur" bands, which were shipped with the coal. Roof, dark gray shale; floor, hard, smooth underclay. Cover at points of sampling, 70 to 100 feet. The bed was sampled by A. W. Harris and A. F. Crider on April 23, 1914, as described below:

Sections of coal bed in J. W. Workman mine.

Section	A	B	C	D
Laboratory No.	19298	19299	19300	19301
Roof, gray shale.				
Coal, soft	4½	4	2 3	3
"Sulphur" band	Streak.	Streak.	¼	Streak.
Coal	1 ½	3 7	1 2	2 6
"Sulphur"	¼	.. ..	Streak.	¼
Coal, hard	2 7½	.. ..	9½	1 2
Floor, hard, smooth underclay.				
Thickness of coal	4 ¾	3 11	4 2¾	3 11¼
Thickness of coal sampled	4 ¾	3 11	4 2¾	3 11¼

Section A (sample 19298) was measured at face of main east entry, 500 feet east of shaft. Section B (sample 19299) was measured at face of 3 room, main east entry, 500 feet from shaft. Section C (sample 19300) was measured at left rib near face of 2 room, air course, 500 feet from shaft. Section D (sample 19301) was measured at right rib at face of 2 room, air course, 500 feet from shaft.

The ultimate analysis of a composite sample made by combining equal amounts of samples 19298, 19299, 19300, and 19301 is shown under laboratory No. 19302.

In 1914 the total output of this mine was sold to local trade.

EARLINGTON. No. 9 MINE.

Analyses 19204 to 19212 (p. 45). Bituminous coal, western Kentucky field, from No. 9 mine, one-half mile southeast of Earlington, on Louisville & Nashville R. R. Coal bed, No. 9; Carboniferous age, Pottsville group. Workable coal of western Kentucky is mostly in two beds, No. 9 and No. 11, of the State geological survey, No. 9 being the more persistent and furnishing by far the largest output of this field. The bed is fairly uniform and averages 4 feet 6 inches thick. The coal is free from shale and clay partings but contains a number of "sulphur" bands. Roof, hard, black shale; floor, hard, smooth underclay. The bed was sampled by A. F. Crider and A. W. Harris on April 18, 1914, as described below:

Sections of coal bed in No. 9 mine.

Section	A	B	C	D
Laboratory No.	19204	19205	19206	19207
Roof, shale.				
Coal, hard	1 1½	1 10½	1 9½	1 2
"Sulphur" band	a 2	¼	a 1½	½
Coal, hard	6¼	b 1 2	1 3	2 3½
"Sulphur" band	¼	½	Streak.	Streak.
Coal, hard	8½	b 9¼	1 4½	1 0
"Sulphur"	½	¼	.. ..	.. ..
Coal mixed with "sulphur"	2 1¼	7½	.. ..	.. ..
Floor, underclay.				
Thickness of bed	4 8¼	4 6½	4 6½	4 6
Thickness of coal sampled	4 6¼	4 6¼	4 5	4 6

Section	E	F	G	H
Laboratory No.	19208	19209	19210	19211
Roof, shale.				
Coal, hard	7½	1 4½	5½	1 5½
"Sulphur" band	a ½	½	Streak.	a 1
Coal, hard	7¼	2 ½	6½	1 10½
"Sulphur" band	a 1	Streak.	a 2	¼
Coal, hard	1 ½	1 2½	1 10	1 2¼
"Sulphur" and coal	a ½	.. ..	½	.. ..
Coal mixed with "sulphur"	2 1½	.. ..	b 1 2½	.. ..
Floor, underclay.				
Thickness of bed	4 6¾	4 8	4 3	4 7¾
Thickness of coal sampled	4 4¾	4 8	4 1	4 6¾

a Not included in sample. b Contains streaks of "mother coal" and "sulphur."

Section A (sample 19204) was measured at face of main north entry, 4,000 feet from entrance. Section B (sample 19205) was measured at face of 100 room, 7 east entry, 8,000 feet from entrance. Section C (sample 19206) was measured at rib of 16 east entry, opposite 37 room, 5,000 feet from entrance. Section D (sample 19207) was measured at face of 39 room, 13 east entry, 5,000 feet from entrance. Section E (sample 19208) was measured at rib of 92 room, 7 east entry, 7,500 feet from entrance. Section F (sample 19209) was measured at rib of 10 east entry, 65 room, 8,000 feet from entrance. Section G (sample 19210) was measured at face of 14 east entry, 5,000 feet from entrance. Section H (sample 19211) was measured at face of 62 room, 60 feet from 10 east entry, 5,000 feet from entrance.

The ultimate analysis of a composite sample made by combining equal amounts of samples 19204 to 19211 is shown under laboratory No. 19212.

In 1914 the daily output of mine was 1,000 tons.

MADISONVILLE. REINECKE MINE.

Analyses 19194 to 19203 (p. 45). Bituminous coal, western Kentucky field, from Reinecke mine, a shaft mine 1 mile west of Madisonville, on the Louisville & Nashville R. R. Coal bed, No. 11 of the Kentucky geological survey; Carboniferous age, Pottsville group. Bed is 6 feet 9 inches thick; it contains a number of "sulphur" and "mother-coal" partings, and a characteristic shale parting locally termed "blue band," 2 feet from the floor and 1¾ to 2½ inches thick. Roof, hard, black shale; floor, hard, smooth underclay. Cover at points of sampling, 265 feet. The bed was sampled by A. F. Crider and A. W. Harris on April 16 and 17, 1914, as described below:

Sections of coal bed in Reinecke mine.

Section	A	B	C	D	E
Laboratory No.	19194	19195	19196	19197	19198
Roof, black shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal, hard	[b] 1 5	1 2¾	1 1	1 4	1 1
"Sulphur" and "mother-coal" parting	a 1	a ⅜	¼	[b] ½	½
Coal	[b] 2 0	1 8½	5½	[b] 2 5⅜	1½
"Sulphur" and "mother-coal" parting	[b] ½	½	Streak.	½	½
Coal, hard	[b] 9	[b] 11½	2 10	3¾	2 10
"Blue band"	a 2	a 2	a 2½	a 1¾	a 2
Coal	2½	.. ..	.. ..	a 1½	1½
"Sulphur" parting	¼	.. ..	.. ..	½	Streak.
Coal with "sulphur" partings	.. ..	1 4	1 10	7	9
"Mother coal" with "sulphur"	1 10½	.. ..	.. ..	a 5	½
Coal, hard	.. ..	.. ..	.. ..	5½	6½
"Sulphur"	.. ..	.. ..	.. ..	Streak.	Streak.
Coal, high in "sulphur"	.. ..	[b] 8½	.. ..	a 6	9½
Floor, hard underclay.					
Thickness of bed	6 6¾	6 2⅝	6 5½	6 5	6 6½
Thickness of coal sampled	6 3¼	5 3¼	6 2¾	5 2½	6 4½

Section	F	G	H	I
Laboratory No.	19199	19200	19201	19202
Roof, black shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal adhering to roof	.. ..	a 1	.. ..	.. ..
Coal, hard, brittle	[b] 1 2½	1 2	1 4½	10¾
"Sulphur" band	a 1	a 1	a 1	¼
Coal, hard	[b] 2 2¾	.. ..	1 5½	5½
"Mother coal"	½	.. ..	½	½
Coal, hard, brittle	.. ..	2 8¼	6½	2 2½
"Sulphur" band	¼	.. ..	a ¾	a 2
Coal, hard, brittle	3¾	.. ..	10¾	4
"Blue band"	a 2½	a 2	a 1½	a 2½
Coal, hard	1 7	[b] 1 3½	.. ..	[b] 1 4½
"Sulphur"	.. ..	Streak.	.. ..	a 1½
Coal, hard, with "sulphur" balls	a 3½	7	2 2	4½
Floor, hard underclay.				
Thickness of bed	5 11¾	6 ½	6 8¾	6 2½
Thickness of coal sampled	5 4¼	5 8½	6 5½	5 8½

[a] Not included in sample. [b] Contains streaks of "sulphur" or "mother coal."

Section A (sample 19194) was cut from face of 8 west entry, main north entry, 1¾ miles from shaft. Section B (sample 19195) was cut from face of 10 west entry, 1¾ miles from shaft. Section C (sample 19196) was cut from face of 15 room, 5 west entry, 1½ miles from shaft. Section D (sample 19197) was cut from face of main north entry, 1¼ miles from shaft. Section E (sample 19198) was cut from face of 12 west entry, at junction of 1 south entry, 1¼ miles from shaft. Section F (sample 19199) was cut from face of 1 room, 16 east entry, main south entry, 2 miles from shaft. Section G (sample 19200) was cut from face of 8 room, 16 east air course, 1¾ miles southeast of shaft. Section H (sample 19201) was cut from rib of 6 west entry, opposite 8 room, 1½ miles from shaft. Section I (sample 19202) was cut from face of 14 west entry, 20 room, 2 miles southwest of shaft.

The ultimate analysis of a composite sample made by combining equal amounts of samples 19194 to 19202 is given under laboratory No. 19203.

The mine is worked on the room-and-pillar system. In 1914 average daily production was 1,000 tons.

NEBO. NEBO MINE.

Analyses 19230 to 19236 (p. 46). Bituminous coal, western Kentucky field, from Nebo mine, a shaft mine 3 miles south of Nebo, on a spur of Louisville & Nashville R. R. Coal bed, No. 14 of Kentucky geological survey; Carboniferous age, Pottsville group. Bed dips 1 to 3 per cent north; averages 6 feet 4 inches thick. In mining, 1 to 1½ feet of seemingly good coal was left up to protect the weak, gray shale roof. The bottom 8 inches of the bed was a dirty coal locally termed "rash," which was very high in ash, and was not included in the samples. The floor was hard, smooth underclay. Cover at points of sampling, 75 to 100 feet. The bed was sampled by A. W. Harris and A. F. Crider on April 15, 1914, as described below:

Sections of coal bed in Nebo mine.

Section	A	B	C	D	E	F
Laboratory No.	19230	19231	19232	19233	19234	19235
Roof, gray shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Top coal	a 1 6	a 1 2	.. ..	a 1 0	a 1 2	a 1 0
Coal	b 3 10	1 1	4 7	2 1½	3 9½	1 2
"Sulphur" band	.. ..	Streak.	Streak.	a 2½	.. ..	Streak.
Coal, hard, brittle	.. ..	b 1 7	2	2 3½	.. ..	b 5
"Sulphur" and "mother coal"	¼	½	Streak.	Streak.	a 1	Streak.
Coal	b 5¾	1 9½	1 0	7	9	b 3 5
"Rash"	a 3	a 7	a 7	a 3	a 8	a 3
Floor, hard underclay.						
Thickness of coal bed	6 1	6 3	6 4	6 5½	6 5½	6 3
Thickness of coal sampled	4 4	4 6	5 9	5 0	4 6½	5 0

a Not included in sample. b Contains streaks of "mother coal" or "sulphur."

Section A (sample 19230) was cut from last cut-through, 2 east entry, north entry, 3,000 feet from entrance. Section B (sample 19231) was cut from face of 15 room, 1 east entry, 3,000 feet from entrance. Section C (sample 19232) was cut from rib of 5 room, 1 north entry, 3,000 feet from entrance. Section D (sample 19233) was cut from face of 2 room, 3 east entry, north entry, 3,200 feet from entrance. Section E (sample 19234) was cut from face of 1 west entry, 1 north entry, 3,400 feet from entrance. Section F (sample 19235) was cut from 2 east break-through, 40 feet from intersection of 4 east and north entries, 3,600 feet from entrance.

The ultimate analysis of a composite sample made by combining equal amounts of samples 19230 to 19235 is given under laboratory No. 19236.

In 1914 the coal was undercut with electric chain coal-cutting machines. Particles of roof and floor did not become mixed with coal in loading. Daily output, 700 tons. Maximum day's run, 800 tons.

NORTONVILLE. NORTON NO. 1 MINE.

Analyses 19237 to 19243 (p. 46). Bituminous coal, western Kentucky field, from Norton No. 1 mine, a shaft mine 1,000 feet west of Nortonville station, on the Louisville & Nashville and the Illinois Central R. R. Coal bed, No. 11 of Kentucky geological survey; Carboniferous age, Pottsville group. This is one of the two important workable beds in the western part of Kentucky, the other being bed No. 9. The coal contained a shale parting, locally termed "blue band," 1½ to 2 inches thick, below the middle of the bed. Average thickness of bed, 6 feet 4 inches. Roof, limestone; floor, soft broken underclay. Cover at points of sampling, 40 to 225 feet. The bed was sampled by A. W. Harris and A. F. Crider on April 20, 1914, as described on page following.

Sections of coal bed in Norton No. 1 mine.

Section Laboratory No.	A 19237	B 19238	C 19239	D 19240	E 19241	F 19242
Roof, limestone.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal, bright	2 2¼	7	1 3	a 1 8	1 4	6½
"Sulphur" band	b ½	1	b 1	½	b ¾	½
Coal, hard	a 1 3	a 3 5	1 1	2 2	a 2 1	9½
"Mother coal" and "sulphur"	b ½	.. ..	1	b ¾	1	b ½
Coal, hard	a 7¾	.. ..	a 1 8½	4	9	2 9½
"Blue band"	b 2¾	b 1½	b 2	b 1½	b 1½	b 1½
Coal	b 1	b 1	.. ..	.. ..	a 1	b 1
"Sulphur" band	b ¼	b ¼	.. ..	.. ..	b ½	b ½
Coal streaked with "mother coal"	1 1½	.. ..	2 0	1 3	.. ..	8½
Coal with "sulphur" bands	b 1 9½	b 1 9½	.. ..	.. ..	a 1 7	b ½
Coal high in "sulphur"	b 4	.. ..	.. ..	b 7	b 4	1 2
Floor, soft underclay.						
Thickness of bed	6 5	6 1½	6 4½	6 2¾	6 5¾	6 4½
Thickness of coal sampled	5 8	5 10½	6 1½	5 5½	5 11	6 ½

a Contained small sulphur or "mother-coal" bands. b Not included in sample.

Section A (sample 19237) was cut from face of 23 room, 1 west back heading, 2,500 feet from shaft. Section B (sample 19238) was cut from face of 27 room, 2 east entry, 2,500 feet from shaft. Section C (sample 19239) was cut from face of 23 room, 2 west entry, 3,000 feet from shaft. Section D (sample 19240) was cut from face of 2 east entry air course, 3,000 feet east of shaft. Section E (sample 19241) was cut from face of 25 room, 1 west entry, 2,500 feet west of shaft. Section F (sample 19242) was cut from face of 2 west entry, 3,000 feet west of shaft.

The ultimate analysis of a composite sample made by combining equal amounts of samples 19237, 19238, 19239, 19240, 19241, and 19242 is shown under laboratory No. 19243.

The mine is worked by the room-and-pillar system. In 1914 daily production was 700 tons.

St. Charles. Carbondale No. 1 Mine.

Analyses 19261 to 19267 (pp. 46–47). Bituminous coal, western Kentucky field, from Carbondale No. 1 mine, a drift mine 2 miles northwest of St. Charles on spur of Illinois Central R. R. Coal bed, No. 9 of the Kentucky geological survey; Carboniferous age, Pottsville group. Bed averages 4 feet 6 inches thick, dips 2 per cent north. No faults, rolls, or horsebacks had been encountered. Roof, hard, black shale; floor, hard, smooth underclay. Cover at points of sampling, 40 to 60 feet. The bed was sampled by A. F. Crider and A. W. Harris on April 22, 1914, as described below:

Section of coal bed in Carbondale No. 1 mine.

Section Laboratory No.	A 19261	B 19262	C 19263	D 19264	E 19265	F 19266
Roof, black shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal, hard, clean	1 5½	1 3	1 1	1 2	1 1	1 0
"Sulphur" band	a 1½	Streak.	a 2	Streak.	a 1	¼
Coal, hard, clean	10	.. ..	1 6½	.. ..	.. ..	1 2¼
Coal, streaked with "mother coal"	6	2 9	½	2 10½	3 3	2 4½
Coal, hard, clean	1 3	.. ..	3	.. ..	.. ..	.. ..
"Sulphur" band	Streak.	Streak.	a 1	¼	.. ..	.. ..
Coal, hard	9	7½	1 5	5	.. ..	.. ..
Floor, underclay.						
Thickness of bed	4 11	4 7½	4 7	4 5¾	4 5	4 7¼
Thickness of coal sampled	4 9½	4 7½	4 4	4 5¾	4 4	4 7¼

a Not included in sample.

Section A (sample 19261) was cut from face of 7 west entry, 6 north entry, 4,500 feet from entrance. Section B (sample 19262) was cut from face of 3 main north entry, 2,000 feet from entrance. Section C (sample 19263) was cut from neck of 12 room,

6 east entry, 3 north entry, 2,000 feet from entrance. Section D (sample 19264) was cut from face of 3 east entry, 3 north entry, 3,000 feet from entrance. Section E (sample 19265) was cut from face of 22 room, 3 east entry, 3 north entry, 3,000 feet from entrance. Section F (sample 19266) was cut from face of 9 room, 5 east entry, 5 north entry, 5,000 feet from entrance.

The ultimate analysis of a composite sample made by combining equal amounts of face samples 19261 to 19266 is shown under laboratory No. 19267.

The mine is worked on the room-and-pillar system. In 1914 the coal was undercut in the coal with compressed-air punching machines. Particles of roof and floor did not mix with the coal in loading. Room and entry pillars were being pulled; about 67 per cent of the coal was taken in advance work. Daily average output, 450 tons; maximum day's run, 600 tons.

St. Charles. Fox Run Mine.

Analyses 19252 to 19260 (p. 47). Bituminous coal, western Kentucky field, from Fox Run mine, 2 miles northeast of St. Charles on spur of the Illinois Central R. R. Coal bed, No. 9 of the Kentucky geological survey; Carboniferous age, Pottsville group. Bed is 4 feet 10 inches thick, contains a number of "sulphur" and mother coal partings. Roof, black shale; floor, hard smooth underclay. Cover at points of sampling, 30 to 100 feet. The bed was sampled by A. W. Harris and by A. F. Crider on April 21, 1914, as described below:

Sections of coal bed in Fox Run mine.

Section	A	B	C	D
Laboratory No.	19252	19253	19254	19255
Roof, hard black shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal adhering to roof	[a] 1	[a] 1	.. ..	.. ..
Coal	1	[b] 1 2½	5½	[b] 1 9
"Sulphur" parting	Streak.	[a] ½	Streak.	½
Coal	7½	[b] 3¾	.. ..	.. ..
"Sulphur" and "mother coal"	½	½	.. ..	.. ..
Coal	[b] 6	1 3½	[b] 4 7	[b] 2 0
"Sulphur" and "mother coal"	½	[a] 1	.. ..	¼
Coal	[b] 3 7	1 11	.. ..	10
Floor, hard smooth clay.				
Thickness of bed	4 11	4 11½	5 ¼	4 7¾
Thickess of coal sampled	4 10	4 9	5 ¼	4 7¾

Section	E	F	G	H
Laboratory No.	19256	19257	19258	19259
Roof, black shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal adhering to roof	.. ..	.. ..	[a] 1	.. ..
Coal, hard	7	1 3½	1 5	1 2½
"Sulphur" parting	Streak.	¼	1	Streak.
Coal, hard	8	1 2½	9½	1 8½
Coal high in "sulphur"	¾	2	.. ..	.. ..
Coal, hard	6	1 3	.. ..	.. ..
"Mother coal" and "sulphur"	½	Streak.	½	¾
Coal, hard	1 2	5½	[b] 2 5	1 0
"Sulphur" parting	¼	Streak.	.. ..	Streak.
Coal, hard	1 10½	4½	.. ..	9½
Floor, hard smooth clay.				
Thickness of coal bed	4 11	4 9¼	4 10	4 9¼
Thickness of coal sampled	4 11	4 9¼	4 9	4 9¼

[a] Not included in sample. [b] Contained "mother-coal" and "sulphur" parting.

Section A (sample 19252) was cut from face of 40 room, 10 east entry, 3,500 feet from entrance. Section B (sample 19253) was cut from face of 11 room, 12 east entry, 3,000 feet from entrance. Section C (sample 19254) was cut from face of 9 west entry, 3,500 feet from entrance. Section D (sample 19255) was cut from face of 7 west entry, 3,500 feet from entrance. Section E (sample 19256) was cut from rib of 35 room, 10 east entry, 3,500 feet southeast of entrance. Section F (sample 19257) was cut from

rib of 9 room, 13 east entry, 3,000 feet from entrance. Section G (sample 19258) was cut from face of 15 east entry, 3,000 feet from entrance. Section H (sample 19259) was cut from face of 2 room, 7 west entry, 3,000 feet from entrance.

The ultimate analysis of a composite sample made by combining equal amounts of samples 19252 to 19259, inclusive, is shown under laboratory No. 19260.

The mine is worked on the room-and-pillar system. In 1914 daily production was 1,000 tons.

KNOX COUNTY.

BRADEL. BENNETT NO. 1 MINE.

Analyses 21537 to 21541 (p. 47). Bituminous coal, eastern Kentucky field, from Bennett No. 1 mine, a drift mine at Bradel, on the Cumberland Valley R. R. Coal bed, Dean; Carboniferous age, Pottsville group. Bed is about 6 feet thick and lies flat; it has a flinty clay parting, averaging 5 inches thick. Roof, "draw slate," 3 feet thick; floor, soft clay. The bed was sampled by G. T. Powell on March 16, 1915, as described below:

Sections of coal bed in Bennett No. 1 mine.

Section	A	B	C	D
Laboratory No	21537	21538	21539	21540
Roof, draw slate.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	2 1	1 11	2 2	1 11
Coal, hard	4	2	1	6
Coal	5½	2½	6	7
Coal, hard	1⅛	4	.. ..	.. ..
Coal	1½	7	.. ..	.. ..
Flinty clay	[a] 7	[a] 5½	[a] 6	[a] 6
Coal	7	9	7	6
Coal, hard	5	1½	3	5
Coal	2 0	1 9	1 2	1 9
Coal, hard	.. ..	.. ..	1	.. ..
Coal	.. ..	.. ..	4	.. ..
Floor, soft clay.				
Thickness of bed	6 8½	6 3½	5 8	6 2
Thickness of coal sampled	6 1½	5 10	5 2	5 8

[a] Not included in sample.

Section A (sample 21537) was cut from face of main entry, 2,400 feet from mine opening. Section B (sample 21538) was cut from face of 4 left entry, 2,000 feet from mine opening. Section C (sample 21539) was cut from face of 5 left entry, 2,500 feet from mine opening. Section D (sample 21540) was cut from face of 2 right entry, 2,000 feet from mine opening.

The ultimate analysis of a composite sample made by combining face samples 21537, 21538, 21539, and 21540 is shown under laboratory No. 21541.

The room-and-pillar system of mining is used. In 1915 the coal was undercut with puncher machines and shot down with FFF black blasting powder. About 30 per cent of the coal is screened. The output was about 300 to 500 tons per day, 45 per cent of which was from advance workings, and 20 per cent from pillars. There were about 60 acres to be mined. The bed where sampled is under heavy cover.

ELYS. NEW HUGHES MINE.

Analyses 21542 to 21546 (p. 47). Bituminous coal, eastern Kentucky field, from New Hughes mine, a drift mine one-half mile northeast of Ely station, on the Louisville & Nashville R. R. Coal bed, Jellico; Carboniferous age, Pottsville group. The thickness of workable coal varies from 3 to 8 feet, lies flat, and contains a distinct clay parting. Roof, firm shale 3 feet thick; floor, soft clay. The bed was sampled by G. T. Powell on March 17, 1915, as described on page following.

Sections of coal bed in New Hughes mine.

Section	A	B	C	D
Laboratory No.	21542	21543	21544	21545
Roof, shale.				
Coal	1 1	2 4	1 ½	2
"Mother coal"	½	.. ..	.. ..	.. ..
Hard coal	2½	.. ..	2½	2
Clay	.. ..	a 5	.. ..	.. ..
Coal	6	1 2½	7	7
"Mother coal"	.. ..	½	.. ..	.. ..
Shale	a 5	.. ..	a 1½	a 2
Coal	1 9	1 4	2½	1 11
"Mother coal"	.. ..	.. ..	½	.. ..
Coal	.. ..	.. ..	1 10	.. ..
Floor, soft clay.				
Thickness of bed	4 0	5 4	4 ½	3 0
Thickness of coal sampled	3 7	4 11	3 11	2 10

a Not included in sample.

Section A (sample 21542) was cut in 5 room, butt entry, 1 mile from mine opening. Section B (sample 21543) was cut at face of main left entry, 1 mile from mine opening. Section C (sample 21544) was cut at face of main right entry, 3,000 feet from mine opening. Section D (sample 21545) was cut at face of 2 left entry, Sandy branch entry, 3,000 feet from mine opening.

The ultimate analysis of a composite sample made by combining face samples 21542, 21543, 21544, and 21545 is shown under laboratory No. 21546.

The room-and-pillar system of mining is used. In 1915 the coal was undercut with machines and shot down with black powder during the shift. The mine opening is 370 feet vertically above the tipple; an incline 1,200 feet long is used to convey the coal down. The coal was dumped into a monitor holding about 10 tons, a drum 10 feet in diameter, with friction brakes, being used. The coal was all shipped as run-of-mine. The lumps were small. The output was about 400 tons per day, 60 per cent of which was from advance workings and 20 per cent from pillars. Maximum day's run, 500 tons. There were still about 162 acres to be mined. Track capacity, 50 empty and 50 loaded cars.

LAUREL COUNTY.

East Barnstead. Bonar Mine.

Analyses 21429 to 21433 (p. 47). Bituminous coal, eastern Kentucky field, from Bonar mine, a drift or slope mine 1½ miles northeast of East Barnstead, on the Louisville & Nashville R. R. Coal bed, No. 1; Carboniferous age, Pottsville group. Bed is about 3 feet thick; dips 2° E. Roof, shale; floor, soft clay. Cover at points of sampling, 100 feet. The bed was measured and sampled by G. T. Powell on March 13, 1915, as described below:

Section A (sample 21429) was cut at face of main entry, 2,000 feet from mine opening, and represented 2 feet 7½ inches of coal. Section B (sample 21430) was cut at face of 3 right entry, 1,800 feet from mine opening, and represented 3 feet 1 inch of coal. Section C (sample 21431) was cut at face of 2 right entry, 1,700 feet from mine opening, and represented 3 feet 1 inch of coal. Section D (sample 21432) was cut at face of 1 right entry, 1,500 feet from mine opening, and represented 2 feet 10 inches of coal. Each sample represented the thickness of the bed where sampled.

The ultimate analysis of a composite sample made by combining face samples 21429, 21430, 21431, and 21432 is shown under laboratory No. 21433.

The room-and-pillar system of mining is used. In 1915 the coal was shot off the solid with FF black blasting powder. The coal is all shipped as run-of-mine. The output was about 250 tons per day, 45 per cent of which was from advance workings. There were about 200 acres to be mined.

PITTSBURGH. ACME MINE.

Analyses 21339 to 21343 (pp. 47–48). Bituminous coal, eastern Kentucky field, from Acme mine, a drift mine; 1½ miles east of Pittsburgh, on the Louisville & Nashville R. R. Coal bed, No. 1; Carboniferous age, Pottsville formation. Bed is 2½ to 3½ feet thick, and lies flat. Roof, hard shale about 3 feet thick, overlain by 20 feet of hard and soft shale; floor, clay. Cover at points sampled, 90 to 140 feet. The bed was sampled by G. T. Powell on March 12, 1915, as described below:

Sections of coal bed in Acme mine.

Section	A	B	C	D
Laboratory No.	21339	21340	21341	21342
Roof, hard shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal	1 1	1 2	2 6½	2 9
Shale, hard	[a] 5	[a] 4	.. ..	.. ..
Coal	1 8	1 10½	.. ..	.. ..
Floor, clay.				
Thickness of bed	3 2	3 4½	2 6½	2 9
Thickness of coal sampled	2 9	3 ½	2 6½	2 9

[a] Not included in sample.

Section A (sample 21339) was cut at face of 1 left entry, 1,900 feet from mine opening. Section B (sample 21340) was cut at face of main entry, 2,000 feet from mine opening. Section C (sample 21341) was cut at face of 3 right entry, 1,800 feet from mine opening. Section D (sample 21342) was cut at face of 2 right entry, 1,600 feet from mine opening.

The ultimate analysis of a composite sample, made by combining face samples 21339, 21340, 21341, and 21342, is shown under laboratory No. 21343.

Room-and-pillar system of mining is used. In 1915 the average daily output was 300 tons.

LETCHER COUNTY.

FLEMING. ELKHORN NO. 301 MINE.

Analyses 21308 to 21312 (p. 48). Bituminous coking coal, eastern Kentucky field from Elkhorn No. 301 mine, a drift mine having three openings, near Fleming, on the Lexington and Eastern division of the Louisville & Nashville R. R. Coal bed, Elkhorn; Carboniferous age, Pottsville group. Bed is 8 feet thick, and dips 1° N. The bed is overlain by shale; in mining 1 to 2 feet of coal is left up for roof: the floor is hard clay. The bed was sampled by G. T. Powell on March 3, 1915, as described below:

Sections of coal bed in Elkhorn No. 301 mine.

Section	A	B	C	D
Laboratory No.	21308	21309	21310	21311
Roof, shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal, not mined	(a)	(a)	(a)	[b] 5
Coal	1 4	1 9	[b] 1 5	[b] 3
Shale	3	2	[b] 5	[b] 9
Coal	9	9	[b] 4	[b] 3
Coal	.. ..	.. ..	1 11	.. ..
Coal, hard	4	4	.. ..	.. ..
"Dirt"	.. ..	.. ..	[b] 1	.. ..
Coal	1 3	1 3	9	.. ..
Shale	.. ..	.. ..	.. ..	[b] 10
Coal, hard	2	1	4	.. ..
Coal	1 0	1 3	2 3	9
"Mother coal"	.. ..	.. ..	.. ..	½
Coal	.. ..	.. ..	.. ..	11½
"Dirt"	.. ..	.. ..	.. ..	[b] 2
Coal	.. ..	.. ..	.. ..	1 0
Coal, hard	.. ..	.. ..	.. ..	3
Coal	.. ..	.. ..	.. ..	1 9
Floor, hard clay.				
Thickness of bed	5 1	5 7	7 6	7 57
Thickness of coal sampled	4 10	5 5	5 3	5

[a] Not measured; about 2 feet thick. [b] Not included in sample.

Section A (sample 21308) was cut from face of 4 room, 2 left heading, 1,300 feet from opening. Section B (sample 21309) was cut from face of main right heading,

1,900 feet from opening. Section C (sample 21310) was cut from face of 17 room, gap entry, 1,800 feet from opening. Section D (sample 21311) was cut from face of gap entry, 1,900 feet from opening.

The ultimate analysis of a composite sample, made by combining face samples 21308, 21309, 21310, and 21311, is shown under laboratory No. 21312.

The room-and-pillar panel system of mining is used. In 1915 the coal was overcut with machines, and shot down with permissible explosives during the shift. The coal was all shipped run-of-mine. The output was about 550 tons per day, all of which was from advance workings. There was about 775 acres to be mined.

McRoberts. Consolidation No. 213 Mine.

Analyses 21294 to 21298 (p. 48). Bituminous coking coal, eastern Kentucky field, from Consolidation No. 213 mine, a drift mine at McRoberts, on a branch of the Louisville & Nashville R. R. Coal bed, Elkhorn; Carboniferous age, Pottsville group. Bed is 12 feet thick, and dips 3° NW. The bed is overlain by 30 feet of shaly sandstone; in mining 2 feet of coal is left up for roof. The floor is hard clay. There was about 140 feet of cover over the bed where mined. The bed was sampled by G. T. Powell on March 5, 1915, as described below:

Sections of coal bed in Consolidation No. 213 mine.

Section	A	B	C	D
Laboratory No	21294	21295	21296	21297
Shaly sandstone left up for roof.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	[a]1 10	[a]1 4	[a]1 0	[a]1 6
Coal	1 11	2 3	1 10	9
Shale	[a]4	[a]5½	[a]11	.. ..
"Mother coal"	.. ..	.. ..	.. ..	1
Coal	1 4	10½	1 0	1 4
Coal, hard	4	10	4	.. ..
Shale	.. ..	.. ..	.. ..	[a]11
Coal	6	1 7	1 3	10
Coal, hard	1	.. ..	3	4
Coal	1 9	.. ..	10	2 1
Floor, hard clay.				
Thickness of bed	8 1	7 3½	7 5	7 10
Thickness of coal sampled	5 11	5 6	5 6	5 5

[a] Not included in sample.

Section A (sample 21294) was cut at face of 1 right entry, 1 left face heading. Section B (sample 21295) was cut at face of main entry. Section C (sample 21296) was cut at face of 1 left entry, 1 right face entry. Section D (sample 21297) was cut at face of 1 right face heading.

The ultimate analysis of a composite sample made by combining face samples 21294, 21295, 21296, and 21297 is shown under laboratory No. 21298.

The room-and pillar panel system of mining is used. In 1915 the coal bed was cut by machine in the clay or shaly band that is about 4 feet from the bottom of the bed, the coal was shot down with permissible explosives during the shift, a very small amount of explosive being required. Room bosses, 1 to every 20 miners, were employed, who saw that the shots were properly placed and tamped, and fired them by battery. The coal was mostly shipped as "run-of-mine." The rest of the coal was screened over 1½-inch bar screens. The mine was a new one. Only about 20 per cent of the coal was taken in advance work, and the room pillars had not been pulled. The average daily output was 375 tons. There was about 745 acres still unmined. The probable lifetime of the mine was estimated to be 25 years.

McRoberts. Consolidation No. 214 Mine.

Analyses 21299 to 21317 (p. 48). Bituminous coking and gas coal, eastern Kentucky field, from Consolidation No. 214 mine, a drift mine near McRoberts, on the Louisville & Nashville R. R. Coal bed, Elkhorn; Carboniferous age, Pottsville group. Bed is

6 feet thick, and lies flat. In mining about 1 foot of coal is left up for roof; the floor is hard clay. The bed was sampled by G. T. Powell on March 4, 1915, as described below:

Sections of coal bed in Consolidated No. 214 mine.

Section Analysis No.	A 21299	B 21300	C 21301	D 21317
Coal, 1 foot 6 inches, left up for roof.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	2 7	1 10	1 6	2 5
"Mother coal"	.. ..	.. ..	½	.. ..
Shale	a 3	a 3½	.. ..	a 1½
Coal	1 1	3 0	4	10
Shale	.. ..	.. ..	a 3	a 3
Coal, hard	2	3	.. ..	4
Coal	2 2	1 6	2 7	2 9
Coal, hard	.. ..	.. ..	2	.. ..
Coal	.. ..	.. ..	1 6	.. ..
Floor, clay.				
Thickness of bed	6 3	6 10½	6 4½	6 5½
Thickness of coal mined	6 0	6 7	6 1½	6 1

a Not included in sample.

Section A (sample 21299) was cut at face of 2 right heading, 2,900 feet from opening. Section B (sample 21300) was cut at face of 1 left entry, 1 right face entry, 2,400 feet from opening. Section C (sample 21301) was cut at face of 1 right face heading, 1,900 feet from opening. Section D (sample 21317) was cut at face of 2 left entry, 1 left face entry, 2,750 feet from opening.

The ultimate analysis of a composite sample made by combining face samples 21299, 21300, 21301, and 21317 is given under laboratory No. 21302.

The panel system of mining is used. In 1915 the coal was cut in the middle of the bed in a "rash" band, by machine, and was shot down with permissible explosive during the shift. The mine was new, having been opened only about two years. The output was about 300 tons per day, all of which was from advance workings. There was about 600 acres to be mined. There was about 140 feet of cover over the place where the samples were taken.

Mater. Elkhorn or Kona Mine.

Analyses 21303 to 21307 (p. 49). Bituminous coking coal, eastern Kentucky field, from the Elkhorn or Kona mine, a drift mine at Kona (Mater post office), on the Louisville & Nashville R. R. Coal bed, Elkhorn; Carboniferous age, Pottsville group. Bed, 4½ to 5½ feet thick. The main roof is sandstone, the immediate roof is hard shale; the floor is clay. Cover at points of sampling, 150 to 200 feet. The bed was sampled by G. T. Powell on March 6, 1915, as described below:

Sections of coal bed in Elkhorn or Kona mine.

Section Analysis No.	A 21303	B 21304	C 21305	D 21306
Roof, sandstone, 20 feet.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	5	1 5	.. ..	1 0
"Mother coal"	½	½	.. ..	¾
Coal	1 7½	4½	.. ..	1 10
Shale	a 1½	a 1½	.. ..	.. ..
Coal	1 3	1 0	3 0	.. ..
Coal, hard	2	3	4	6
Coal	7	10	9	6
Coal, hard	1	4	2	2
Coal	.. ..	6	5½	5
Floor, clay.				
Thickness of bed	4 10½	4 10½	4 8½	4 5½
Thickness of coal sampled	4 10	4 9	4 8½	4 5½

a Not included in sample.

Section A (sample 21303) was cut from face of 1 left entry, 2 main entry, 450 feet from opening. Section B (sample 21304) was cut from face of 2 right entry, 1 main entry, 500 feet from opening. Section C (sample 21305) was cut from face of 1 main entry, 750 feet from opening. Section D (sample 21306) was cut from face of 2 main entry, 600 feet from opening.

The ultimate analysis of a composite sample made by combining face samples 21303, 21304, and 21306 is shown under laboratory No. 21307.

The room-and-pillar system of mining is used. In 1915 the coal was shot off the solid with FFF black blasting powder. The coal was all shipped as run-of-mine. The mine was new and was the first to be opened on the Elkhorn bed in this vicinity. The average daily output was 130 tons. Forty per cent of the coal was taken out in advance working. There was about 127 acres still to be mined from this opening.

McLEAN COUNTY.

ISLAND. O'NEIL MINE.

Analyses 19281 to 19285 (p. 49). Bituminous coal, western Kentucky field, from O'Neil mine, a shaft mine 1,000 feet north of railway station at Island, on the Owensboro and Nashville division of the Louisville & Nashville R. R. Coal bed, No. 9 of the Kentucky geological survey; Carboniferous age, Pottsville group. No rolls, horsebacks, or faults were encountered. Bed averages 4 feet 3 inches thick, and dip 2 per cent southeast; it contains a number of mother coal and "sulphur" partings. Roof, black shale; floor, hard, smooth underclay. Cover at points of sampling, 75 to 85 feet. The bed was sampled by A. F. Crider and A. W. Harris, on April 27, 1914, as described below:

Sections of coal bed in O'Neil mine.

Section	A	B	C	D
Laboratory No.	19281	19282	19283	19284
Roof, black shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal	1 1/2	5 1/2	.....	a 1/2
Coal	1 3	7 1/2	.....	1 1
"Mother coal" and "sulphur"	a 2	3/4	.....	1/2
Coal	b 8	7 1/2	.....	b 9 3/4
"Mother coal"	1/4	1/2	.....	Streak.
Coal, hard	b 1 7 3/4	2	.....	1 1/2
"Mother coal" and "sulphur"	1/2	1/2	.....	Streak.
Coal, hard	4	b 2 2	4 3 1/2	1 1/2
Floor, hard smooth clay.				
Thickness of bed	4 3	4 2 1/2	4 3 1/2	4 3/4
Thickness of coal sampled	4 1	4 2 1/2	4 3 1/2	4 1/4

a Not included in sample. b Contained streaks of "sulphur" and "mother coal."

Section A (sample 19281) was cut from face of 4 room, 3 south entry, 600 feet from shaft. Section B (sample 19282) was cut from face of main west entry, 750 feet from shaft. Section C (sample 19283) was cut from face of 6 room, 2 south entry, 400 feet southwest of shaft. Section D (sample 19284) was cut from face of 6 room, 1 south entry, 400 feet southwest of shaft.

The ultimate analysis of a composite sample made by combining equal amounts of samples 19281, 19282, 19283, and 19284 is given under laboratory No. 19285.

The mine is worked on the double-entry, room-and-pillar system, through a shaft 50 feet deep. In 1914 the coal was shot off the solid. About 85 per cent of the coal was mined in advance work. Daily output, 125 tons; maximum day's run, 250 tons.

MUHLENBERG COUNTY.

BEVIER. LAIN MINE.

Analyses 19331 to 19337 (p. 49). Bituminous coal, western Kentucky field, from Lam mine, a drift mine at Bevier, on the Louisville & Nashville R. R. Coal bed, No. 9 of the Kentucky geological survey; Carboniferous age, Pottsville group. Bed

averages about 5 feet thick; is rather free from shale and clay partings, but contains a number of "sulphur" and "mother-coal" bands. Roof, hard black shale; floor, hard smooth underclay. Cover at points of sampling, 70 to 150 feet. The bed was sampled by A. W. Harris and A. F. Crider on April 28, 1914, as described below:

Sections of coal bed in Lam mine.

Section	A	B	C	D	E	F
Laboratory No.	19331	19332	19333	19334	19335	19336
Roof, shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal	1	.. ..	.. ..	½	3½	7
"Sulphur" band	[a] ½	.. ..	.. ..	Streak.	⅛	⅛
Coal, hard	10	1 3	2 3½	1 0	1½	1 5⅜
"Sulphur"	Streak.	[a] 1	.. ..	. ..	[a] 2½	¼
Coal	10	2½	.. ..	.. ..	2	11½
"Sulphur" to "mother coal"	[b] 4	¼	¼	½	[a] ½	¼
Coal	1 9½	2 11½	3 1	3 7½	1 1⅜	2 0
"Sulphur" and "mother coal"	Streak.	[a] ¾	.. ..	½	½	½
Coal, hard	11½	6	.. ..	2¼	2 11	3
Floor, underclay.						
Thickness of bed	4 10½	5 1	5 4⅜	4 11	4 11⅜	5 4½
Thickness of coal sampled	4 10	4 11¼	5 4¼	4 11	4 8⅜	5 4½

[a] Not included in sample. [b] Coal high in "sulphur".

Section A (sample 19331) was cut from rib of 21 room, 2 west entry, 1 south entry, 4,000 feet from entrance. Section B (sample 19332) was cut from face of 3 east blind entry, 4,000 feet from entrance. Section C (sample 19333) was cut from rib of 22 room 4 east entry, 1 south entry, 4,000 feet from entrance. Section D (sample 19334) was cut from last break-through at face of 3 west entry, 1 south entry, 2 west entry, 2,500 feet from entrance. Section E (sample 19335) was cut from face of 2 south entry, 4 east entry, 3,500 feet from entrance. Section F (sample 19336) was cut from break-through, opposite 61 room, 2 east entry, 3,500 feet from entrance.

The ultimate analysis of a composite sample made by combining equal amounts of samples 19331 to 19336 is shown under laboratory No. 19337.

The mine is worked on the double-entry, room-and-pillar system. In 1914 the coal was undercut with electric chain breast machines. The cuttings were loaded out before shooting. Particles of roof and floor did not become mixed with the coal in mining. About 65 per cent of the coal was taken in advance work. Daily output, 850 tons; maximum day's run, 1,016 tons.

OHIO COUNTY.

Rockport. Crown Mine.

Analyses 19338 to 19344 (p. 49). Bituminous coal, western Kentucky field, from Crown mine, a shaft mine one-fourth mile northwest of Rockport on a spur of the Illinois Central R. R. Coal bed, No. 9 of Kentucky geological survey; Carboniferous age, Pottsville group. Bed is fairly uniform, averaging 4 feet 6 inches thick, and dips 1 per cent northwest. Roof, dark shale overlain by blue sandstone; floor, hard, smooth underclay. Cover at points of sampling 150 to 225 feet. Shaft, 120 feet deep. The bed was sampled by A. F. Crider and A. W. Harris on April 28 and 30, 1914, as described on page following.

Sections of coal bed in Crown mine.

Section	A	B	C	D	E	F
Laboratory No.	19338	19339	19340	19341	19342	19343
Roof, shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal	1 8	1 8	1 11	4½	1 3	1 3½
Coal high in "sulphur"	4	4	.. ..	6⅝	3	3
"Mother coal"	.. ..	.. ..	¼	¼	.. ..	.. ..
Coal	1 4½	1 2	2	1 2¼	8	8
"Mother coal"	Streak.	Streak.	½	½	½	¼
Coal streaked with "mother coal"	1 ½	7	.. ..	11½	10	1 1
"Sulphur" band	.. ..	Streak.	.. ..	⅛	Streak.	⅛
Coal streaked with "sulphur"	.. ..	.. ..	2 2½	7½	2	6
"Sulphur" band	.. ..	.. ..	⅛	⅛	Streak.	⅛
Coal, hard	.. ..	8½	4½	6½	1 3	10¼
Floor; underclay.						
Thickness of bed	4 5	4 5½	4 9	4 4⅝	4 5½	4 8½
Thickness of coal sampled	4 5	4 5½	4 9	4 4⅝	4 5½	4 8½

Section A (sample 19338) was cut from face of 11 room, 6 north entry, main east entry, 1,600 feet from shaft. Section B (sample 19339) was cut from face of main east blind entry, 1,800 feet from shaft. Section C (sample 19340) was cut from face of 7 south entry, 2,000 feet from shaft. Section D (sample 19341) was cut 15 feet from entry in 19 room, 5 south entry, 1,800 feet from shaft. Section E (sample 19342) was cut from neck of 46 room, 3 south entry, 2,200 feet from shaft. Section F (sample 19343) was cut from intersection of 1 east and 4 north entries, 1,200 feet from shaft.

The ultimate analysis of a composite sample made by combining equal amounts of samples 19338 to 19343, is given under laboratory No. 19344.

The mine is worked on the double-entry, room-and-pillar system. In 1914 the coal was undercut with electric chain cutting machines. The cuttings were loaded out with the coal. Daily output was 800 tons.

PERRY COUNTY.

Domino. Himyar Mine.

Analyses 21334 to 21338 (p. 50). Bituminous coal, eastern Kentucky field, from Himyar mine, a drift mine at Domino, on the Louisville & Nashville R. R. Coal bed known as Haddix, Hazard, or No. 6; Carboniferous age, Pottsville group. Bed is 65 to 84 inches thick. The bed is overlain with gray shale; above the shale is sandstone; in mining, 10 inches of coal is left up for roof. Floor is clay. Cover at points of sampling, 120 to 200 feet. The bed was sampled by G. T. Powell on February 25, 1915, as described below:

Sections of coal bed in Himyar mine.

Section	A	B	C	D
Laboratory No.	21334	21335	21336	21337
Roof, coal.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal	7	[a] 2	.. ..	.. ..
Shale and clay	1	[a] 2	[a] 1	[a] 1
Coal	13	8	2	7
Shale	.. ..	½	.. ..	.. ..
Coal, hard, bony	1½	.. ..	1	4½
Coal	5	1 2	7	1 4
Bone and "mother coal"	⅓	1	.. ..	.. ..
Coal	1 10	2 2	.. ..	.. ..
Coal, hard	.. ..	.. ..	3	.. ..
"Dirt" and bone	2	3	.. ..	3
Coal	.. ..	.. 10	1 2	1 5
Coal, dirty	.. ..	.. ..	3	.. ..
Coal	.. ..	.. ..	1 2	.. ..
Coal, hard	.. ..	.. ..	3	4
Coal	.. ..	.. ..	1 3	4
Floor, clay.				
Thickness of bed	5 3⅝	5 6½	5 3	6 8½
Thickness of coal sampled	5 3⅝	5 2½	5 2	6 7½

[a] Not included in sample.

Section A (sample 21334) was cut at face of 2 left entry, 800 feet from drift mouth. Section B (sample 21335) was cut at face of 1 right entry, 500 feet from drift mouth. Section C (sample 21336) was cut at face of 1 left entry, 2 main entry, 550 feet from drift mouth. Section D (sample 21337) was cut at face of 2 main entry, 700 feet from drift mouth.

The ultimate analysis of a composite sample made by combining face samples 21334, 21335, 21336, and 21337 is shown under laboratory No. 21338.

The coal is mined by the room-and-pillar system. In 1915 the average daily output was 450 tons.

Douglas. Douglas Mine.

Analyses 21354 to 21358 (p. 50). Bituminous coal, eastern Kentucky field, from Douglas mine, a drift mine at Douglas, on the Louisville & Nashville R. R. Coal bed, known as Fire Clay, Dean, or No. 4; Carboniferous age, Pottsville group. Bed 2½ to 4 feet thick. Roof, sandstone, 20 feet thick; floor, gray shale and flinty clay. Cover at place where samples were cut, about 120 feet. The bed was sampled by G. T. Powell, on March 8, 1915, as described below:

Sections of coal bed in Douglas mine.

Section	A	B	C	D
Laboratory No.	21354	21355	21356	21357
Roof, sandstone, 20 feet.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal	8½	10	3 3	3 3
"Mother coal" and "sulphur"	½	.. ..	.. ..	.. ..
Coal, hard	.. ..	2	.. ..	.. ..
Coal	10	10	.. ..	.. ..
Coal, hard	2	2	.. ..	.. ..
Coal	1 2	10	.. ..	.. ..
Floor, shale and clay.				
Total thickness of bed	2 11	2 10	3 3	3 3
Thickness of coal sampled	2 11	2 10	3 3	3 3

Section A (sample 21354) was cut at face of 4 room, 2 right entry, 500 feet from drift mouth. Section B (sample 21355) was cut at face of 2 right entry, 600 feet from drift mouth. Section C (sample 21356) was cut at face of 3 right entry. Section D (sample 21357) was cut at face of 1 right entry, 800 feet from drift mouth.

The ultimate analysis of a composite sample, made by combining face samples 21354, 21355, 21356, and 21357, is shown under laboratory No. 21358.

The room-and-pillar system of mining is used. The coal was undercut by machine. The average daily output of the mine was 125 tons.

Hazard. Hazard Mine.

Analyses 21364 to 21367 (p. 50). Bituminous coal, eastern Kentucky field, from Hazard mine, a drift mine one-half mile east of railroad station at Hazard, on the Louisville & Nashville R. R. Coal bed, known as Fire Clay, Dean, or No. 4; Carboniferous age, Pottsville group. Bed 2½ to 4 feet thick. Roof, sandstone, 30 feet thick; floor, flinty clay. Cover over bed where sampled, about 150 feet. This bed was sampled by G. T. Powell on February 24, 1915, as described below:

Sections of coal bed in Hazard mine.

Section	A	B	C
Laboratory No.	21364	21365	21366
Roof, sandstone.	Ft. in.	Ft. in.	Ft. in.
Coal	2 0	3 3	2 6
Hard coal	.. ..	.. ..	2
"Mother coal"	⅛	.. ..	.. ..
Coal	1 0	.. ..	6
Floor, flinty clay			
Thickness of bed	3 ⅛	3 3	3 2
Thickness of coal sampled	3 ⅛	3 3	3 2

Section A (sample 21364) was cut at face of 3 west entry, 1,800 feet southwest of drift mouth. Section B (sample 21365) was cut at face of 1 west entry, 1,200 feet southwest of drift mouth. Section C (sample 21366) was cut at face of 2 right entry, 1,800 feet from drift mouth.

The ultimate analysis of a composite sample made by combining face samples 21364, 21365, and 21366 is shown under laboratory No. 21367.

The room-and-pillar system of mining is used. In 1915 the coal was undercut by machine and shot down with black powder. The average daily output was 250 tons. The tracks had a capacity of 20 empty and 20 loaded cars.

HAZARD. HAZARD-DEAN MINE.

Analyses 21368 to 21372 (p. 50–51). Bituminous coal, eastern Kentucky field, from Hazard-Dean mine, a drift mine one-half mile southwest of Hazard, on Messer branch of the Louisville & Nashville R. R. Coal bed, known as Fire Clay, Dean, or No. 4; Carboniferous age, Pottsville group. Bed is 3 feet to 3 feet 6 inches thick, and lies flat. Roof, shaly limestone; floor, hard flinty clay. Cover, 150 to 250 feet. The bed was sampled by G. T. Powell on March 1, 1915, as described below:

Sections of coal bed in Hazard-Dean mine.

Section	A	B	C	D
Laboratory No.	21368	21369	21370	21371
Roof, sandstone.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	2 2	1 10	1 1½	2 9
"Mother coal," bone, and hard coal	1	1	½	1
Coal	1 1	1 4	1 6	6
Hard coal	.. ..	.. ..	1	.. ..
Coal	.. ..	.. ..	7	.. ..
Flinty clay	.. ..	.. ..	[a] 6	[a] 6
Coal	.. ..	.. ..	[a] 7	[a] 7
Floor, flinty clay.				
Thickness of bed	3 4	3 5	4 5	4 5
Thickness of coal sampled	3 4	3 5	3 4	3 4

[a] Not included in sample.

Section A (sample 21368) was cut at face of 1 main entry, 900 feet from drift mouth. Section B (sample 21369) was cut at face of 2 main entry, 500 feet from drift mouth. Section C (sample 21370) was cut at face of 2 right entry, 900 feet from drift mouth. Section D (sample 21371) was cut at face of 2 left entry, 950 feet from drift mouth.

The ultimate analysis of a composite sample made by combining face samples 21368, 21369, 21370, and 21371 is shown under laboratory No. 21372.

The room-and-pillar system of mining is used. In 1915 the coal was undercut by machine and shot down with FF black blasting powder. About one-third of the coal was screened. The output was about 225 tons per day. There was about 150 acres still to be mined.

HAZARD. ROSS-PETREY MINE.

Analysis 21686 (p. 51). Bituminous coal, eastern Kentucky field, from Ross-Petrey mine, about 1 mile south of Hazard, on the Louisville & Nashville R. R. Coal bed, known as Fire Clay, Dean, or No. 4; Carboniferous age, Pottsville group. Roof, sandstone; floor, hard, flinty clay. Cover at point of sampling, 175 feet. The bed was sampled by G. T. Powell on March 1, 1915, as described below:

Section of coal bed in Ross-Petrey mine.

Roof, sandstone.	*Ft. In.*
Coal	2 5
Bone	3
Coal	5
Bone ("Jack rock")	[a] 3
Coal	?
Floor, hard, flinty clay.	
Thickness of bed	3 6
Thickness of coal sampled	3 3

[a] Not included in sample

The sample was cut at face of 2 drift entry, main entry, 500 feet from drift mouth. The mine was a small one and shipped only a few tons per day.

Lennut. North Fork Mine.

Analyses 21359 to 21363 (p. 51). Bituminous coal, eastern Kentucky field, from North Fork mine, a drift mine at Lennut, on the Louisville & Nashville R. R. Coal bed, known as Fire Clay, Dean, or No. 4; Carboniferous age, Pottsville group. Bed, 3 to 4 feet thick. Roof, thin shale, overlain by sandstone; floor, flinty clay. The bed was sampled by G. T. Powell on February 25, 1915, as described below:

Sections of coal bed in North Fork mine.

Section	A	A	C	D
Laboratory No.	21359	21360	21361	21362
Roof, shale (4½ to 7 inches).	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	[a] 1	[a] 1	10	[a] 1
Shale	[a] 5	[a] 5	.. ..	[a] 7
Coal	3 0	3 0	.. ..	10
Coal, hard	.. ..	.. ..	3½	3
Coal	.. ..	.. ..	1 11	1 10
Floor, flinty clay.				
Thickness of bed	3 6	3 6	3 ½	3 7
Thickness of coal sampled	3 0	3 0	3 ½	2 11

[a] Not included in sample.

Section A (sample 21359) was cut at face of 1 left entry, 700 feet from drift mouth. Section B (sample 21360) was cut at face of main entry, 900 feet from drift mouth. Section C (sample 21361) was cut at face of 15 room, left entry, 2 main entry, 700 feet from drift mouth. Section D (sample 21362) was cut at face of 18 room, 2 left entry, 750 feet from opening.

The ultimate analysis of a composite sample made by combining face samples 21359, 21360, 21361, and 21362 is shown under laboratory No. 21363.

The room-and-pillar system of mining is used. In 1915 the average daily output was 275 tons.

Lothair. Ashless Mine.

Analyses 21349 to 21353 (p. 51). Bituminous coal, Eastern Kentucky field, from Ashless mine, a drift mine one-half mile southeast of Lothair, on the Louisville & Nashville R. R. Coal bed, known as Fire Clay, Dean, or No. 4; Carboniferous age, Pottsville group. Bed 3½ to 4½ feet thick. Roof, sandstone; floor, flinty clay. Cover at points sampled, 100 to 170 feet. The bed was sampled by G. T. Powell on March 8, 1915, as described below:

Sections of coal bed in Ashless mine.

Section	A	B	C	D
Laboratory No.	21349	21350	21351	21352
Roof, sandstone.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	1 2	10	1 1	1 2
"Sulphur" streak	.. ..	½	.. ..	.. ..
Coal, hard	.. ..	.. ..	1	1
Coal	.. ..	5	2 2	2
"Mother coal"	½	½	.. ..	½
Coal	2 8	2 2	.. ..	11
Coal, hard	4	4	1	4
Coal	4	2	7	9
Coal, hard	.. ..	.. ..	.. ..	1
Coal	.. ..	.. ..	.. ..	9
Floor, flinty clay.				
Thickness of bed	4 6½	4 0	4 0	4 3½
Thickness of coal sampled	4 6½	4 0	4 0	4 3½

Section A (sample 21349) was cut at face of 1 main entry, 700 feet from drift mouth. Section B (sample 21350) was cut at face of 2 main entry. Section C (sample 21351) was cut at face of 2 left entry, 500 feet from drift mouth. Section D (sample 21352) was cut at face of 2 right entry, 550 feet from drift mouth.

The ultimate analysis of a composite sample made by combining face samples 21349, 21350, 21351, and 21352 is shown under laboratory No. 21353.

The room-and-pillar system of mining is used. In 1915 the average daily output was 350 tons.

LOTHAIR. KENTUCKY JEWEL MINE.

Analyses 21344 to 21348 (p. 51). Bituminous coal, eastern Kentucky field, from Kentucky Jewel mine, a drift mine 1 mile north of Lothair, on the Louisville & Nashville R. R. Coal bed, known as Flag or No. 7; Carboniferous age, Pottsville group. Bed is 3 to 5 feet thick. Roof, sandstone, 30 feet thick; floor, clay. Cover at points of sampling, 80 to 210 feet. The bed was sampled by G. T. Powell on March 8, 1915, as described below:

Sections of coal bed in Kentucky Jewel mine.

Section	A		B		C		D	
Laboratory No.	21344		21345		21346		21347	
Roof, sandstone.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Coal		7	1	1		9	1	0
Bone	..	..	..	..		4		2
Coal, hard		1		2½	..	..	..	..
Coal		10	1	9		9	1	8
Coal, hard	..	..		4	..	..	..	..
"Mother coal" and bone		½	..	..		1		3
Coal	1	0		4	1	1		1
Coal, hard		5		4½	..	..	..	..
Bone	..	..	..	..		3		1
Coal		7		2	1	2		6
Coal, hard		2	..	..	..	..		..
Bone	..	..	..	..	..	..	..	3
Coal		6	..	..	..	..		2
Bone	..	..	..	..	..	..		2
Floor, clay.								
Thickness of bed	4	2½	4	3	4	5	4	4
Thickness of coal sampled	4	2½	4	3	4	5	4	4

Section A (sample 21344) was cut at face of 3 main entry, 600 feet from mine opening. Section B (sample 21345) was cut at face of 4 main entry, 500 feet from mine opening. Section C (sample 21346) was cut at face of 1 entry, 1,400 feet from mine opening. Section D (sample 21347) was cut at face of 5 entry, 400 feet from mine opening.

The ultimate analysis of a composite sample made by combining face samples 21344, 21345, 21346 and 21347 is shown under laboratory No. 21348.

The room-and-pillar system of mining is used. The average daily output was 350 tons.

PIKE COUNTY.

SPRIGG (W. VA.). BURNWELL NO. 2 MINE

Analysis 17459 (p. 51). Bituminous coal, Russell Fork field, from Burnwell No. 2 mine, a drift mine on Kentucky side of Tug Fork River, opposite Sprigg, W. Va., on main line of Norfolk & Western Ry., one-half mile south of Sprigg and 2½ miles west of Matewan, W. Va. Coal bed, known as Rawl, No. 2, or Gas; Carboniferous age, Pennsylvanian series. Bed is fairly uniform, averaging 5 feet thick, and lies nearly horizontal. Roof, shale; floor, shale. The bed was sampled by Eugene Stebinger, June 3, 1913, as described on page following.

Section of coal bed in Burnwell No. 2 mine.

	Ft.	in.
Roof, shale.		
Bright coal, well jointed		5
Bone with a few streaks of shiny coal		[a] 7
Bright coal with well-developed joints	1	2
Clay parting		[a] 2
Bright coal with well-developed joints	2	0
Hard, dull splint coal		9
Floor, shale.		
Thickness of bed	5	1
Thickness of coal sampled	4	4

[a] Not included in sample.

Sample was taken from 9 room, 4 left entry, main entry, 2,000 feet from mine mouth.

In 1913 the average daily output was about 500 tons.

THACKER (W. VA.). LITTLE THACKER MINE.

Analyses 17460 and 17461 (p. 51). Bituminous coal, Russell Fork field, from Little Thacker mine, a drift mine on the Kentucky side of Tug Fork River, 1½ miles southwest of Thacker, W. Va., on main line of Norfolk & Western Ry. Coal beds, locally known as the Alum and Thacker; Carboniferous age, Pennsylvanian series. The Alum bed lies 200 feet below the Thacker bed and is about 4½ feet thick. It has a shale roof which spalls badly, often coming down with the coal, and a shale floor. The Thacker bed is about 5 feet thick and has a shale roof and floor. The beds are nearly horizontal. They were sampled by Eugene Stebinger, June 5, 1913, as described below:

Section of Alum coal bed at Little Thacker mine.

Laboratory No.	17460
	Ft. in.
Roof, shale, spalls badly.	
Coal, dull, rather bony	1½
Coal, hard, lustrous	11
Coal, rather dull, hard, splint-like	1 6
Gray clay parting	[a] 4
Coal, dull, hard, splint, with hackly fracture	1 8
Floor, shale.	
Thickness of bed	4 6½
Thickness of coal sampled	4 2½

[a] Not included in sample.

Sample 17460 was measured at 1 right entry, main air course, 700 feet from outcrop; cover, 250 feet.

Section of Thacker coal bed in Little Thacker mine.

Laboratory No.	17461
	Ft. in.
Roof, shale.	
Coal, lustrous and rather soft, with well-developed joints	1 4
Coal, dull hard splint, with a few lustrous streaks	1 4
Coal, hard iron-gray splint	7
Coal, lustrous and rather soft, with streaks of hard, dull splint	1 10
Floor, shale.	
Total thickness of bed	5 1

Sample 17461 was taken from last right entry, 2 drift, 3,000 feet in; cover, 80 feet.

Power house and bunkers of this mine are on the West Virginia side of the river and are connected with the mine by an aerial tram. In 1913 the average daily capacity was 400 tons.

UNION COUNTY.

DEKOVEN. BANKS MINE.

Analysis 23011 (p. 51). Bituminous coal, western Kentucky field, from Banks mine, one-half mile southeast of Dekoven. Coal bed, No. 10; Carboniferous age, Pennsylvanian series, Pottsville group. The bed was sampled October 5, 1915, by Wallace Lee, as shown below:

Section of coal bed in Banks mine.

	Ft.	in.
Roof, gray shale.		
Coal, bony		[a] ½
Coal	2	2
Pyrite streak		⅛
Coal		6
Floor, hard clay.		
Thickness of bed	2	8⅝
Thickness of coal sampled	2	8⅛

[a] Not included in sample.

The sample was taken in 2 east entry, 200 feet northeast of mine opening.

DEKOVEN. CURLEW MINE.

Analysis 23010 (p. 51). Bituminous coal, western Kentucky field, from Curlew mine, 2 miles north of Dekoven, on Illinois Central R. R. Coal bed, No. 9 of Kentucky geological survey; Carboniferous age, Pennsylvanian series, Pottsville group. Roof, black shale; floor, hard clay. The bed was sampled October 4, 1915, by Wallace Lee. The sample was taken in slope, 2,000 feet from mouth of mine, and represented 4 feet 8 inches of coal.

DEKOVEN. OHIO VALLEY MINE.

Analyses 19169 to 19175 (p. 52). Bituminous coal, western Kentucky field, from Ohio Valley mine, a slope mine three-fourths mile northeast of Dekoven, with shipping connection on the Ohio River and the Illinois Central R. R. Coal bed, No. 9 of Kentucky geological survey; Carboniferous age, Pottsville group. Dip, 8 per cent north of east. Two large faults had been encountered. Bed is 4 feet 7 inches thick and contains a number of "mother coal" and "sulphur" partings. Roof is hard black shale, which contains occasional horsebacks and numerous "niggerheads"; floor is hard, smooth underclay. Cover at points of sampling, 125 to 375 feet. The bed was sampled by A. F. Crider and A. W. Harris, on April 2, 1914, as described below:

Sections of coal bed in Ohio Valley mine.

Section	A		B		C		D		E		F	
Laboratory No.	19169		19170		19171		19172		19173		19174	
	Ft.	in.	Ft.	in.	Ft.	in.	Ft.	in.	Ft.	in.	Ft.	in.
Roof, black shale.												
Coal	..	..		8¾		6½		7½		10		7½
"Mother coal"	..	..	..	..	..	..		¼	..	..		½
Coal	2	7	..	..	..	..	1	3	..	..		6
Coal with "mother coal" and "sulphur" partings	..	..	1	3½		5¾		¼	Streak.		1	2
Coal	..	..	..	..	..	..		1¾	1	9½		10½
"Mother coal"	..	..		½		¼		¼		½		½
Coal	..	..	[a] 1	3¾	[a] 1	8½	1	2	1	1½		5
"Sulphur"		[b] 5		¼		¼	Streak.		Streak.		Streak.	
Coal		2	..	..		[a] 11		6		3½		3
"Sulphur"		½	..	..		¼		¾	Streak.		[b]	¼
Coal	1	1½	[a] 1	1		[a] 9		10		[a] 8		5½
Floor, hard smooth underclay.												
Thickness of bed	4	4	4	5½	4	5½	4	7¾	4	9	4	5½
Thickness of coal sampled	3	11	4	5¼	4	5½	4	7¾	4	9	4	4½

[a] Contains streaks of "mother coal" and "sulphur." [b] Not included in sample.

Section A (sample 19169) was cut from face of 6 west entry, 1¼ miles from entrance. Section B (sample 19170) was cut from face of 7 west entry, 1¼ miles from entrance. Section C (sample 19171) was cut from face of 6 east level, 8,400 feet from entrance. Section D (sample 19172) was cut from face of 7 east level, 3,900 feet from foot of slope. Section E (sample 19173) was cut from face of 8 room, 12 rise, 6 east entry, 8,000 feet from foot of slope. Section F (sample 19174) was cut from rib of 5 rise, 7 west entry, 1¼ miles from entrance.

The ultimate analysis of a composite sample made by combining equal amounts of samples 19169 to 19174, inclusive, is given under laboratory No. 19175.

The bed is worked on the double-entry panel system. In 1914 the coal was undercut with electric coal-cutting short-wall and air-punching machines. Machine cuttings were loaded out before shooting. Particles of roof and floor did not become mixed with the coal in loading. The daily output was 850 tons, and the maximum day's run was 1,140 tons. There were a number of beehive coke ovens accessible to the mine.

Dekoven. Syres Mine.

Analysis 23012 (p. 52). Bituminous coal, western Kentucky field, from Syres mine, one mile north of Dekoven. Coal bed, No. 10; Carboniferous age, Pennsylvanian series, Pottsville group. Roof, gray shale; floor, hard clay. The bed was sampled on October 4, 1915, by Wallace Lee. The sample was taken at 3 north entry, main entry, 550 feet northwest of mine opening, and represented 2 feet 10 inches of coal.

Morganfield. Morganfield Mine.

Analyses 19055 to 19059 (p. 52). Bituminous coal, western Kentucky field, from Morganfield mine, a shaft mine one-half mile north of Morganfield, on Illinois Central R. R. Coal bed, No. 11 of Kentucky geological survey; Carboniferous age, Pottsville formation. Bed averages 4 feet 5 inches thick. The coal contains a thick shale parting termed "blue band" about 9 inches from the bottom and a number of partings of mother coal and sulphur. Roof, limestone containing many horsebacks; floor, soft shaly underclay. Cover at points of sampling, about 225 feet. Bed was sampled by A. W. Harris and A. F. Crider on March 30, 1914, as described below:

Sections of coal bed in Morganfield mine.

Section Laboratory No.	A 19055	B 19056	C 19057	D 19058
	Ft. in.	*Ft. in.*	*Ft. in.*	*Ft. in.*
Roof, limestone.				
Coal	[b] 1 1¾	1 0	[b] 1 3¾	1 0
"Mother coal" high in "sulphur"	[a] ½	Streak.	[a] ½	[a] 1
Coal streaked with "sulphur"	2 1¾	2 3	2 0	2 0
"Sulphur"	½	Streak.	.. ..	Streak.
Coal	3¼	3	.. ..	3½
"Blue band"	[a] 2½	[a] 2	[a] 2½	[a] 2
Coal streaked with "sulphur"	8¼	9	6	8
Coal high in "sulphur"	.. ..	.. ..	[a] 4½	[a] 1
Floor, soft underclay.				
Thickness of bed	4 6½	4 5	4 5	4 3½
Thickness of coal sampled	4 3½	4 3	3 9¾	3 11½

[a] Not included in sample. [b] Contained small "sulphur" streaks.

Section A (sample 19055) was cut from face of 5 north entry, 2,400 feet from shaft. Section B (sample 19056) was cut from face of 16 room, 3 south entry, 1,500 feet from shaft. Section C (sample 19057) was cut from face of 30 room, 1 south entry, west main entry, 1,700 feet from shaft. Section D (sample 19058) was cut from face of 28 room, 2 south entry, 1,800 feet from shaft.

The ultimate analysis of a composite sample made by combining equal amounts of samples 19055 to 19058 is given under laboratory No. 19059.

The mine is worked on the double-entry, room-and-pillar system, through a shaft 225 feet deep. In 1914 the coal was shot off the solid. Pillars had not been pulled. Fifty per cent of the coal was taken in advance work. Average daily output was 75 tons; maximum day's run was 150 tons.

Spring Grove. Buchanan Mine.

Analysis 23013 (p. 52). Bituminous coal, western Kentucky field, from Buchanan mine, 1 mile northeast of Spring Grove. Coal bed, No. 11 of Kentucky geological survey; Carboniferous age, Pennsylvanian series, Pottsville group. The bed was sampled on October 6, 1915, by Wallace Lee, as shown below:

Section of coal bed in Buchanan mine.

	Ft.	in.
Roof, black shale.		
Cannel coal		8
"Sulphur" lens		[a] ½
Cannel coal		9
"Sulphur" streak		⅛
Cannel coal		5
"Mother coal"		⅜
Cannel coal		9
Coal with thin streaks of "sulphur"		1½
Coal		3
"Blue band"		[a] 2¼
Coal		7
Floor, hard clay.		
Thickness of bed	3	9¾
Thickness of coal sampled	3	7

[a] Not included in sample.

The sample was taken 300 feet southwest of shaft.

Sturgis. Crittenden Mine.

Analyses 19113 to 19116, and 19356 (pp. 52–53). Bituminous coal, western Kentucky field, from Crittenden mine, a slope mine 3½ miles northwest of Sturgis on the Illinois Central R. R. Coal bed, No. 6 of Kentucky geological survey; Carboniferous age, Pottsville group. Bed is fairly uniform; averages 3 feet 8 inches thick. Coal is fairly free from shale partings, the only impurities being numerous "sulphur" bands. Roof, hard gray shale; floor, soft shaly underclay. Cover at points of sampling, 40 to 50 feet. The coal bed was sampled by A. W. Harris and A. F. Crider on April 7, 1914, as described below:

Sections of coal bed in Crittenden mine.

Section	A	B	C	D
Laboratory No.	19113	19114	19115	19116
Roof, hard gray shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal	5	5	[a] 1 11½	[a] 1 3
"Sulphur" band	Streak.	Streak.	[b] ½	[b] ½
Coal	7½	1 6½	[b] 3	.. ..
"Sulphur" band	.. ..	[b] 2½	[b] ½	.. ..
Coal high in "sulphur"	5½	.. ..	7½	2 6
Coal	2 1½	1 6½	11	.. ..
Floor, soft underclay.				
Thickness of bed	3 7½	3 8½	3 10	3 9½
Thickness of coal sampled	3 7½	3 6	3 6	3 9

[a] Not included in sample. [b] Coal streaked with sulphur.

Section A (sample 19113) was cut from the rib of the 1 west entry, main north entry, 800 feet from mine opening. Section B (sample 19114) was cut from face of 22 room, 2 east entry, main north entry, 1,000 feet from mine opening. Section C (sample

19115) was cut from face of 18 room, 2 east entry, main north entry, 2,200 feet from mine opening. Section D (sample 19116) was cut from the face of 20 room, 2 east entry, main north entry, 2,200 feet from opening.

The ultimate analysis of a composite sample made by combining equal amounts of samples 19114, 19115, and 19116 is given under laboratory No. 19356.

Mine was not being operated at time of sampling.

Sturgis. No. 8 Mine.

Analyses 19071 to 19076 (p. 53). Bituminous coal, western Kentucky field, from No. 8 mine, a slope mine 2 miles northwest of Sturgis on Illinois Central R. R. Coal bed, No. 9 of Kentucky geological survey; Carboniferous age, Pottsville group. Bed is 4½ to 5½ feet thick. Coal is usually free from clay and shale partings, but contains a number of "sulphur" and mother coal bands. Roof, black shale, with "draw slate" in places; floor, hard smooth underclay. Cover at points of sampling, 50 to 150 feet. The bed was sampled by A. F. Crider and A. W. Harris on April 1, 1914, as described below:

Section of coal bed in No. 8 mine.

Section	A	B	C	D	E
Laboratory No.	19071	19072	19073	19074	19075
Roof, black shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal, brittle, glossy	8	8	11	10	2½
"Sulphur band"	[a] 1½	¼	Streak.	¼	¼
Coal	2 3½	2 10½	1 1¼	3½	4½
"Mother coal"	.. ..	.. ..	¼	¼	¼
Coal	.. ..	.. ..	7	5¾	.. ..
"Mother coal"	.. ..	.. ..	½	¼	.. ..
Coal streaked with "mother coal" and "sulphur"	.. ..	5	9	9¾	1 ½
"Mother coal"	½	Streak.	¼	¼	¼
Coal	1 3	1 1	11	[b] 1 2½	.. ..
Sulphur	Streak.	.. ..	½	¼	.. ..
Coal streaked with "sulphur"	10½	.. ..	1 2	1 1¾	3 0
Floor, hard, smooth clay.					
Thickness of bed	5 3	5 ¾	5 6¾	4 10¾	4 8¼
Thickness of coal sampled	5 1½	5 ¾	5 6¾	4 10¾	4 8¼

[a] Not included in sample. [b] Coal contained streaks of "mother coal" or "sulphur."

Section A (sample 19071) was cut from the rib of 3 west entry, 850 feet from slope mouth. Section B (sample 19072) was cut from the face of 4 west air course, 1,800 feet from slope mouth. Section C (sample 19073) was cut from rib of main slope entry, 2,000 feet from slope mouth. Section D (sample 19074) was cut from face of 4 east level, 2,098 feet from slope mouth. Section E (sample 19075) was cut from face of 3 east level, 2,000 feet from slope mouth.

The ultimate analysis of a composite sample made by combining equal amounts of samples 19071 to 19075 is given under laboratory No. 19076.

The bed is worked by the double-entry, room-and-pillar system. In 1914 the coal was undercut by longwall machines, and broken down with black powder. Dynamite was used for brushing floor and roof. Cuttings were sometimes loaded before shooting coal. Particles of roof and floor did not become mixed with coal in mining. Tipple was equipped with shaking screens, 48 square feet of which contained holes 2¼ inches in diameter, and 74 square feet, 1¼-inch holes. Two pickers were employed on cars. Screenings were neither washed nor coked. There were three loading tracks. Seventy per cent of the coal was taken in advance work. Daily output was 400 to 700 tons. Maximum daily run, 700 tons.

Sturgis. No. 9 Mine.

Analyses 19081 to 19085 (p. 53). Bituminous coal, western Kentucky field, from No. 9 mine, a shaft mine 1½ miles northeast of Sturgis, on Illinois Central R. R. Coal bed, No. 9, of Kentucky geological survey; Carboniferous age, Pottsville group. Dip, 4 per cent N. 17° E. Bed is 4 feet 8 inches to 5 feet 2 inches thick, and contains a

number of "sulphur" bands and "niggerheads" but no rolls or horsebacks. Roof, hard black shale; floor, hard underclay. Cover at points of sampling, about 400 feet. The bed was sampled by A. F. Crider and A. W. Harris on April 3, 1914, as described below:

Sections of coal bed in No. 9 mine.

Section Laboratory No	A 19081	B 19082	C 19083	D 19084
Roof, black shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	6	a 8	a 1 2	.. ..
Coal streaked with "sulphur"	½	½	1½	b 3
Coal	10	6	a 1 1	.. ..
Coal streaked with "sulphur"	1½	1	b 1½	11
Coal	1 4	5	.. ..	.. ..
Coal streaked with "sulphur"	4	1	6¼	b 1
Coal	7	5½	.. ..	1 1½
"Mother coal" and "sulphur ball"	b 1	½	b 1	b 4
Coal	10½	1 0	.. ..	.. ..
Coal streaked with "sulphur"	.. ..	1 9½	1 9	2 2
Floor, hard, smooth underclay.				
Thickness of bed	4 8¾	5 ¾	4 10	4 10½
Thickness of coal sampled	4 7¾	5 ¼	4 7¾	4 2½

a Coal streaked with "sulphur." b Not included in sample.

Section A (sample 19081) was cut from face of east entry, 135 feet from shaft. Section B (sample 19082) was cut from face of main west entry, 400 feet from shaft. Section C (sample 19083) was cut from face of main east entry, 450 feet from shaft. Section D (sample 19084) was cut 75 feet northwest of the shaft.

The ultimate analysis of a composite sample made by combining equal amounts of samples 19081 to 19084 is given under laboratory No. 19085.

The bed is worked through a shaft 450 feet deep, on the double-entry, panel system. In 1914 the coal was undercut with electric longwall coal-cutting machines. Machine cuttings were loaded out before shooting. Particles of floor and roof did not become mixed with the coal in loading. Daily production, 100 tons.

Uniontown. River Mine.

Analyses 18993 to 18998 (p. 53). Bituminous coal, western Kentucky field, from River mine, a shaft mine 1½ miles from Uniontown on the Illinois Central R. R. Coal bed, No. 11 of the Kentucky geological survey; Carboniferous age, Pottsville group. Bed averages 4 feet 6 inches thick. No faults, rolls, or horsebacks had been encountered. Roof, limestone; floor, soft fireclay, Cover at points of sampling, 195 feet. The bed was sampled by A. W. Harris and A. F. Crider on March 28, 1914, as described below:

Sections of coal bed in River mine.

Section Laboratory No	A 18993	B 18994	C 18995	D 18996	E 18997
Roof, limestone.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal, clean	10½	a 1½	11½	11	11
"Sulphur" band	a 1	Streak.	a ¾	a ¾	a ¾
Coal, clean	3½	b 5	1 . 0	b 11½	11
Coal to "sulphur"	½	a 1	Streak.	½	a ¾
Coal	b 1 5	b 2 6¾	7	1 5	1 2
"Sulphur"	¼	.. ..	Streak.	.. ..	½
Coal streaked with "sulphur"	9	.. ..	10	.. ..	5
"Blue band"	a 1½	a 1	a 2½	a 1½	a 3
Coal	.. ..	a 1¾	.. ..	a 1	.. ..
"Sulphur" band, hard	.. ..	a ½	.. ..	a ½	.. ..
Coal, "mother coal," and "sulphur"	1 0	9¼	10½	11	1 0
Floor, soft underclay.					
Thickness of bed	4 6¾	4 2¾	4 6	4 6¾	4 10
Thickness of coal sampled	4 4¼	3 9	4 2¾	4 3¾	4 5½

a Not included in sample. b Contained streaks of "mother coal" and "sulphur,"

Section A (sample 18993) was cut from face of main east entry, 1,400 feet from shaft. Section B (sample 18994) was cut from face of main west entry, 1,330 feet from shaft. Section C (sample 18995) was cut from face of 24 room, 1 south entry, east side, 1,285 feet from shaft. Section D (sample 18996) was cut from face of 1 south entry, main west entry, 30 feet inby 22 room. Section E (sample 18997) was cut from face of 3 south entry, 1,290 feet from shaft.

The ultimate analysis of a composite sample made by combining equal amounts of samples 18993 to 18997, inclusive, is given under laboratory No. 18998.

The bed is worked on the pillar-and-stall, double-entry system. In 1914 the coal was undercut with electric cutting machines and broken down with black blasting powder. Particles of roof sometimes mixed with the coal in loading. The tipple had bar screens 12 feet long with 1½-inch and ⅞-inch openings. Sixty-two per cent of the coal passed through the screens. Pickers were employed on cars. There were four loading tracks with a capacity of 28 empty and 28 loaded cars. Daily output of mine was 300 tons, none of which was shipped as run-of-mine. Maximum daily run, 300 tons, which was to be increased to 1,000 tons.

WEBSTER COUNTY.

CLAY. NO. 7 MINE.

Analyses 19148 to 19154 (p. 53). Bituminous coal, western Kentucky field, from No. 7 mine, a shaft mine 1¼ miles northwest of Clay on Illinois Central R. R. Coal bed, No. 12 of Kentucky geological survey; Carboniferous age, Pottsville group. Main roof was gray shale; 6 to 18 inches of coal were left up in mining. Floor, hard underclay. Cover at points of sampling, about 235 feet. The bed was sampled by A. F. Crider and A. W. Harris on April 9, 1914, as described below:

Sections of coal bed in No. 7 mine.

Section	A	B	C	D	E	F
Laboratory No.	19148	19149	19150	19151	19152	19153
Roof, gray shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Top coal	[a] 1 6	[a] 1 6	[a] 1 0	[a] 1 0	[a] 6	[a] 1 0
Coal, bright and brittle	2 10	5 6	.. ..	1 4½	7½	1 ½
"Mother coal"	½	.. ..	.. ..	½	[a] ¼	¼
Coal, clean	2 7½	.. ..	.. ..	9	2 11½	.. ..
"Sulphur" band	.. ..	.. ..	.. ..	¼	2	.. ..
Coal with streaks of "mother coal" and "sulphur"	.. ..	.. ..	6 2	3 ½	1 9½	4 10
Bottom coal	.. ..	.. ..	.. ..	[a] 6	[a] 1 6	[a] 6
Floor, hard, shaly underclay.						
Thickness of bed	7 0	7 0	7 2	6 8½	7 6¾	7 4¾
Thickness of coal sampled	5 6	5 6	6 2	5 2½	5 6½	5 10¾

[a] Not included in sample.

Section A (sample 19148) was cut from face of west dip entry air course, 1,850 feet from shaft. Section B (sample 19149) was cut from neck of break-through between 3 and 4 south entries, 2 right entry, 1,600 feet from shaft. Section C (sample 19150) was cut from face of 4 south entry, 2 left entry, 2,800 feet from shaft. Section D (sample 19151) was cut from face of 10 room, 1 left entry, west dip entry, 2,000 feet from shaft. Section E (sample 19152) was cut from face of 14 room, 1 south entry, 2 right entry, 1,600 feet from shaft. Section F (sample 19153) was cut in east break-through at face of 2 left entry, 3,000 feet from main shaft.

The ultimate analysis of a composite sample made by combining equal amounts of samples 19148 to 19153 is given under laboratory No. 19154.

The mine is worked on the room-and-pillar system. In 1914 the daily output was about 1,000 tons.

PROVIDENCE. NO. 3 MINE.

Analyses 19141 to 19147 (p. 54). Bituminous coal, western Kentucky field, from No. 3 mine, a shaft mine two-thirds of a mile north of center of Providence on the Illinois Central R. R. and the Louisville & Nashville R. R. Coal bed, No. 9 of the Kentucky geological survey; Carboniferous age, Pottsville group. Dip 2½ per cent, N. 65° E.; cleat N. 65° W. Numerous small faults had been encountered. Bed has an average thickness of 4 feet 8 inches and contains a number of "sulphur" partings. Roof, hard black shale; floor, hard smooth underclay. Cover at points of sampling, 150 to 75 feet. Bed was sampled by A. F. Crider and A. W. Harris on March 10, 1914, as described below:

Sections of coal bed in No. 3 mine.

Section	A	B	C	D	E	F
Laboratory No.	19141	19142	19143	19144	19145	19146
Roof, hard black shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal, hard and brittle	3½	4½	1 0	3½	1 0	6½
"Sulphur" partings	⅛	Streak.	Streak.	Streak.	.. ..	a ½
Coal, and thin "sulphur" partings	1 3	1 3	9½	3 4½	2	7½
"Sulphur" or "mother coal"	¾	1	½	.. ..	.. ..	¼
Coal, hard and bright	b 3 3	1 11½	4	.. ..	b 2 11½	3 6½
"Sulphur" or "mother coal"	.. ..	a 1	½	¼	¼	.. ..
Coal	.. ..	b 1 ½	2 6	b 1 0	6	.. ..
Floor, hard smooth underclay.						
Thickness of bed	4 10⅜	4 9½	4 8½	4 8	4 7¾	4 9
Thickness of coal sampled	4 10⅜	4 8½	4 8½	4 8	4 7¾	4 8¾

a Not included in sample. b Contained "sulphur" or "mother-coal" partings.

Section A (sample 19141) was cut from 8 room, 2 east entry, main north entry, 1,300 feet from shaft. Section B (sample 19142) was cut from face of 8 room, 2 west entry, main north entry, 1,200 feet from shaft. Section C (sample 19143) was cut from face of 14 room, 2 west entry, main north entry, 1,450 feet from shaft. Section D (sample 19144) was cut from face of 6 room, 3 west entry, main north entry, 1,500 feet from shaft. Section E (sample 19145) was cut from last break-through in 19 room, 1 west entry, main north entry, 1,500 feet from shaft. Section F (sample 19146) was cut from face of main north entry, 1,500 feet from shaft.

The ultimate analysis of a composite sample made by combining equal amounts of samples 19141 to 19146, inclusive. is given under laboratory No. 19147.

The bed is worked on the double-entry, room-and-pillar system, through a shaft 105 feet deep. In 1914 the coal was undercut with electric coal-cutting machines and broken down with black blasting powder. Particles of floor and roof did not become mixed with coal in loading. About two-thirds of the coal was taken in advance work. In 1914 the daily output was 650 tons; maximum day's run was 900 tons.

PROVIDENCE. SHAMROCK MINE.

Analyses 19176 to 19185 (p. 54). Bituminous coal, western Kentucky field, from Shamrock mine, a shaft mine 1½ miles northeast of Providence, on the Louisville & Nashville R. R. Coal bed, No. 11 of the Kentucky geological survey; Carboniferous age, Pottsville group. Bed has an average thickness of 5 feet 10 inches and contains a number of "sulphur" and "mother-coal" bands, also a characteristic shale parting 1½ to 3½ inches thick, locally termed "blue band," about 2 feet from the floor. Roof, black shale and limestone; floor, hard underclay. Cover at points of sampling, 70 to 150 feet. The bed was sampled by A. F. Crider and A. W. Harris on April 13 and 14, 1914, as described on page following.

Sections of coal bed in Shamrock mine.

Section	A	B	C	D
Laboratory No.	19176	19177	19178	19179
Roof, limestone.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal adhering to roof	a 5	a 2	.. ..	.. ..
Coal	10	1 0	1 2	10½
"Sulphur" parting	¼	a ¾	½	a ¾
Coal	b 2 5	5½	2 3½	1 1½
"Sulphur"	Streak.	Streak.	Streak.	¾
Coal	3	1 10	3	9½
"Sulphur" lens	.. ..	¼	.. ..	a ¼
Coal	.. ..	4½	.. ..	b 8
"Blue band"	a 2	a 2	a 1½	a 1½
Coal	b 10	2½	2½	10½
"Sulphur" parting	¼	Streak.	Streak.	¼
Coal	b 1 ½	b 1 8	1 9½	1 2
Floor, hard underclay.				
Thickness of bed	6 0	5 11½	5 10¼	5 10
Thickness of coal sampled	5 5	5 6¾	5 8¾	5 7

Section	E	F	G	H	I
Laboratory No.	19180	19181	19182	19183	19184
Roof, black shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal adhering to roof	.. ..	.. ..	.. ..	.. ..	a 2
Coal, hard and brittle	1 1	1 3	1 ½	1 2	b 1 0
"Sulphur" parting	a ¾	a ¾	a ½	¼	a ½
Coal	1 9	1 11½	b 2 4	10¾	b 2 ¾
"Mother coal" and "sulphur"	1	¼	a ½	½	a ½
Coal	10	8	3	b 1 7½	b 8½
"Blue Band"	a 1½	a 3½	a 1¾	a 1½	a 1¾
Coal	2½	2	.. ..	b 10½	.. ..
"Sulphur" parting	Streak.	Streak.	.. ..	¼	.. ..
Coal	b 1 9½	1 9	b 2 0	1 1	b 2 1
Floor, hard underclay.					
Thickness of bed	5 11¼	6 2	5 10¼	5 10½	6 2¾
Thickness of coal sampled	5 9	5 9¾	5 7½	5 8¾	5 10

a Not included in sample. b Contained streaks of "mother coal" and "sulphur."

Section A (sample 19176) was cut from face of 45 room, northwest entry, 2,700 feet from shaft. Section B (sample 19177) was cut from face of 8 room, 5 west entry, 2,000 feet from shaft. Section C (sample 19178) was cut from face of 24 room, 4 southeast entry, 3,000 feet from shaft. Section D (sample 19179) was cut from face of 29 room, 3 northwest entry, 2,600 feet from shaft. Section E (sample 19180) was cut from face of 7 northeast entry, 2,000 feet from shaft. Section F (sample 19181) was cut from face of 46 room, 1 southeast entry, 3,500 feet from shaft. Section G (sample 19182) was cut from last break-through, 1 northeast entry, 2,100 feet from shaft. Section H (sample 19183) was cut from face of 5 northeast entry, 2,400 feet from shaft. Section I (sample 19184) was cut from face of 3 northeast entry, 2,400 feet from shaft.

The ultimate analysis of a composite sample, made by combining equal amounts of samples 19176 to 19184, inclusive, is given under laboratory No. 19185.

The bed is worked on the room-and-pillar method. In 1914 the daily production was 1,800 tons.

Sebree. Sebree Mine.

Analyses 18967, 18968, and 18969 (pp. 54–55). Bituminous coal, western Kentucky field, from Sebree mine, a shaft mine one-half mile north of Sebree on Louisville & Nashville R. R. Coal bed, No. 9 of Kentucky geological survey; Carboniferous age, Pottsville group. Bed has an average thickness of 4 feet. Immediate roof is 4 inches each of black shale and of fossil shale; main roof is gray shale; floor is underclay. Cover at points of sampling, 170 feet. The bed was sampled by J. T. Ryan on March 26, 1914, as described on page following.

Sections of coal bed in Sebree mine.

Section	A	B
Laboratory No.	18967	18968
Roof, black and gray shale.	Ft. in.	Ft. in.
Coal	7	7
"Sulphur" band	¼	¼
Coal	10	8½
"Sulphur" and coal	.. ..	½
Coal	1 8	1 7¾
Bone and "sulphur"	[a] ¾	½
Coal	10	8
Coal and "sulphur"	.. ..	3½
Floor, soft underclay.		
Thickness of bed	4 0	4 0
Thickness of coal sampled	3 11¼	4 0

[a] Not included in sample.

Section A (sample 18967) was cut from the last room, air course, 2 north entry, main east entry, 1,400 feet from shaft. Section B (sample 18968) was cut from face of 2 north entry, main east entry, 1,600 feet from shaft.

The ultimate analysis of a composite sample, made by combining equal amounts of samples 18967 and 18968, is given under laboratory No. 18969.

In 1914 the daily production was about 60 tons.

Wheatcroft. No. 4 Mine.

Analyses 19119 to 19124 (p. 55). Bituminous coal, western Kentucky field, from No. 4 mine, a slope mine 1,000 feet west of Wheatcroft station on the Illinois Central R. R. Coal bed, No. 11 of the Kentucky geological survey; Carboniferous age, Pottsville group. Dip, 3 per cent, north; cleat, east and west. Occasionally faults and rolls were encountered. Bed averages 5 feet 4 inches thick and contains a number of "sulphur" bands and a characteristic clay parting locally termed "blue band." This parting is 1½ to 2 inches thick and occurs 1½ to 2 feet above the floor. Immediate roof is "draw slate" ranging up to 3 feet 6 inches thick, above which is a limestone cap rock; floor, hard underclay. Cover at points of sampling, 50 to 75 feet. The bed was sampled by A. W. Harris and A. F. Crider on April 8, 1914, as described below:

Sections of coal bed in No. 4 mine.

Section	A	B	C	D	E
Laboratory No.	19119	19120	19121	19122	19123
Roof, limestone.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal, hard	[a] 10	9¼	11	4½	7
"Sulphur"	½	¼	½	[b] ½	[b] 1
Coal with "mother-coal" partings	2 6½	1 6½	2 6	1 3	1 11
"Mother coal"	.. ..	1½	.. ..	1	Streak.
Coal	.. ..	9¾	.. ..	1 2	6
"Blue band"	[b] 1½	[b] 2½	[b] 2	[b] 2	[b] 2
Coal, hard	[a] 2 0	9½	2½	3½	2
"Sulphur"	.. ..	[b] 1	½	Streak.	½
Coal	.. ..	2½	7	7	6½
"Sulphur"	.. ..	[b] ½	[b] 1	[b] ½	[b] ¼
Coal	.. ..	1½	10½	[a] 1 0	9½
"Sulphur"	.. ..	[b] 1	.. ..	.. ..	.. ..
Coal	.. ..	3½	.. ..	.. ..	.. ..
Floor, hard underclay.					
Thickness of bed	5 6½	5 1¾	5 5	5 0	4 10½
Thickness of coal sampled	5 5	4 8¾	5 2	4 9	4 7

[a] Contained "sulphur" or "mother-coal" partings. [b] Not included in sample.

Section A (sample 19119) was cut from face of 64 room, 5 west entry, 5,100 feet from entrance. Section B (sample 19120) was cut from face of 14 room, 6 west entry, 3,000 feet from entrance. Section C (sample 19121) was cut from left rib of 5 west entry,

5,100 feet from entrance. Section D (sample 19122) was cut from face of 4 west entry, 5,000 feet from entrance. Section E (sample 19123) was cut from face of 6 east air course, 2,800 feet from entrance.

The ultimate analysis of a composite sample, made by combining equal amounts of samples 19119 to 19123, is given under laboratory No. 19124.

The mine is worked on the double-entry, room-and-pillar system. In 1914 the coal was undercut by short-wall, electric coal-cutting machines. Occasionally pieces of roof and floor became mixed with the coal in loading. The daily output was 550 tons; maximum day's run, 846 tons. About 65 per cent of the bed was mined in advance work.

MARYLAND.

ALLEGANY COUNTY.

LONACONING. KINGSLAND MINE.

Analyses 20332 to 20336 (p. 55). Semibituminous coal, Georges Creek field, from Kingsland mine, a drift mine, opened on the outcrop, one-half mile north of Lonaconing. Railroad connections to the Georges Creek & Cumberland R. R. Coal bed, Tyson; Carboniferous age, Allegheny group. Average thickness, 3 feet. Roof, hard gray shale, with fairly smooth surface; floor, shale, generally with smooth surface. Faults and rolls are frequent. The coal was sampled by D. J. Parker, on December 4, 1914, as described below:

Sections of coal bed in Kingsland mine.

Section	A	B	C	D
Laboratory No.	20332	20333	20334	20335
Roof, hard gray shale.				
Coal, soft	Ft. in. 9	Ft. in. 5	Ft. in. 2 10½	Ft. in. 2 10½
Slate	.. ..	.. ..	.. ..	[a] 2
"Mother coal"	⅛	.. ..	.. ..	.. ..
"Rash"	.. ..	[a] 2½	.. ..	.. ..
Coal, hard	1 9¾	3 1	.. ..	6
Bone	[a] 4½	.. ..	.. ..	.. ..
Floor, shale.				
Thickness of bed	2 11⅜	3 8½	2 10½	3 6½
Thickness of coal sampled	2 6⅞	3 6	2 10½	3 4½

[a] Not included in sample.

Section A (sample 20332) was cut from face of 4 right entry, 2,600 feet N. 65° W. from pit mouth. Section B (sample 20333) was cut from face of 2 south entry, 1,400 feet N. 71° W. from pit mouth. Section C (sample 20334) was cut from face of 1 north entry, 2,900 feet N. 65° W. from pit mouth. Section D (sample 20335) was cut from face of main entry, 3,500 feet N. 70° W. from pit mouth.

The ultimate analysis of a composite sample, made by combining face samples 20332, 20333, 20334, and 20335, is shown under laboratory No. 20336.

In 1914 the coal was mined by the room-and-pillar system. The vertical depth from the surface to the coal bed is 200 feet. The coal was overcut by hand, and shot down with black powder. The impurities are slate, bone, and rash, all of which seem to occur rather irregularly. The coal separates from the bone with no great difficulty, but the rash may become mixed with the coal, which is all shipped as run-of-mine. The daily output was 250 tons. The capacity of the loading tracks was 22 empty and 22 loaded cars. There was an unmined area of about 800 acres, and the probable lifetime of the mine was estimated at 20 years.

MERTENS. MERTENS MINE.

Analyses 17492 to 17498 (p. 55). Semibituminous coal, Georges Creek field, from Mertens mine, a tunnel mine 500 feet east of Mertens on the Georges Creek & Cumberland R. R., and about a mile from the electric railroad to Cumberland. Coal bed,

"Davis 6-foot," probably equivalent to Lower Kittanning; Carboniferous age, Allegheny series. Average thickness, 6 feet 6 inches; dip, 14 to 22 per cent. The bed has three characteristic shale and bone partings, their total thickness average 1 foot 5 inches, which are excluded in loading the coal. Roof is shale, in places cut out by the sandstone cap rock; floor is hard shale. The coal was sampled by H. I. Smith, on June 24 and 25, 1913, as described below:

Sections of coal bed in Mertens mine.

Section Laboratory No	A 17492	B 17493	C 17494	D 17495	E 17496	F 17497
Roof, shale or sandstone.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	9½	10	8½	8½	8½	.. ..
Bone or shale	a 3½	a 3	a 1½	a 3¾	a 3½	.. ..
Coal	10	1 ¼	1 ¼	11¼	9½	9½
Bone	a 3½	.. ..	.. ..	.. ..	a 2	2½
Shale	a 10	a 9½	a 9½	a 10	a 9½	a 10¼
Coal	.. ..	.. ..	.. ..	.. ..	4	4
Bone	a 4	3	2½	5	a 2½	a 1
Coal	1 5½	7½	1 5	2	1 3½	7½
"Sulphur"	.. ..	¼	.. ..	a ¼	.. ..	Streak.
Coal	.. ..	6¼	.. ..	1 ¼	.. ..	8
Shale	a 1¼	a ¼	a 1½	¼	½	a 5
Coal	5¼	9	7½	1 0	8	5½
"Sulphur" or bone	¼	a ½	a ½	a 1½	½	Streak.
Coal	.. ..	6	.. ..	.. ..	.. ..	.. ..
"Sulphur"	.. ..	a 1	.. ..	.. ..	.. ..	.. ..
Coal	1 7	1 2½	1 1½	11	1 4¾	1 4½
"Sulphur"	.. ..	.. ..	.. ..	.. ..	.. ..	1
Floor, shale.						
Thickness of bed	6 11¾	6 11	6 2¼	6 5¾	6 8¾	5 10¾
Thickness of coal sampled	5 1½	5 8¾	5 1¼	5 2¼	5 3¼	4 6½

a Not included in sample.

Section A (sample 17492) was cut from the face of 4 room, right (Frederick) heading, about 2,150 feet from the tunnel mouth. Section B (sample 17493) was cut from the face of left (Frederick) heading, 150 feet from slope, and about 1,700 feet from end of tunnel. The places where sections A and B were measured had not been worked for several months. Section C (sample 17494) was cut from the face of 12 room, 1 right heading, about 1,450 feet from the end of the tunnel. Room 12 is locally called 3. Section D (sample 17495) was cut from the face of the cross room, 10 room, 1 right heading, about 1,100 feet from the end of the tunnel. Room 10 is locally called 1. Section E (sample 17496) was cut from face of 15 room, locally called 6 room, 1 right heading, about 1,650 feet from end of tunnel. Section F (sample 17497) was cut from the face of 17 room, locally called 8 room, 1 right heading, about 1,850 feet from end of tunnel.

The ultimate analysis of a composite sample, made by mixing equal parts of samples 17492 to 17497, is given under laboratory No. 17498.

Four beds of coal are tributary to the Mertens mine, three of which, termed locally the Davis 4-foot, the Davis 6-foot, and the Davis 5-foot, were developed by a tunnel about 2,900 feet long. The top of the Davis 4-foot had been opened only a little. The Davis 6-foot was developed by a 2,700-foot plane to the outcrop on the opposite side of the mountain. This plane has a maximum grade of 22 per cent. The entire output of the mine was coming from a heading to the right of this plane. The Davis 5-foot was developed by a continuation of the tunnel through the Davis 6-foot, but coal had not been mined from the 5-foot bed for some time. Below the Davis 5-foot is the Davis 9-foot, which had not been opened. The coal was undercut by hand, shot down with black blasting powder, and occasionally with dynamite. The entire output was shipped as run of mine. No screening plant in use and no pickers employed on the cars in loading. There was one loading and one empty track, holding about 10 cars. Coal looked bright and was easily crushed. Daily output, at time of sampling, 50 tons; maximum day's run, 300 tons.

GARRETT COUNTY.

DODSON. DODSON MINE.

Analyses 17647 to 17654 (pp. 55–56). Bituminous coal, Potomac field, from Dodson mine, a drift mine at Dodson, one-half mile west of Harrison, W. Va., on the Western Maryland R. R. Two coal beds—Lower Kittanning, in drifts 1 and 3, and Upper Kittanning, in drift 5; Carboniferous age, Allegheny group. Average thickness of Lower Kittanning as mined, in haulage ways 6 feet 1 inch, in other parts of mine, 4 feet, of which about 5 inches was excluded in loading. Two feet of coal and shale at the top was left unmined in the rooms. Roof is shale, in places cut out by sandstone; floor, hard smooth underclay. The Lower Kittanning was measured and sampled at six places and the Upper Kittanning at one place by H. I. Smith on August 18 to 20, 1913, as described below:

Sections of Lower Kittanning bed in Dodson mine.

Section	A	B	C	D	E	F
Laboratory No.	17547	17650	17651	17652	17649	17648
Roof, main, sandstone; roof in haulage ways, shale or sandstone.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Top coal	[a] 10	[a] 10	[a] 8	(b)	[a] 9½	[a] 1 2
Shale roof in room	[a] 1 6	[a] 1 0	[a] 1 6	(b)	[a] 1 3	[a] 1 1½
Coal	4½	2¼	3½	.. ..	.. ..	.. ..
"Sulphur"	[a] ⅛	Streak.	Streak.	.. ..	.. ..	.. ..
Coal	5¼	6¼	4½	8	8	4½
Bone	[a] 2	[a] 2	[a] 1	[a] 1½	¾	[a] 2
Coal	4½	4	6½	[a] 2	4¾	3½
Shale binder	[a] 1½	[a] 1	[a] 1½	[a] 2	[a] 2	[a] ½
Coal	3	.. ..	.. ..	[a] ¾	.. ..	2½
"Sulphur"	Streak.	.. ..	.. ..	[a] ¼	.. ..	⅛
Coal	1 1	1 3½	1 3½	1 1½	1 3½	1 2½
Shale binder	[a] 1¼	[a] 1½	[a] 2	1¾	[a] 1½	[a] 1½
Coal	7¼	8	6	1 3	6½	8¾
"Sulphur"	⅛	Streak.	½	.. ..	[a] ½	Streak.
Coal	7½	5¾	8½	.. ..	4¼	3½
"Sulphur"	.. ..	.. ..	.. ..	.. ..	[a] Streak.	⅛
Coal	.. ..	.. ..	.. ..	.. ..	[a] 2	5½
Floor, hard underclay.						
Thickness of bed	6 6½	5 8¼	6 3½	3 8¾	5 10	6 2½
Thickness of coal sampled	3 9⅜	3 5¾	3 9	3 2¼	3 3½	3 7

[a] Not included in sample.
[b] Top coal and shale not measured. Top coal mined and loaded in haulage way only, not included in sample.

Section of Upper Kittanning bed in Dodson mine.

Laboratory No.	17654
Roof, 25 feet.	Ft. in.
Bone	2
Coal	3¼
"Sulphur"	Streak.
Coal	1 3
"Mother coal"	⅛
Coal	2 1
Bone	[a] 1
Floor, underclay.	
Thickness of bed	3 10½
Thickness of coal sampled	3 9½

[a] Not included in sample.

Section A (sample 17647) was cut in face of 14 room, 11 right entry, 4,300 feet northwest of entrance. Section B (sample 17650) was cut in face of 17 room, 10 left entry, 4,300 feet west of entrance. Section C (sample 17651) was cut in face of 31 room, 9 right entry, 4,700 feet northwest of entrance. Section D (sample 17652) was cut in face of 3 left air course, 600 feet ahead of 2 parallel, 3,000 feet southwest of 1 opening.

Section E (sample 17649) was cut in pillar 30 feet inby 41 room, 7 right entry, 4,600 feet northwest of opening. Section F (sample 17648) was cut in face of main heading air course, about 800 feet from 3 opening. Section G (sample 17654) was cut near face of main entry in Upper Kittanning bed, about 200 feet from mouth of 5 opening.

An ultimate analysis of a composite sample made by combining equal amounts of samples 17647 to 17652 is given under laboratory No. 17653.

Mining system, room-and-pillar; coal cut by hand between shale binders, and top and bottom blasted with black blasting powder; dynamite used for brushing roof. Daily output at time of sampling, 300 tons, 50 tons of which was from advance work, remainder from pillars. Output all shipped as run-of-mine. Tipple had a swing-car dump and coal passed to a shaker screen, with bars 8 feet long, spaced 4 inches apart. Coal passing over this screen was broken and impurities were removed. The coal then went to a picking table connected directly with the shaker screen. At times six pickers were employed, four at the table and two on the cars. There were no storage bins and only one loading track. Twenty or more empty cars could be run in and loaded without shifting. Maximum day's run, 700 tons.

MISSOURI.[a]

BARTON COUNTY.

PITTSBURG (KANS.). J. J. STEPHENSON MINE.

Analyses 23241 to 23243 (p. 56). Bituminous coal, Minden field, from a steam-shovel strip pit, 4 miles east and 3 miles north of Pittsburg, Kans. Coal bed, locally known as Cherokee; average thickness, 36 inches. Carboniferous (Pennsylvanian) age, Cherokee shale. The bed was sampled October 23, 1915, by C. E. Lesher, as described below:

Sample 23241, which included the total thickness of the bed, 36 inches of good coal, was cut at the working face; it represents best quality strip-pit coal. Sample 23242 was cut 1,000 feet east from tipple along fault, and was from the upper 28 inches of the bed and represented weathered coal, locally known as "dead" coal. Sample 23243 was cut 200 feet from east line of pit, and represented what is locally termed "shelly" coal, intermediate in quality between 23241 and 23242. The "dead" coal is used locally by zinc smelters for mixing with the ore in the retorts.

MONTANA.

BIG HORN COUNTY.

SANDERS. PROSPECT.

Analysis 17711 (p. 56). Subbituminous coal, Tullock Creek field, from local strip pit in sec. 30, T. 1 N., R. 38 E., 36 miles south of Sanders station on the Northern Pacific Ry. Coal bed, "M"; Tertiary age, Fort Union formation. Roof, shale; floor, shale. The bed lies flat. It was sampled August 27, 1913, by a cut 6 feet deep at a face of the pit, by G. S. Rogers, as shown on page following.

[a] The coal fields of Missouri are described in detail in The Coal Deposits of Missouri, by Henry Hinds, Missouri Bureau of Geology and Mines, vol. 11, ser. 2, 1913.

Section of "M" bed in strip pit.

	Ft.	in.
Roof, shale.		
Coal	[a]1	4
Shale		[a]7
Shale, brown		[a]6
Shale, carbonaceous		[a]4
Bone		[a]1
Coal	[a]1	2
Bone		[a]2
Coal	7	0
Coal, weathered	[a]3	4
Not exposed, coal reported in drill record	[a]21	0
Coal		[a]6
Shale		[a]2
Coal	[a]1	2
Floor, shale.		
Total thickness of bed	37	4
Thickness of coal sampled	7	0

[a] Not included in sample.

CARBON COUNTY.

Bear Creek. International Mine.

Analyses 18691 to 18694 (p. 57). Subbituminous coal, Red Lodge field, from International mine, three-quarters mile northwest of Bear Creek in sec. 31, T. 7 S., R. 21 E., and on the Montana, Wyoming & Southern Ry. Coal bed, "No. 3"; Tertiary age, Fort Union formation. Average thickness, 5 feet 8 inches; dip variable; coal lying in a saucer-shaped basin. Roof, dark-blue shale; floor, soft underclay. Cover at points of sampling, 110 to 175 feet. The bed was sampled by J. M. Anderson on February 16 and 17, 1914, as described below:

Sections of coal bed in International mine.

Section	A		B		C		D	
Laboratory No	18691		18692		18693		18823	
Roof, shale.	Ft.	in.	Ft.	in.	Ft.	in.	Ft.	in.
Coal	..	..	..	..	..	..	2	3
Dark-gray shale	..	..	..	..	..	..	..	½
Clean coal	2	4	2	3½	3	5½	1	0
Dark-gray shale	..	..	..	..	..	..		½
Clay	..	..		¼	..	..	..	..
Clean coal	..	..	2	5	..	..	1	5
Dark shale		½		¼		¼		¼
Clean coal	3	2½		9½	1	4½		9
Dark shale parting ("black jack")	..	..		¼		¼	..	..
Clean coal	..	..		2¼		10½	..	..
Floor, soft underclay.								
Thickness of bed	5	7	5	9	5	9	5	6
Thickness of coal sampled	5	7	5	9	5	9	5	6

Section A (sample 18691) was cut in face of 6 room, 2 west entry, slope, 975 feet west of opening. Section B (sample 18692) was cut in face of 4 west entry, main incline, 2,400 feet northwest of opening. Section C (sample 18693) was cut in rib between 32 and 33 rooms, 2 west entry, main incline, 3,200 feet northwest of opening. Section D (sample 18823) was cut at face of 16 room, 3 west entry, 2,700 feet northwest of the opening.

The ultimate analysis of a composite sample made by combining equal portions of samples 18692 and 18693 is given under laboratory No. 18694.

The coal is so well jointed that it can be broken into merchantable sizes with little slack. It has the average hardness of subbituminous coal and is free from pyrite nodules. Only a little powder is needed in mining. The daily output at the time of sampling was 450 to 500 tons.

For chemical analysis of another sample of the coal from this mine, see Bureau of Mines Bull. 22, 1913, p. 124.

For geologic relations of the coal, see U. S. Geol. Survey Bull. 341, 1909, p. 94.

CHOUTEAU COUNTY.

VIRGELLE. DEDA MINE.

Analysis 19790 (p. 57). Subbituminous coal, Judith River field, from Deda mine, in sec. 6, T. 24 N., R. 13 E., about 16 miles southeast of Virgelle on the Great Northern Ry. Coal bed, not named; Upper Cretaceous age, near middle of Eagle sandstone. The bed was sampled by E. R. Lloyd on August 28, 1914, as described below:

Section of coal bed in Deda mine.

	Ft.	in.
Roof, shale.		
Coal		7¾
Bone		[a] 2½
Coal	1	8
Floor, shale.		
Thickness of bed	2	6
Thickness of coal sampled	2	3¾

[a] Excluded from sample.

The sample was collected in main entry, about 175 feet south and 50 feet east of mine mouth. In 1914 the mine was being worked to supply a local demand. The output was small.

VIRGELLE. PRICE SEXTON MINE.

Analysis 19795 (p. 57). Subbituminous coal, Judith River field, from Price Sexton mine, in SW. ¼ sec. 17, T. 24 N., R. 13 E., about 20 miles southeast of Virgelle on the Great Northern Ry. Coal bed, not named; Cretaceous age, near the middle of Eagle sandstone. Thickness at point of sampling, 1 foot 5 inches. Roof and floor, shale. The bed was sampled by E. R. Lloyd on September 4, 1914. The sample was taken in the main entry about 50 feet south of the mine mouth and represented the whole thickness of the bed; it was slightly weathered.

A small amount of coal is mined each fall for local use.

DAWSON COUNTY.

JORDAN. FOSTER PROSPECT.

Analysis 19923 (p. 57). Subbituminous coal, Jordan field, from Foster prospect, in SW. ¼ sec. 18, T. 18 N., R. 38 E., 1 mile west of Jordan and 90 miles north of Miles City, the nearest railroad station, on the Northern Pacific Ry. and the Chicago, Milwaukee & St. Paul Ry. Coal bed, not named; Tertiary age, Fort Union formation. Thickness, 6¼ feet. Roof, sandstone with a thin bed of shale below; floor, shale. The bed was sampled by C. F. Bowen and C. A. Bonine on October 4, 1914, as described below:

Section of coal bed at Foster prospect.

	Ft.	in.
Roof, shale and sandstone.		
Coal		[a] 2½
Shale, carbonaceous		[a] 2
Coal		[a] 2
Sandstone		[a] ½
Coal	[a] 1	3
Shale		[a] 8
Coal	2	4
Shale	[a]	0
Coal		5½
Bone		[a] 1½
Coal		8
Floor, shale.		
Thickness of bed	8	1
Thickness of coal sampled	3	5½

[a] Not included in sample.

The sample was taken about 15 feet from the working face and 50 feet from the mouth of the mine. No mining had been done for two or three months, and the sample may have been slightly weathered.

FALLON COUNTY.

CAMP CROOK (S. DAK.). HORNER MINE.

Analysis 20370 (p. 57). Lignite from Horner open pit in SE. ¼ sec. 12, T. 3 S., R. 62 E. (unsurveyed), about 4½ miles northwest of Camp Crook, S. Dak. Lignite bed, Kerr; Tertiary age, at base of Fort Union formation. Thickness variable. Roof, sandstone; floor, clay. Bed lies nearly flat, dipping a degree or less northeast. The bed was sampled by E. M. Parks on November 24, 1914, as shown below:

Section of lignite bed in Horner mine.

	Ft.	in.
Roof, sandstone.		
Lignite		4
Lignite, brown, woody	1	7
Bone		1
Lignite		6
Lignite, bony		[a] 6
Lignite	1	2
Clay		[a] 5½
Lignite		4
Clay		[a] ½
Lignite		8½
Floor, clay.		
Thickness of bed	5	8½
Thickness of lignite sampled	4	8½

[a] Not included in sample.

The sample was taken in the open pit.

CAMP CROOK (S. DAK.). KERR MINE.

Analysis 20372 (p. 57). Lignite, from Kerr open pit in NW. ¼ sec. 11, T. 3 S., R. 62 E. (unsurveyed), about 4½ miles northwest of Camp Crook, S. Dak. Kerr bed; Tertiary age, at base of Fort Union formation. Thickness variable. Bed lies nearly flat, dipping a degree or less northeast. It was sampled in the pit by E. M. Parks on November 24, 1914, as shown below:

Section of lignite bed in Kerr mine.

	Ft.	in.
Roof, sandstone.		
Lignite	3	10
Shale		¾
Lignite		8
Shale		[a] 1¾
Lignite	1	3
Floor, shale.		
Thickness of bed	5	11½
Thickness of lignite sampled	4	6¾

[a] Not included in sample.

The sample was taken at the surface of the open pit.

FERGUS COUNTY.

WINIFRED. CALDERWOOD MINE.

Analysis 20000 (p. 57). Subbituminous coal, Judith River field, from Calderwood mine, in sec. 31, T. 22 N., R. 19 E. (unsurveyed), 5 miles northeast of Winifred, the terminus of a branch of the Chicago, Milwaukee & St. Paul Ry. Coal bed, unnamed; Cretaceous age, near top of Judith River formation. Roof, bone; floor, bone. The bed was sampled by E. R. Lloyd on October 17, 1914.

Section of coal in Calderwood mine.

	Ft.	in.
Roof in entry, bone.		
Coal		[a] 7
Bone		[a] 7
Coal		[a] 7
Bone, roof in room		[a] 8
Coal	2	1
Floor, bone.		
Thickness of bed	4	6
Thickness of coal sampled	2	1

[a] Not included in sample.

The sample was taken in a room about 50 feet east of the mine mouth.

At the time of sampling the mine had been newly opened to supply a local demand.

Winifred. Millsap Mine.

Analysis 22622 (p. 57). Bituminous coal, Winifred field, from Millsap mine, in sec. 12, T. 22 N., R. 16 E., about 4 miles south of Missouri River, and about 20 miles northeast of Chicago, Milwaukee & St. Paul Ry. at Winifred. Coal bed, unnamed; Cretaceous age, in Eagle sandstone. It was sampled July 13, 1915, by E. Stebinger, as shown below:

Section of coal bed in Millsap mine.

	Ft.	in.
Roof, shale.		
Coal, impure		[a] 2
Coal		9
Bone		[a] 1
Coal	1	3
Coal, bony		4
Bone		[a] 5
Coal	[a] 1	2
Clay		[a] 1
Coal		[a] 2
Clay		[a] 2
Coal		[a] 9
Floor, shale.		
Thickness of bed	5	4
Thickness of coal sampled	2	4

[a] Not included in sample.

The sample, which was weathered, was taken on the left wall of entry, 10 feet from mine mouth.

For geologic relations of this coal see U. S. Geol. Sur. Bull. 541, 1914, pp. 329–337.

Winifred. Prospect.

Analysis 22548 (p. 57). Subbituminous coal, Winifred field, from a prospect in NE. ¼ sec. 23, T. 21 N., R. 18 E., 1½ miles north of Winifred, 15 miles south of Missouri River, and about 1½ miles north of Chicago, Milwaukee & St. Paul Ry. at Winifred. Coal bed, not named; Cretaceous age, Judith River formation. Roof, clay; floor, shale. The bed was sampled June 29, 1915, by E. Stebinger, as shown below:

Section of coal bed in prospect 1½ miles north of Winifred.

	Ft.	in.
Roof, clay.		
Coal		[a] 7
Shale	[a] 1	1
Coal	[a] 1	0
Coal, impure	[a] 2	0
Coal	2	2
Coal, impure		[a] 8
Floor, shale.		
Thickness of bed	7	6
Thickness of coal sampled	2	2

[a] Not included in sample.

The sample, which was weathered, was taken from right wall of entry, 75 feet from mine mouth.

For geologic relations of this coal see U. S. Geol. Survey Bull. 541, 1914, pp. 329–337.

WINIFRED. PROSPECT.

Analysis 22566 (p. 57). Subbituminous coal, Winifred field, from a prospect in sec. 36, T. 21 N., R. 18 E., on Dog Creek about 1½ miles southeast of Winifred, terminus of a branch of the Chicago, Milwaukee & St. Paul Ry. Coal bed, no name; Cretaceous age, Judith River formation. Roof, shale; floor, shale. The bed was sampled June 30, 1915, by E. Stebinger, as shown below:

Section of coal bed in prospect 1½ miles southeast of Winifred.

	Ft.	in.
Roof, shale.		
Bone		[a] 6
Coal	1	11
Bone		[a] 7
Shale		[a] 9
Coal		[a] 9
Floor, shale.		
Thickness of bed	4	6
Thickness of coal sampled	1	11

[a] Not included in sample.

The sample was weathered.

For geologic relations of this coal see U. S. Geol. Survey Bull. 541, 1914, pp. 329–337.

WINIFRED. PROSPECT.

Analysis 22550 (p. 57). Subbituminous coal, Winifred field, from a prospect in sec. 24, T. 21 N., R. 18 E., on the east side of Dog Creek, and 2½ miles northeast of Winifred, terminus of a branch of the Chicago, Milwaukee & St. Paul Ry. Coal bed, not named; Cretaceous age, Judith River formation. Roof, shale; floor, clay. This bed was sampled July 1, 1915, by E. Stebinger, as shown below:

Section of coal bed in prospect 2½ miles northeast of Winifred.

	Ft.	in.
Roof, clay shale.		
Coal, impure		6
Coal		11
Coal, bony		8
Coal		9
Floor, clay.		
Thickness of bed	2	10
Thickness of coal sampled	2	10

The sample was weathered.

For geologic relations of this coal see U. S. Geol. Survey Bull. 541, 1914, pp. 329–337.

WINIFRED. PROSPECT.

Analysis 22619 (p. 58). Subbituminous coal, Winifred field, from an outcrop in sec. 12, T. 21 N., R. 18 E., about 5 miles north of Winifred, terminus of a branch of the Chicago, Milwaukee & St. Paul Ry. Coal bed not named; Cretaceous age, Judith River formation. Roof, shale; floor, shale. The bed was sampled on July 8, 1915, by E. Stebinger. The sample, representing a bed 1 foot 9 inches thick, was weathered.

For geologic relations of this coal see U. S. Geol. Survey Bull. 541, 1914, pp. 329–337.

WINIFRED. PROSPECT.

Analysis 22620 (p. 58). Subbituminous coal, Winifred field, from a prospect in sec. 25, T. 22 N., R. 17 E., about 9 miles northwest of Winifred, the terminus of a branch of the Chicago, Milwaukee & St. Paul Ry. Coal bed not named; Cretaceous age, Judith River formation. The bed was sampled July 4, 1915, by E. Stebinger, as shown below:

Section of coal bed in prospect 9 miles northwest of Winifred.

	Ft.	in.
Roof, shale.		
Coal, impure		[a] 11
Clay		[a] 4
Coal		[a] 7
Bone		[a] 10
Coal		[a] 6
Bone		[a] 4
Coal		[a] 8
Bone	[a] 1	4
Coal	1	10
Floor, shale.		
Thickness of bed	7	4
Thickness of coal sampled	1	10

[a] Not included in sample.

For geologic relations of this coal bed see U. S. Geol. Survey Bull. 541, 1914, pp. 329–337.

WINIFRED. PROSPECT.

Analysis 22621 (p. 58). Subbituminous coal, Winifred field, from a prospect in sec. 12, T. 21 N., R. 19 E., 9 miles northeast of Winifred, terminus of a branch of the Chicago, Milwaukee & St. Paul Ry., and 10 miles south of Missouri River. Coal bed not named; Cretaceous age, Judith River formation. Roof, clay; floor, shale. The bed was sampled July 5, 1915, by E. Stebinger. The sample represented the entire thickness of the bed, 2 feet 6 inches.

For geologic relations of this coal see U. S. Geol. Survey Bull. 541, 1914, pp. 329–337.

WINIFRED. PROSPECT.

Analysis 22549 (p. 58). Subbituminous coal, Winifred field, from a prospect in sec. 24, T. 21 N., R. 19 E., 20 miles south of Missouri River and about 10 miles northeast of Chicago, Milwaukee & St. Paul Ry. at Winifred. Coal bed, not named; Cretaceous age, Judith River formation. Roof, shale; floor, clay. The bed was sampled July 2, 1915, by E. Stebinger, as shown below:

Section of coal bed in prospect 10 miles northeast of Winifred.

	Ft.	in.
Roof, clay shale.		
Coal		8
Bone		[a] 8
Coal		10
Bone		[a] 6
Coal	2	6
Floor, clay.		
Thickness of bed	5	2
Thickness of coal sampled	4	0

[a] Not included in sample.

The sample was weathered.

For geologic relations of this coal see U. S. Geol. Survey Bull. 541, 1914, pp. 329–337.

WINIFRED. PROSPECT.

Analysis 22565 (p. 58). Bituminous coal, Winifred field, from a prospect in NW. ¼ sec. 5, T. 22 N., R. 17 E., on Dog Creek about 4 miles southeast of Judith and about 20 miles northwest of Winifred, a terminus of a branch of Chicago, Milwaukee & St. Paul Ry.

Coal bed, not named; Cretaceous age, Eagle sandstone. Roof, shale; floor, shale. The bed was sampled July 12, 1915, by E. Stebinger, as shown below:

Section of coal bed in prospect 20 miles northwest of Winifred.

	Ft.	in.
Roof, shale.		
Coal	1	1
Clay	[a]	½
Coal		5
Clay	[a]	2
Coal		4
Floor, shale.		
Thickness of bed	2	½
Thickness of coal sampled	1	10

[a] Not included in sample.

The sample was weathered.

For geologic relations of this coal see U. S. Geol. Survey Bull. 541, 1914, pp. 329–337.

WINIFRED. OUTCROP.

Analysis 22588 (p. 58). Bituminous coal, Winifred field, from an outcrop in SW. ¼ sec. 6, T. 22 N., R. 17 E., near Dog Creek, about 3 miles southeast of Judith and about 23 miles northwest of Winifred, a terminus of a branch of the Chicago, Milwaukee & St. Paul Ry. Coal bed, not named; Cretaceous age, Eagle sandstone. Roof, shale; floor, shale. The bed was sampled July 10, 1915, by E. Stebinger, as shown below:

Section of coal bed at outcrop 23 miles northwest of Winifred.

	Ft.	in.
Roof, clay shale.		
Coal	1	11
Clay shale	[a] 1	1
Coal	1	1
Floor, shale.		
Thickness of bed	4	1
Thickness of coal sampled	3	0

[a] Not included in sample.

The sample was weathered.

For geologic relations of this coal see U. S. Geol. Survey Bull. 541, 1914, pp. 329–337.

HILL COUNTY.

HAVRE. PROSPECT.

Analysis 23002 (p. 58). Subbituminous coal, Milk River field, from a prospect in NW. ¼ sec. 7, T. 35 N., R. 13 E., about 30 miles northwest of Havre on Milk River and the Great Northern Ry. Coal bed, not named; Cretaceous age, Judith River formation. Roof, clay; floor, shale. The bed was sampled September 15, 1915, by E. Stebinger. The sample was weathered and represented the entire thickness, 1 foot 6 inches, of the bed.

For geologic relations of this coal see U. S. Geol. Survey Bull. 381, 1910, pp. 82–107.

HAVRE. PROSPECT.

Analysis 22798 (p. 58). Subbituminous coal, Milk River field, from a prospect in sec. 20, T. 37 N., R. 15 E., about 30 miles northwest of Havre, on Milk River and the Great Northern Ry. Coal bed, not named; Cretaceous age, Judith River formation. Roof, shale; floor, shale. The bed was sampled October 11, 1915, by E. Stebinger. The sample was weathered and represented the entire thickness, 2 feet 3 inches, of the bed.

For geologic relations of this coal see U. S. Geol. Survey Bull. 381, 1910, pp. 82–107.

HAVRE. PROSPECT.

Analysis 22797 (p. 58). Subbituminous coal, Milk River field, from a prospect in SW. ¼ NW. ¼ sec. 27, T. 35 N., R. 14 E., about 15 miles northwest of Havre, on the Great Northern Ry. Coal bed, no name; Cretaceous age, Judith River formation. Roof, shale; floor, shale. The bed was sampled September 25, 1915, by E. Stebinger, as shown below:

Section of coal bed in prospect 15 miles northwest of Havre.

	Ft.	in.
Roof, shale.		
Coal	1	4
Clay	[a]	4
Coal, impure	[a]	9
Floor, clay shale.		
Thickness of bed	2	5
Thickness of coal sampled	1	4

[a] Not included in sample.

The sample was weathered.

For geologic relations of this coal see U. S. Geol. Survey Bull. 381, 1910, pp. 82–107.

HAVRE. PROSPECT.

Analysis 22794 (p. 59). Subbituminous coal, Milk River field, from a prospect in NW. ¼ NE. ¼ sec. 29, T. 35 N., R. 14 E., about 16 miles northwest of Havre. Coal bed, not named. Cretaceous age, Judith River formation. Roof, shale; floor, shale. The bed was sampled September 25, 1915, by E. Stebinger, as shown below:

Section of coal bed in prospect 16 miles northwest of Havre.

	Ft.	in.
Roof, shale.		
Coal, impure	[a]	9
Shale, slightly coaly	[a] 1	2
Coal, impure	1	4
Floor, brownish gray shale.		
Thickness of bed	3	3
Thickness of coal sampled	1	4

[a] Not included in sample.

The sample was weathered.

For geologic relations of this coal see U. S. Geol. Survey Bull. 381, 1910, pp. 82–107.

HAVRE. PROSPECT.

Analysis 22793 (p. 59). Subbituminous coal, Milk River field, from a prospect in SW. ¼ SW. ¼ sec. 22, T. 35 N., R. 14E., about 16 miles northwest of Havre. Coal bed, not named; Cretaceous age, Judith River formation. Roof, carbonaceous shale; floor, brown carbonaceous shale. Thickness where sampled, 2¼ feet. The sample was taken September 8, 1915, by E. Stebinger and represented 1 foot 8 inches of weathered coal. There was 7 inches of bony coal below the part sampled.

For geologic relations of this coal see U. S. Geol. Survey Bull. 381, 1910, pp. 82–107.

HAVRE. PROSPECT.

Analysis 22796 (p. 59). Subbituminous coal, Milk River field, from a prospect in NW. ¼ SW. ¼ sec. 28, T. 35 N., R. 14 E., about 16 miles northwest of Havre. Coal bed, not named; Cretaceous age, Judith River formation. Thickness, 4 feet. Roof, clay shale; floor, carbonaceous shale. The sample was taken September 20, 1915, by E. Stebinger and represented 1 foot 10 inches of weathered coal. There was 2 feet 2 inches of impure coal above the part sampled.

For geologic relations of this coal see U. S. Geol. Survey Bull. 381, 1910, pp. 82–107.

HAVRE. PROSPECT.

Analysis 22799 (p. 59). Subbituminous coal, Milk River field, from a prospect in SW. ¼ SW. ¼ sec. 31, T. 35 N., R. 14 E., about 17 miles northwest of Havre. Coal bed, not named; Cretaceous age, Judith River formation. Roof and floor, shale. The bed was sampled September 26, 1915, by E. Stebinger, as shown below:

Section of coal bed 17 miles northwest of Havre.

	Ft.	in.
Roof, shale.		
Coal	1	3
Shale, carbonaceous	[a]	5
Coal		7
Clay, brown	[a]	2
Coal	[a]	3
Floor, shale.		
Thickness of bed	2	8
Thickness of coal sampled	1	10

[a] Not included in sample.

The sample was weathered.

For geologic relations of this coal see U. S. Geol. Survey Bull. 381, 1910, pp. 82–107.

HAVRE. WHEATMAN MINE.

Analysis 22795 (p. 59). Subbituminous coal, Milk River field, Wheatman mine, in NW. ¼ sec. 23, T. 36 N., R. 14 E., about 28 miles northwest of Havre. Coal bed, not named; Cretaceous age, Judith River formation. Both roof and floor are shale. The sample was cut September 27, 1915, by E. Stebinger, at the foot of a slope 200 feet from the mine mouth in weathered coal 3 feet 2 inches thick.

For geologic relations of this coal see U. S. Geol. Survey Bull. 381, 1910, pp. 82–107.

RUDYARD (GOLDSTONE P. O.). BANKS & SEVERN MINE (LOCAL).

Analysis 17841 (p. 59). Subbituminous coal, Milk River field, from Banks & Severn mine, an old drift mine on Canadian Coulee in NW. ¼ sec. 28, T. 37 N., R. 9 E., 28 miles north of Rudyard on the main line of the Great Northern Ry. Coal bed, "No. 1"; Upper Cretaceous age, Judith River formation. Bed is nearly horizontal. Roof, clay; floor, sandstone. The bed was sampled by Eugene Stebinger on September 30, 1913, as shown below:

Section of coal bed at old mine.

	Ft.	in.
Roof, gray clay.		
Coal, clean, with dull luster and brown streak	[a]	
Coal, slightly banded	3	2
Coaly shale	[b]	5
Floor, soft, gray, clayey sandstone.		

[a] Not measured. [b] Not included in sample.

The sample was cut in first room on right of "new" entry, 75 feet from the outcrop and the mouth of entry. Cover about 200 feet thick at point of sampling.

In 1913 considerable coal for local use was sold, the maximum production being about 30 tons a day in the fall and early winter. Coal was shot from the solid.

For geologic relations of this coal, see U. S. Geol. Survey Bull. 381, 1910, pp. 86-87.

RUDYARD (GOLDSTONE P. O.). OUTCROP.

Analysis 17892 (p. 59). Subbituminous coal, Milk River field, from an outcrop at the bottom of a sharply cut coulee in the bad lands on the south side of Milk River, SW. ¼ sec. 2, T. 37 N., R. 9 E., 32 miles north of Rudyard station on the Great

Northern Ry. Coal bed, "No. 1"; Upper Cretaceous age, Judith River formation, at the same horizon as the bed mined at the old mine in the same township, and lies nearly horizontal. Roof and floor, gray clay. The bed was sampled by Eugene Stebinger on September 28, 1913. The sample represented 2 feet 8 inches of coal that seemed to be very dirty. There was 4 inches of coaly shale below the part sampled. The sample was weathered.

SHELBY (WEST BUTTE POST OFFICE). WEST BUTTE MINE.

Analysis 17842 (p. 59). Bituminous coal, Milk River field, from West Butte mine, a shaft mine in NW. ¼ sec. 6, T. 36 N., R. 2 E., near West Butte post office, and 35 miles northeast of Shelby. Coal bed, a small bed of limited extent near the top of the Virgelle sandstone; Upper Cretaceous age. The bed varies from 2 to 2½ feet thick, has 9 inches of "shell marl" immediately above it, and is underlain with 4 inches of fissile coaly shale and then gray clay. The bed dips 5° S. It was sampled by Eugene Stebinger on September 11, 1913. The sample represented 2 feet 1 inch of weathered coal. There was 4 inches of coaly shale beneath. The coal is clean and hard, with well-developed joint planes, causing it to block well. It remains firm after long exposure. The sample was taken from a point 100 feet north of shaft under 70 feet of cover.

In September, 1913, the shaft was 70 feet deep and hoisting was by means of a bucket and horsepower. Seven men were working, the product being sold for local use and competing successfully with coal from the Great Falls, Mont., field, and the Lethbridge field in Alberta.

MUSSELSHELL COUNTY.

LAVINIA. BENNETT MINE.

Analysis 19784 (p. 59). Subbituminous coal, Bull Mountain field, from Bennett mine, a slope mine in sec. 24, T. 7 N., R. 22 E., 2 miles north of Lavinia, on the Chicago, Milwaukee & St. Paul Ry. Coal bed, not named; Upper Cretaceous age, Judith River formation. Thickness, about 2 feet; dip, 25° NE. Roof, sandstone, which stands well; floor, dark, hard shale. Cover at point of sampling, about 50 feet. The bed was sampled at a point 150 feet down slope in a small room to left by C. E. Lesher on August 12, 1914. The sample represented 1 foot 10½ inches of coal. There was 3½ inches of bony coal below the part sampled. The coal shows bright and dull layers.

LAVINIA. CALDWELL MINE.

Analysis 19785 (p. 59). Subbituminous coal, Bull Mountain field, from Caldwell mine, a slope mine in sec. 8, T. 8 N., R. 20 E., 18 miles northwest of Lavinia Station, Chicago, Milwaukee & St. Paul Ry. Coal bed, unnamed; Tertiary (Eocene?) age, Lance formation. Thickness, 3 feet; dip, 2° to 4°. Roof, sandy shale 2 feet thick, overlain with heavy sandstone; floor, shale. Cover at point of sampling, about 40 feet. The bed was sampled by C. E. Lesher on August 11, 1914, as described below:

Section of coal bed in Caldwell mine.

	Ft.	in.
Roof, sandy shale.		
Coal, bony		9
Sandstone		[a]4
Coal		5
Coal, bony		9
Coal		10
Floor, shale.		
Thickness of bed	3	1
Thickness of coal sampled	2	9

[a] Not included in sample.

The sample was cut at a point 40 feet down the slope.

ROUNDUP. KEENE MINE.

Analysis 17589 (p. 59). Subbituminous coal, Bull Mountain field, from Keene mine, in sec. 28, T. 8 N., R. 25 E., 3½ miles southwest of Roundup, on a spur of the Chicago, Milwaukee & St. Paul Ry. Coal bed, Roundup; Tertiary age, Fort Union formation. The bed averages about 3 feet thick and has no persistent partings. Roof, sandstone; floor, sandy shale. The bed was sampled by C. T. Lupton on July 19, 1913. The sample was taken from a place about 500 feet northeast of mouth of mine, at the side of the entry, and represented the whole thickness of the bed.

For geologic relations of this coal, see U. S. Geol. Survey Bull. 647, 1917, p. 38.

ROUNDUP. REPUBLIC NO. 2 MINE.

Analysis 17586 (p. 59). Subbituminous coal, Bull Mountain field, from the Republic No. 2 mine, in SE. ¼ sec. 36, T. 8 N., R. 25 E., 3½ miles southeast of Roundup, at Klein, on a spur of the Chicago, Milwaukee & St. Paul Ry. Coal bed, Roundup; Tertiary age, Fort Union formation. Average thickness, about 5 feet 10 inches. Roof, sandy clay-shale; floor, sandy shale. The bed was sampled by C. T. Lupton on July 21, 1913, as described below:

Section of coal bed in Republic No. 2 mine.

	Ft.	in.
Roof, clay-shale, sandy.		
Coal	4	3
Bone		[a]1
Coal	1	6
Floor, sandy shale.		
Thickness of bed	5	10
Thickness of coal sampled	5	9

[a] Not included in sample.

Sample 17586 was taken 800 feet east of the foot of the shaft.

For geologic relations of this coal, see U. S. Geol. Survey Bull. 647, 1917, p. 38.

ROUNDUP. NO. 3 MINE.

Analysis 17588 (p. 59). Subbituminous coal, Bull Mountain field, from Roundup No. 3 mine, in NW. ¼ sec. 23, T. 8 N., R. 25 E., one-half mile west of Roundup, on a spur of the Chicago, Milwaukee & St. Paul Ry. Coal bed, Roundup; Tertiary age, Fort Union formation. The bed averages about 5 feet 8 inches thick and has no persistent partings. Roof and floor are shaly sandstone. The bed was sampled by C. T. Lupton on July 21, 1913. The sample was taken from a point about 3,000 feet west from the mouth of the entry, in 2 room, 7 west entry, and represented the whole thickness of the bed.

For geologic relations of this coal, see U. S. Geol. Survey Bull. 381, 1908, pp. 60–81.

ROUNDUP. NO. 4 MINE.

Analysis 17587 (p. 59). Subbituminous coal, Bull Mountain field, from No. 4 mine, in SE. ¼ sec. 17, T. 8 N., R. 26 E., about 3 miles southeast of Roundup, on a spur of the Chicago, Milwaukee & St. Paul Ry. Coal bed, Roundup; Tertiary age, Fort Union formation. The bed averages 3 feet 6 inches thick. Roof, sandstone; floor, shaly sandstone. The bed was sampled by C. T. Lupton on July 21, 1913 as described on page following.

Section of coal bed in No. 4 mine.

	Ft.	in.
Roof, sandstone.		
Coal		2
Bone		[a] 2
Coal	3	2
Floor, shaly sandstone.		
Thickness of bed	3	6
Thickness of coal sampled	3	4

[a] Not included in sample.

Sample 17587 was taken from a point about 3,000 feet S. 5° W. of the mouth of the mine.

For geologic relations of this coal, see U. S. Geol. Survey Bull.647, 1917, pp. 38–39.

SHERIDAN COUNTY.

Daleview. Ranous Mine.

Analysis 23008 (p. 59). Lignite, Plentywood field, from Ranous mine, in sec. 36, T. 37 N., R. 51 E., at Daleview, a town on the Soo Line. Lignite bed, Daleview; Tertiary age, Fort Union formation. Roof, not seen; floor, shale. The bed was sampled September 26, 1915, by W. T. Thom, jr. The sample represented 4 feet 11 inches of lignite. Above the lignite was a ¾-inch bed of brown clay, and above that was more lignite. The sample was taken at the face of the main entry, 400 feet N. 45° E. of mine mouth.

East Scobey. Coal Creek Mine.

Analysis 23007 (p. 59). Lignite, Plentywood field, from Coal Creek mine, in sec. 16, T. 37 N., R. 45 E., about 25 miles northwest of East Scobey, a town on a branch of the Great Northern Ry. Lignite bed, Coal Creek; Tertiary age, Fort Union formation. Roof, sandstone; floor, clay. The bed was sampled August 4, 1915, by A. J. Collier and Raymond Baker, as shown below:

Section of lignite bed in Coal Creek mine.

	Ft.	in.
Roof, sandstone.		
Lignite	[a] 1	1
Clay		[a] 1
Lignite		[a] 2
Clay, black	[a] 3	1
Lignite		[a] 8
Bone		[a] 1
Lignite	[a] 4	8
Clay	[a] 1	0
Lignite	[a] 3	1
Bone		[a] 4
Lignite		[a] 10
Clay		[a] ½
Lignite	3	1
Bone		[a] 2½
Lignite	3	1
Floor, clay.		
Thickness of bed	21	6
Thickness of lignite sampled	6	2

[a] Not included in sample.

The sample was taken in a small drift, 20 feet back of the face; it was weathered.

Plentywood. Pierce Bros. Mine.

Analysis 23595 (p. 60). Lignite, Plentywood field, from Pierce Bros. mine, in sec. 9, T. 35 N., R. 55 E., about 1½ miles northeast of Plentywood, a town on a branch of the Great Northern Ry. Lignite bed, Richardson; Tertiary age, Fort Union formation. Roof and floor, shale. The bed was sampled October 13, 1915, by A. J. Collier, as shown on page following.

Section of lignite bed in Pierce Bros. mine.

	Ft.	in.
Roof, shale.		
Lignite	[a]1	9
Clay	[a]1	2
Lignite		[a]1½
Clay		[a]9
Lignite	[a]2	2
Lignite, impure	[a]1	10
Lignite	3	6
Floor, shale.		
Thickness of bed	11	3½
Thickness of lignite sampled	3	6

[a] Not included in sample.

The sample was taken at a point 100 feet east of the mine mouth.

For geologic relations of this lignite see U. S. Geol. Survey Bull. 541, 1914, pp. 293-315.

VALLEY COUNTY.

East Scobey. Fisher Mine.

Analysis 23005 (p. 60). Lignite, Plentywood field, from Fisher mine, in sec. 36, T. 37 N., R. 42 E., about 36 miles west-northwest of East Scobey. Lignite bed, not named; Tertiary age, Fort Union formation. The bed was sampled August 23, 1915, by W. T. Thom, jr., as shown below:

Section of lignite bed in Fisher mine.

	Ft.	in.
Roof, clay.		
Lignite, impure		[a]9
Lignite	2	6
Clay		[a]2
Lignite	2	6
Floor, clay.		
Thickness of bed	5	11
Thickness of lignite sampled	5	0

[a] Not included in sample.

The sample, which was weathered, was taken at the face of a drift 6 feet north of face of old open pit.

Opheim. Baldwin Bros. Mine.

Analysis 23006 (p. 60). Lignite, Plentywood field, from Baldwin Bros. mine, in sec. 7, T. 36 N., R. 40 E., about 7 miles northwest of Opheim and 65 miles north of Glasgow. Lignite bed, Opheim; Tertiary age, Fort Union formation. Roof and floor, shale. The bed was sampled August 19, 1915, by W. T. Thom, jr., as shown below:

Section of lignite bed in Baldwin Bros. mine.

	Ft.	in.
Roof, shale.		
Lignite	[a]1	10
Bone		[a]2
Shale		[a]3
Lignite		5
Lignite, woody	1	6
Shale		[a]1½
Lignite	1	6
Floor, shale.		
Thickness of bed	5	9½
Thickness of lignite sampled	3	5

[a] Not included in sample.

The sample was taken at face of main entry, 150 feet southwest of mine mouth.

Opheim. Dawson Mine.

Analysis 23025 (p. 60). Lignite, Plentywood field, from Dawson mine, in sec. 6, T. 36 N., R. 40 E, about 8 miles northwest of Opheim and 66 miles north of Glasgow. Lignite bed, not named; Tertiary age, Fort Union formation. Roof and floor, shale. The bed was sampled August 15, 1915, by W. T. Thom, jr., as shown on page following.

Section of lignite bed in Dawson mine.

	Ft.	in.
Roof, shale.		
Lignite		[a] 1 5
Shale		[a] 3½
Lignite	2	1¼
Shale, brown		[a] ¼
Lignite	2	2
Floor, shale.		
Thickness of bed	6	0
Thickness of lignite sampled	4	3½

[a] Not included in sample.

The sample was taken at face of main entry 120 feet east of mine mouth.

NEW MEXICO.

COLFAX COUNTY.

BRILLIANT. BRILLIANT MINE.

Analysis 17703 (p. 60). Bituminous coal, Raton field, from Brilliant mine, a drift mine in T. 31 N., R. 23 E., at Brilliant, on branch of Atchison, Topeka & Santa Fe Ry., leaving main line at Dillon south of Raton. Coal bed, Tin Pan; Tertiary (Eocene) age, Raton formation. It lies horizontal. Roof, shale or coal; floor, shale. The bed was sampled in 1 east entry, 5 main entry, south of Tin Pan Canyon, by W. T. Lee, on August 30, 1913, as described on page following.

Section of coal bed in Brilliant mine.

	Ft.	in.
Roof, shale.		
Coal		6
Shale		[a] 2
Coal		9
Shale		[a] 8
Coal	1	9
Coal, bony		[a] ½
Coal	1	2
Shale		[a] 2
Coal		8
Floor, shale.		
Thickness of bed	5	10½
Bed sampled	4	10

[a] Not included in sample.

Daily output at time of sampling, 600 tons.

DAWSON. DAWSON NO. 2 MINE.

Analyses 18166, 18169, 18171, 18174, 18175, and 18279 (pp. 60-61). Bituminous (coking) coal, Raton field, from Dawson No. 2 mine, a drift mine at Dawson. The Dawson mines are in sec. 1, T. 27 N., R. 20 E.; sec. 31, T. 28 N., R. 21 E; sec. 36, T. 28 N., R. 20 E., at Dawson on the El Paso & Southwestern R. R. Coal bed, "Raton"; Cretaceous age, Vermejo formation. Average thickness of coal worked, 6 feet; dip, 1° NW.; cleat, east and west. Roof, sandstone; floor, usually smooth clay and shale. Cover at points of sampling, 200 to 400 feet. The bed was sampled by J. C. Roberts on November 8, 1913, as described on page following.

Sections of coal bed in Dawson No. 2 mine.

Section	A	B	C	D	E
Laboratory No.	18166	18169	18171	18174	17175
Roof, sandstone over bony coal.					
Coal	1 11	5	1 6	.. ..	.. ..
"Sulphur" band	a ½	a ½	a 1½	.. ..	.. ..
Coal	1 4½	1 0	1 0	7	4½
Parting	a ½	a ½	a 1	a 1	a 3½
Coal	2 4	3 10	3 3	6 3	4 2
Floor, bone to shale.					
Thickness of bed	5 8½	5 4	5 11½	6 11	4 10
Thickness of coal sampled	5 7½	5 3	5 9	6 10	4 6½

a Not included in sample.

Section A (sample 18166) was cut from face of 16 east entry, 1 and 2 north entries. Section B (sample 18169) was cut from face of 35 room, 12 west entry, 1 and 2 north entries. Section C (sample 18171) was cut from face of 5 room, 1 south entry, 4 east entry, "Hi" line. Section D (sample 18174) was cut from face of 13 east entry, "Hi" line. Section E (sample 18175) was cut from face of 1 east entry, 1 south entry, 9 west entry, 1 and 2 north entries.

The ultimate analysis of a composite sample made by combining face samples 18166, 18169, 18171, 18174, and 18175 is given under laboratory No. 18279.

The mine is worked on the room-and-pillar system. In 1913 the coal was screened and the screenings coked. Undercutting was largely by semilongwall machine but there was considerable hand pick work. The coal was blasted with a permissible explosive; dynamite was used for brushing the roof and floor. Average daily output, 1,500 tons; capacity, 3,000 tons a day.

For descriptions and analyses of other samples of coal from this mine, see Bureau of Mines Bull. 22, 1913, pp. 137, 640, and Bull. 85, 1914, pp. 57, 235.

Koehler. Koehler No. 3 Mine.

Analysis 17781 (p. 61). Bituminous coal, Raton field, from Koehler No. 3 mine, a drift mine, north of canyon, at Koehler, on the Atchison, Topeka & Santa Fe Ry. Coal bed, Raton; Cretaceous (Montana) age, Vremejo formation. The bed lies horizontal; its roof is shale, sandstone, or conglomerate; its floor is bony coal. The bed was sampled in 71 room, 2 east entry, by W. T. Lee, on September 25, 1913, as shown below:

Section of coal bed in Koehler No. 3 mine.

	Ft.	in.
Roof, shale.		
Coal		10
Coal, bony		4
Coal		6
Bone		a 1
Coal	1	5
Bone		a ½
Coal	1	1
Bone	a 1	4
Coal		9
Bone		a 1
Coal	3	2
Floor, bony coal.		
Thickness mined	9	7½
Thickness of coal sampled	8	1

a Not included in sample.

Daily output of mine in September, 1913, 1,800 tons.

YANKEE. YANKEE MINE.

Analysis 17746 (p. 61). Bituminous coal, Raton field, from Yankee mine, a drift mine in sec. 35, T. 32 N., R. 62 W., at Yankee, on the Atchison, Topeka & Santa Fe Ry. Coal bed, "Yankee"; Tertiary (Eocene) age, Raton formation. Bed lies horizontal; roof and floor are shale. The bed was sampled September 18, 1913, by W. T. Lee, as follows:

Section of coal bed in Yankee mine.

	Ft.	in.
Roof, shale.		
Coal		7
Shale		[a] 11
Coal	1	7
Shale	[a] 1	1
Coal	1	9
Floor, shale.		
Thickness of bed	5	11
Thickness of coal sampled	3	11

[a] Not included in sample.

The sample was cut in the mine, 570 feet N. 20° E. from the mine mouth.

McKINLEY COUNTY.

ALLISON. DIAMOND MINE.

Analyses 19217 to 19220 (p. 61). Subbituminous coal, Gallup field, from Diamond mine, a shaft mine in SE. ¼ SW. ¼ sec. 18, T. 15 N., R. 18 W., at Allison, about 1 mile north of the Atchison, Topeka & Santa Fe Ry., on a spur. Coal bed, Aztec (?); Upper Cretaceous age, Mesaverde formation. Roof, bone and coal, 1 foot thick; floor, sandstone. Bed lies nearly flat, with slight dips both south and north. The bed was sampled by C. T. Lupton on April 14, 1914, as described below:

Section of coal bed in Diamond mine.

Section	A	B	C
Laboratory No	19217	19218	19219
Roof, bone and coal.	Ft. in.	Ft. in.	Ft. in.
Coal	1 4	1 0	11
Bone	[a] ½	[a] 3	[a] ¾
Coal, bony	.. ..	[a] 6	.. ..
Coal	2 8½	7½	3 9
Bone	.. ..	[a] ½	[a] 3½
Coal	.. ..	11	2 2½
Coal, bony	.. ..	[a] 4	.. ..
Coal	.. ..	2 3	.. ..
Floor, sandstone.			
Thickness of bed	4 1	5 11	7 2¾
Thickness of coal sampled	4 ½	4 9½	6 10½

[a] Not included in sample.

Section A (sample 19217) was gathered about 2,600 feet N. 55° W. of shaft. Section B (sample 19218) was gathered about 1,400 feet S. 85° W. of shaft. Section C (sample 19219) was gathered about 3,300 feet N. 45° E. of shaft.

The ultimate analysis of a composite sample made by combining face samples 19217, 19218, and 19219 is given under No. 19220.

GALLUP. BARTLETT MINE.

Analysis 19136 (p. 61). Subbituminous coal, Gallup field, from Bartlett mine, a shaft mine in NW. ¼ NE. ¼ sec. 9, T. 15 N., R. 18 W., about 1½ miles north of Gallup, on a spur of the Atchison, Topeka & Santa Fe Ry. Coal bed, Black Diamond (?); Upper Cretaceous age, Mesaverde formation. Thickness, 6 feet; dip, 11° W.; roof, shale;

floor, shale. The bed was sampled by C. T. Lupton on April 8, 1914, about 430 feet south of shaft, as described below:

Section of coal bed in Bartlett mine.

	Ft.	in.
Roof, shale.		
Coal	2	3
Sandstone	[a]	1½
Coal	1	8
Bone	[a]	2
Coal	1	9
Floor, shale.		
Thickness of bed	5	11½
Thickness of coal sampled	5	8

[a] Not included in sample.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, p. 409.

GALLUP. BEDDOW MINE.

Analysis 19222 (p. 61). Subbituminous coal, Gallup field, from Beddow mine, a shaft mine in SE. ¼ SW. ¼, sec. 8, T. 15 N., R. 18 W., about 1½ miles northwest of Gallup station on the Atchison, Topeka & Sante Fe Ry. Coal bed, Aztec (?); Upper Cretaceous age, Mesaverde formation. Average thickness, 3½ to 4 feet; dip, 2° E. Roof, sandstone; floor, shale. The bed was sampled at a point about 300 feet west of shaft by C. T. Lupton on April 14, 1914. The sample represented 3 feet 10½ inches of coal, the thickness of the bed.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1917, p. 409.

GALLUP. CARRETO MINE.

Analysis 19163 (p. 61). Subbituminous coal, Gallup field, from Carreto mine, in SE. ¼ SW. ¼ sec. 14, T. 15 N., R. 18 W., a slope mine about 1¼ miles east of Gallup on the Atchison, Topeka & Sante Fe Ry. Coal bed, Otero (?); Upper Cretaceous age, Mesaverde formation. Thickness, 3½ to 4 feet. Roof, sandstone; floor, shale. The bed was sampled at a point about 350 feet S. 15° E. of mouth of entry by C. T. Lupton on April 10, 1914, as described below:

Section of coal bed in Carreto mine.

	Ft.	in.
Roof, sandstone.		
Coal	[a]	4
Shale	[a]	3
Coal	3	2
Floor, shale.		
Thickness of bed	3	9
Thickness of coal sampled	3	2

[a] Not included in sample.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, p. 409.

GALLUP. DEFIANCE MINE.

Analysis 19223 (p. 61). Subbituminous coal, Gallup field, from the Defiance mine, in SW. ¼ NE. ¼, sec. 16, T. 15 N., R. 19 W., 6 miles west of Gallup and about 2 miles north of Atchison, Topeka & Santa Fe Ry. Coal bed, Defiance; Upper Cretaceous age, Mesaverde formation. Thickness, 5½ to 6 feet; dip, 4° E. Roof, sandstone; floor, shale. The bed was sampled at a point about 830 feet N. 85° E. of the mine mouth by C. T. Lupton on April 11, 1914. The sample represented 5 feet 9½ inches of coal, the thickness of the bed.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, p. 409.

GALLUP. GALLUP SOUTHWESTERN MINE.

Analysis 19162 (p. 61). Subbituminous coal, Gallup field, from Gallup Southwestern mine in NE. ¼ SE. ¼ sec. 21, T. 15 N., R. 18 W., about 1 mile south of Gallup and on a spur of the Atchison, Topeka & Santa Fe Ry. Coal bed, Black Diamond; Upper Cretaceous age, Mesaverde formation. Thickness, 5½ feet; dip, 20° W.; roof sandstone; floor, shale. The bed was sampled at a point in the mine about 1,200 feet south of the mine mouth on April 10, 1914, by C. T. Lupton as described below:

Section of coal bed in Gallup Southwestern mine.

	Ft.	in.
Roof, sandstone.		
Coal		[a] 2
Bone		[a] 2
Coal		10
Bone		[a] 1½
Sandstone		[a] 2
Coal	3	11
Floor, shale.		
Thickness of bed	5	4½
Thickness of coal sampled	4	9

[a] Not included in sample.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1917, p. 413.

GALLUP. HEATON MINE.

Analyses 19286, 19287, and 19288 (p. 61). Subbituminous coal, Gallup field, from Heaton mine, a slope mine in NW. ¼ sec. 35, T. 16 N., R. 18 W., about 4 miles northeast of Gallup, on the Atchison, Topeka & Santa Fe Ry. Coal beds, Nos. 2, 3, and 3½; Upper Cretaceous age, Mesaverde formation; thickness of each 3 to 4 feet; dip, 2° N. Roof, shale; floor, shale. Cleat runs east and west; faults are frequent. Each of these beds were measured and sampled in one place in the mine by C. T. Lupton on April 23, 1914, as described below:

Section of No. 3 coal bed in Heaton mine.

Laboratory No	19288	
Roof, hard blue shale.	Ft.	in.
Coal, bony		[a] 7
Coal	2	4
Coal, bony		[a] 8
Coal		5
Floor, smooth shale.		
Thickness of bed	4	0
Thickness of coal sampled	2	9

[a] Not included in sample.

Sample 19288 was cut 4,000 feet N. 37° W. of the slope mouth. Sample 19286 was cut in No. 2 bed, about 2,300 feet N. 30° W. of slope mouth, and represented 2 feet 11 inches of coal, the thickness of the bed. Sample 19287 was cut in No. 3½ bed, 3,300 feet N. 15° W. of slope mouth, and represented 3 feet 11 inches of coal, the thickness of the bed.

Room-and-pillar system of mining. In 1914 black blasting powder was used to shoot down the coal. About 50 per cent of the coal was taken out in advance work, with a total recovery of 75 per cent. Daily output 600 tons.

For geologic relations of these coal beds see U. S. Geol. Survey Bull. 316, 1907, p. 413.

GALLUP. JONES MINE.

Analysis 19221 (p. 61). Subbituminous coal, Gallup field, from Jones mine, in SW. ¼ NW. ¼, sec. 22, T. 15 N., R. 19 W., about 7 miles southwest of Gallup and 1 mile

north of the Atchison, Topeka & Santa Fe Ry. Coal bed, Defiance; Upper Cretaceous age, Mesaverde formation. Thickness, 2½ feet. Roof, shale; floor, shale. The bed was sampled at a point about 250 feet north of the mine mouth by C. T. Lupton on April 11, 1914. The sample represented 2 feet 6 inches of coal, the thickness of the bed, and was damp.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, p. 409.

GALLUP. MYERS MINE.

Analysis 19213 (p. 61). Subbituminous coal, Gallup field, from Myers mine, in SE. ¼ sec. 21, T. 15 N., R. 19 W., about 8 miles west of Gallup and 1 mile north of the Atchison, Topeka & Santa Fe Ry. Coal bed, Myers; Upper Cretaceous age, Mesaverde formation. Thickness, 2½ to 3 feet; dip, 3° NE. Roof, shale; floor, shale. The bed was sampled by C. T. Lupton on April 15, 1914, as described below:

Section of coal bed in Myers mine.

	Ft.	in.
Roof, shale.		
Coal, hard and bony		[a]3
Coal, slightly bony		2
Coal	2	4
Bone		[a]1
Floor, shale.		
Thickness of bed	2	10
Thickness of coal sampled	2	6

[a] Not included in sample.

The sample was cut in the mine about 205 feet N. 45° W. of the mine opening. Daily output of mine, 6 tons.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, p. 409.

GALLUP. NAVAJO MINE.

Analyses 19131 to 19135 (pp. 61, 62). Subbituminous coal, Gallup field, from Navajo mine, a slope mine in SW. ¼ SE. ¼ sec. 33, T. 16 N., R. 18 W., about 3 miles north of Gallup on a spur of the Atchison, Topeka & Santa Fe Ry. Coal beds, Nos. 1, 2, 3, and 5; Upper Cretaceous age, Mesaverde formation. There are many faults; no rolls or horsebacks. No. 1 bed is about 5½ feet thick, dips 2½° N., has a shale or sandstone roof, and is rather bony. No. 2 bed is about 4 feet thick, dips 7° N., has a sandstone roof and shale floor. No. 3 bed, 4 feet thick, is clean coal. No. 5 bed is 5½ to 7½ feet thick, dips 12° NW., and has a persistent 2-inch clay parting about 2 feet from top. Roof is a smooth "draw slate" 8 inches thick, which falls in rooms. There is a sandstone cap rock above the "draw slate." Floor is shale. No. 1 bed was sampled at one point, No. 2 bed at one point, and No. 5 bed at two points by C. T. Lupton on April 8, 1914, as described below:

Sections of No. 5 bed in Navajo mine.

Section	A		B	
Laboratory No.	19133		19134	
Roof, shale or sandstone.	Ft.	in.	Ft.	in.
Coal		11		--
Coal, bony	--	--	--	[a]5
Sandstone		[a]1½	--	--
Coal	6	3		[a]4
Coal, bony	--	--	[a]1	2
Coal	--	--	5	3½
Floor, shale.				
Thickness of bed	7	3½	7	2½
Thickness of coal sampled	7	2	5	3½

[a] Not included in sample.

Section A (sample 19133) was gathered about 2,500 feet N. 2° W. of mine mouth. Section B (sample 19134) was gathered about 1,300 feet north 55° west of mine mouth.

The ultimate analysis of a composite sample made by combining face samples 19133 and 19134 is given under laboratory No. 19135.

Section of No. 1 bed in Navajo mine.

Laboratory No.	19131
	Ft. *in.*
Roof, shale.	
Coal	1 8½
Shale	*a* ¾
Coal	1 8¾
Shale	*a* 1
Coal	2 2+
Floor, not exposed.	
Thickness of bed	5 9+
Thickness of coal sampled	5 7½+

a Not included in sample.

Sample 19131 was cut in No. 1 bed, about 1,400 feet N. 21° W. of mouth of old slope.

Section of No. 2 bed in Navajo mine.

Laboratory No.	19132
	Ft. *in.*
Roof, sandstone.	
Coal	1 8
Bone	*a* ¾
Coal	1 2
Bone	*a* ½
Coal	1 3½
Floor, shale.	
Thickness of bed	4 2¾
Thickness of coal sampled	4 1½

a Not included in sample.

Sample 19132 was cut in No. 2 bed, about 2,300 feet N. 21° W. of mouth of old slope.

The room-and-pillar block system of mining is used. The coal was shot down with black powder. About 50 per cent of the coal was taken out in advance work. A total recovery of 70 to 75 per cent was made. At the time of sampling the output was 800 tons a day.

For geologic relations of these coals see U. S. Geol. Survey Bull. 316, 1907, p. 409.

Gibson. Weaver Mine.

Analyses 19137 to 19140 (p. 62). Subbituminous coal, Gallup field, from Weaver mine, a slope mine in SW. ¼ NE. ¼ sec. 34, T. 16 N., R. 18 W., at Gibson, 3 miles north of Gallup and on a branch of the Atchison, Topeka & Santa Fe Ry. Four coal beds are mined; Upper Cretaceous age, Mesaverde formation. No. 2 bed, 3½ feet thick, dip 11° N., has sandstone roof and shale floor. No. 3 bed, 5 feet thick, has sandstone roof and shale floor. No. 3½ bed, 5 feet thick, dip 7° N., has sandstone roof and shale floor. No. 5 bed is 6 feet thick, dips 5° N., and has an east-west cleat. Faults are frequent. There are no rolls or horsebacks. Roof, smooth "draw slate;" floor, soft, rough clay. Each bed was sampled at one point by C. T. Lupton on April 7, 1914, as described below:

Section of No. 3½ bed in Weaver mine.

Laboratory No.	19139
	Ft. *in.*
Roof, sandstone.	
Coal, bony	11
Coal	7
Bone	*a* 6
Coal	3 8
Floor, shale.	
Thickness of bed	5 8
Thickness of coal sampled	5 2

a Not included in sample.

Sample 19139 was cut in the mine about 2,750 feet N. 2° W. of mine mouth. Sample 19137 was cut in No. 2 bed, about 3,900 feet N. 6° W. of mine mouth, and represented 3 feet 8 inches of coal, entire thickness of bed. Sample 19138 was cut in No. 3 bed, about 3,450 feet N. 12° W. of mine mouth, and represented 4 feet 11 inches of coal, entire thickness of bed. Sample 19140 was cut in No. 5 bed, about 2,800 feet N. 42° W. of mine mouth, and represented 5 feet 2 inches of coal, the lower part of the bed, which was 6 feet ½ inch thick. The upper 10½ inches, which was bone and bony coal, was not included in the sample.

The room-and-pillar system of mining is used. In 1914 the coal was shot down with black blasting powder. About 50 per cent of the coal was taken in advance work, and a total recovery of about 75 per cent was made. Daily production averaged 1,050 tons.

For analyses and descriptions of other samples of coal from this mine, see Bureau of Mines Bull. 22, 1913, pp. 140, 648.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, p. 412.

SAN JUAN COUNTY.

Durango (Colo). New Mexico Mine.

Analysis 17749 (p. 62). Bituminous coal, San Juan field, from New Mexico mine, in sec. 22, T. 32 N., R. 12 W., about 16 miles south of the Rio Grande & Southern R. R., 13 miles west of the Denver & Rio Grande R. R., and about 28½ miles southwest of Durango, Colo. Coal bed known as "A;" Cretaceous age, "Laramie" formation. Dip, about 8° SE. Roof and floor, shale; cover, 25 feet. The bed was sampled in the mine about 75 feet east of opening, August 5, 1913, by M. A. Pishel, as described below:

Section of coal bed in New Mexico mine.

	Ft.	in.
Roof, shale.		
Coal, bony	4	9
Shale		[a] 2
Coal	2	1
Floor, shale.		
Thickness of bed	7	0
Thickness of coal sampled	6	10

[a] Not included in sample.

Farmington. Government Mine.

Analysis 17750 (p. 62). Bituminous coal, San Juan field, from Government mine, in sec. 21, T. 30 N., R. 16 W., about 20 miles northwest of Farmington, a station on the Denver & Rio Grande R. R. Coal bed, Hogback; Upper Cretaceous age, Mesaverde formation. Thickness, 6 feet 3 inches; dip, 13½° SE. Roof is compact, cherty shale; floor is shale. Cover at point of sampling, 25 feet. The bed was sampled at a point in the mine about 100 feet southeast of the south opening by M. A. Pishel on August 22, 1913. The sample represented 6 feet 3 inches of coal, the thickness of the bed.

Analysis 22807 (p. 63). Subbituminous coal, San Juan field, from prospect pit in sec. 31, T. 24 N., R. 13 W., about 30 miles south of Farmington. Coal bed, Carbonero (?); Cretaceous age, Fruitland formation. The bed was sampled August 23, 1915, by C. M. Bauer as described on page following.

FARMINGTON. PROSPECT.

Section of coal bed at prospect, 30 miles south of Farmington.

	Ft.	in.
Roof, not noted.		
Coal	5	5
Parting	[a]	1
Coal	7	3
Floor, not noted.		
Thickness of bed	12	9
Thickness of coal sampled	12	8

[a] Not included in sample.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, pp. 376–426.

FARMINGTON. LOCAL MINE.

Analysis 22685 (p. 63). Subbituminous coal, San Juan field, from local mine near Chaco River, about 35 miles southwest of Farmington. Coal bed, not named; Cretaceous age, Fruitland formation. The bed was sampled July 28, 1916, by C. M. Bauer, as described below:

Section of coal bed in open pit 35 miles southwest of Farmington.

	Ft.	in.
Roof, not noted.		
Coal	[a]	4
Sandstone	[a]	4
Coal	2	6
Floor, not noted.		
Thickness of bed	3	2
Thickness of coal sampled	2	6

[a] Not included in sample.

The sample, which was weathered, was taken from the wall of an open pit.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, pp. 376–426.

FARMINGTON. BLAKE MINE.

Analysis 23003 (p. 63). Subbituminous coal, San Juan field, from Blake mine, in T. 22 N., R. 13 W., about 50 miles south of Farmington. Coal bed not named; Cretaceous age, Mesaverde formation. The bed was sampled October 2, 1915, by C. M. Bauer, as described below:

Section of coal bed in Blake mine.

	Ft.	in.
Roof, not noted.		
Coal	1	7
Shale	[a] 1	1
Coal	1	5
Floor, not noted.		
Thickness of bed	4	1
Thickness of coal sampled	3	0

[a] Not included in sample.

The sample was taken 40 feet north of mine mouth.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, pp. 376–426.

FRUITLAND. BLACK DIAMOND MINE.

Analysis 22508 (p. 63). Subbituminous coal, San Juan field, from Black Diamond mine, in T. 29 N., R. 15 W., near Fruitland and about 10 miles west of Farmington, on the San Juan River. Coal bed, Carbonero; Cretaceous age, Fruitland formation. The bed was sampled June 25, 1915, by C. M. Bauer, as described on page following.

Section of coal bed in Black Diamond mine.

	Ft.	in.
Roof, not noted.		
Coal	2	0
Bone		[a] 2
Coal	4	9
Bone		[a] 3
Coal	2	6
Bone		[a] 3
Coal	5	6
Floor, not noted.		
Thickness of bed	15	5
Thickness of coal sampled	14	9

[a] Not included in sample.

The sample was taken 25 feet north of mine mouth.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, pp. 376–426.

FRUITLAND. HENDERICKSON MINE.

Analysis 22509 (p. 63). Subbituminous coal, San Juan field, from Henderickson mine, in T. 29 N., R. 15 W., near Fruitland and about 10 miles west of Farmington, on the San Juan River. Coal bed, Carbonero; Cretaceous age, Fruitland formation. The bed was sampled June 25, 1915, by C. M. Bauer, as described below:

Section of coal bed in Henderickson (open-pit) mine.

	Ft.	in.
Roof, not stated.		
Coal	6	8
Coal, bony		[a] 4
Coal	5	6
Floor, not stated.		
Thickness of bed	12	6
Thickness of coal sampled	12	2

[a] Not included in sample.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, pp. 376–426.

PUEBLO BONITA. PUEBLO BONITA MINE.

Analysis 23004 (p. 63). Subbituminous coal, San Juan field, from Pueblo Bonita mine, in sec. 14, T. 20 N., R. 11 W., near Pueblo Bonita and about 45 miles northeast of Gallup. Coal bed, not named; Cretaceous age, Mesaverde formation. The bed was sampled October 4, 1915, by C. M. Bauer, as described below:

Section of coal bed in Pueblo Bonita mine.

	Ft.	in.
Roof, not stated.		
Bone		[a] 2
Coal	2	8
Bone		[a] 6
Coal	1	7
Floor, not stated.		
Thickness of bed	4	11
Thickness of coal sampled	4	3

[a] Not included in sample.

The sample was taken 50 feet south of mine mouth.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, pp. 376–426.

For analyses and descriptions of other samples of coal from this mine, see Bureau of Mines Bull. 22, 1913, pp. 141, 651.

SOCORRO COUNTY.

MAGDALENA. PROSPECT.

Analysis 17602 (p. 63). Bituminous (probably coking) coal, Datil Mountain field, from abandoned prospect in sec. 18, T. 1 N., R. 5 W., 20 miles northwest of Magdalena. Coal bed, not named, probably Tertiary age. Bed is lenticular, dips about

10° E., and is 2½ to 3 feet thick. Roof and floor, shale. The bed was sampled by D. E. Winchester, July 28, 1913, as described below:

Section of coal bed in prospect, 20 miles northwest of Magdalena.

	Ft.	in
Roof, shale.		
Coal, bony		[a] 2
Coal		4½
Shale, carbonaceous		[a] 2
Coal		4
Shale		[a] ½
Coal	1	7
Floor, shale.		
Thickness of bed	2	7½
Thickness of coal sampled	2	3½

[a] Not included in sample.

The sample was cut in face of entry 30 feet from opening. The coal was slightly weathered.

MAGDALENA. PROSPECT.

Analysis 17728 (p. 63). Subbituminous coal, Datil Mountain field, from prospect, in SW. ¼ sec. 20, T. 3 N., R. 9 W., 65 miles northwest of Magdalena. Coal bed not named; Upper Cretaceous age, probably Mesaverde formation. Thickness, 3½ feet. Bed is lenticular and lies practically horizontal. Roof, sandstone; floor, shale. The bed was sampled at end of prospect, 8 feet from opening, by D. E. Winchester on September 5, 1913, as described below:

Section of coal bed in Magdalena prospect.

	Ft.	in.
Roof, sandstone.		
Coal		6
Coal, bony		[a] 2
Coal		6
Coal, bony		[a] 1½
Coal	2	3
Floor, shale.		
Thickness of bed	3	6½
Thickness of coal sampled	3	3

[a] Not included in sample.

MAGDALENA. PROSPECT.

Analysis 20007 (p. 63). Subbituminous coal, Datil Mountain field, from prospect, in sec. 8, T. 2 N., R. 6 W., 32 miles northwest of Magdalena. Coal bed not named; Upper Cretaceous age, Mancos (?) shale. Dip, 4° SW. Roof, sandstone; floor, shale. The bed was sampled at end of drift, 15 feet from opening, by D. E. Winchester on October 22, 1914, as described below:

Section of coal bed 32 miles northwest of Magdalena.

	Ft.	in.
Roof, sandstone.		
Shale, carbonaceous		[a] 1
Coal		[a] 9
Shale, brown		[a] 4
Coal	1	2
Shale		[a] 4
Coal	1	9
Floor, not stated.		
Thickness of bed	4	5
Thickness of coal sampled	2	11

[a] Not included in sample.

The sample was wet and weathered.

NORTH DAKOTA.

MORTON COUNTY.

ALMONT. RAMSLAND MINE.

Analysis 19786 (p. 63). Lignite, New Salem field, from Ramsland mine, an open-pit mine in NW. ¼ sec. 6, T. 137 N., R. 86 W., 5 miles southwest of Almont, a station on the Northern Pacific Ry. Lignite bed not named; Tertiary (Eocene) age, Fort Union formation. Bed dips north about 2 to 3 feet in 100. It was sampled by E. T. Hancock on August 24, 1914, as shown below:

Section of lignite bed in Ramsland mine.

	Ft.	in.
Roof, sandy shale.		
Lignite	3	11
Lignite	[a] 1	8
Shale, brown	[a]	4½
Lignite	[a]	10
Floor, sandy shale.		
Thickness of bed	6	9½
Thickness of lignite sampled	3	11

[a] Not included in sample.

The sample was taken from the south wall of the open pit.

LEITH. KOLBANK MINE.

Analysis 17537 (p. 63). Lignite, Cannonball River field, from Kolbank mine, a local mine in sec. 7, T. 133 N., R. 87 W., about 1½ miles southwest of Leith, which is on the Cannonball branch of the Chicago, Milwaukee & St. Paul Ry. Lignite bed, Haynes (?); Lower Tertiary age, Fort Union formation. Thickness at mine mouth 7 feet 9 inches. Only the lower part is mined, the upper 2 or 3 feet being left for roof. Floor is shale. The sample was cut by E. R. Lloyd on July 10, 1913, from first room east of main entry, 70 feet south of mine mouth, and represented the lower 4 feet 10 inches of the bed.

Lignite is mined chiefly for domestic use, but to some extent for steam production. At the time of sampling the output of the mine was about 10 tons a day.

For geologic relations of this lignite see U. S. Geol. Survey Bull. 541, 1914, pp. 256–258, 286, 287.

NEW SALEM. DAKOTA PRODUCTS MINE.

Analysis 20033 (p. 63). Lignite, New Salem field, from Dakota Products mine, a slope mine, in sec. 15, T. 139 N., R. 85 W., one-half mile northeast of New Salem, on spur of Northern Pacific Ry. Lignite bed not named; Tertiary (Eocene) age, Fort Union formation. Thickness, 4½ to 6 feet in different parts of the mine; position nearly flat. Roof, sandstone; floor, shale. The bed was sampled by E. T. Hancock on October 23, 1914, as shown below:

Section of lignite bed in Dakota Products mine.

	Ft.	in.
Lignite left up for roof	(a)	
Lignite	1	4
Lignite, shaly		4
Lignite	3	1
Floor, shale.		
Thickness of lignite sampled	4	9

[a] Not measured.

The sample was taken from the face of a drift about 2,040 feet northwest of the opening. The lignite was mined chiefly for local use.

NEW SALEM. LOCAL MINE.

Analysis 19801 (p. 63). Lignite, New Salem field, from mine in SW. ¼ sec. 32, T. 138 N., R. 84 W., 10 miles southeast of New Salem. Lignite bed, not named; Tertiary (Eocene) age, Fort Union formation. Roof, sandstone; floor, shale. Dip, flat. The bed was sampled September 7, 1914, by E. T. Hancock. It was 6 feet 8 inches thick at the point sampled. The sample was cut 70 feet N. 15° W. of shaft landing, from the lower 4 feet 2 inches of the bed where lignite was least weathered. The sample was wet.

WILLIAMS COUNTY.

WILLISTON. HUSEBYE-ELLITHORPE MINE.

Analyses 19917, 19918, 19370, 19371, and 19372 (pp. 63–64). Lignite, Williston field, from Husebye-Ellithorpe mine, a shaft and drift mine in sec. 17, T. 155 N., R. 100 W., 1½ miles east of Williston, one-fourth of a mile from the Great Northern Ry. Top lignite bed; Tertiary (Eocene) age, Fort Union formation. Average thickness, 10 feet. Position, flat. Roof, blue clay; floor, blue clay, hard and smooth. The bed was sampled in two places by J. C. Roberts on April 28, 1914, and in two places by J. W. Paul on September 2, 1914.

Sample 19917 represented a 7-foot cut of clean lignite and was taken in 3 room, 2 north entry. Sample 19918 represented a 7¼-foot cut of clean lignite and was taken in 1 room, 2 north entry. Sample 19370 represented a 7-foot cut of clean lignite and was taken at face of 2 west entry, 200 feet from shaft. Sample 19371 represented a 7½-foot cut of clean lignite and was taken in 1 room, 2 west entry, at face.

An ultimate analysis of a composite sample made by combining face samples 19370 and 19371 is given under laboratory No. 19372.

In 1914, this was a new mine. It was opened by a 60-foot shaft and a drift, and operated on the room-and-pillar system. Three to 4 feet of lignite was left for roof. The lignite was shot off the solid with black blasting powder. The lignite was forked in the mine and then screened over bars 10 feet long with openings 1, 2, and 4 inches wide. There was about 80 acres to be mined. The daily output was about 15 tons, with a capacity for 100 tons; the maximum averaged about 30 tons during the winter, supplying local demands.

For geologic relations of this lignite see U. S. Geol. Survey Bull. 531, 1913, pp. 91-157.

WILLISTON. U. S. RECLAMATION SERVICE MINE.

Analyses 19365 to 19367, 19921, and 19922 (p. 64). Lignite, Williston field, from U. S. Reclamation Service mine, a drift mine in SE. ¼ NE. ¼ sec. 7, T. 155 N., R. 100 W., 3 miles northeast of Williston, on the Great Northern Ry. Middle lignite bed; Tertiary age, Fort Union formation. The bed averages 6 to 8 feet thick, and lies practically flat. Roof, soapstone clay; floor, soft, smooth clay, inclined to heave in places. The bed was sampled at two points by J. C. Roberts on April 27, 1914, and at two points by J. W. Paul, on September 1, 1914.

Sample 19365 represented a 6-foot cut of lignite and was taken at face of 3 south room, main west entry. Sample 19366 represented a 7-foot cut of lignite and was taken at face of main west entry. Sample 19921 was cut at face of 3 north entry, main west entry. Sample 19922 was cut from left rib, main west entry, near 2 stub entry.

An ultimate analysis of a composite sample made by combining face samples 19365 and 19366 is given under laboratory No. 19367.

This mine is operated by the United States Reclamation Service, and the product is used in connection with irrigation service. The double-entry, room-and-pillar, and dummy-room system of mining is used. At the time of sampling, the lignite was shot off the solid with permissible explosives. The average output was 20 tons

per day, with a maximum output of 125 tons. There was about 1,200 acres yet to be mined. The coal was all crushed to 2½-inch size.

For analyses and descriptions of other samples of coal from this mine see Bureau of Mines Bull. 85, 1913, pp. 60, 245.

For geologic relations of this bed see U. S. Geol. Survey Bull. 531, 1913, p. 120.

OHIO.

BELMONT COUNTY.

ALLEDONIA. S. A. MOORE MINE.

Analysis 20238 (p. 64). Bituminous coal, Ohio field, from S. A. Moore mine, a drift mine in sec. 33, T. 5 N., R. 4 W., Washington Township, 1½ miles southwest of Alledonia, on the Ohio River & Western R. R. (narrow gage). Coal bed, Washington; Carboniferous (Permian ?) age, Washington formation. Roof and floor, shale. The bed shows the usual two benches separated by clay, the upper bench being the more important. The bed was sampled by D. D. Condit on November 26, 1914, as described below:

Section of coal bed in S. A. Moore mine.

	Ft.	in.
Roof, shale.		
Coal, bony		[a]3
Coal, bony in lower part	2	1
Clay		[a]8
Coal		11
Floor, shale.		
Thickness of bed	3	11
Thickness of coal sampled	3	0

[a] Not included in sample.

The sample was cut in the mine 50 feet east of the opening. It showed little evidence of weathering. At the time of sampling the mine was in about 50 feet from the opening.

The section represented the Washington coal under large areas. It is mined only a little because better coals are accessible in most places.

ALLEDONIA. SHIPMAN BROTHERS MINE.

Analysis 20237 (p. 64). Bituminous coal, Ohio field, from Shipman Brothers mine, a country drift mine in sec. 22, T. 5 N., R. 4 W., Washington Township, on the bank of Captina Creek, 1 mile north of Alledonia, on the Ohio River & Western R. R. (narrow gage). Coal bed, Meigs Creek (Sewickley); Carboniferous age, Monongahela formation. Thickness, 3½ to 4 feet. Roof, clay with irregular limestone layers; floor, shale. The bed was sampled by D. D. Condit on November 26, 1914, as described below:

Section of coal bed in Shipman Brothers mine.

	Ft.	in.
Roof, clay and limestone.		
Coal	2	1
Coal, bony cannel		2½
Coal		1½
Clay		[a]½
Coal	1	6
Floor, clay shale.		
Thickness of bed	3	11½
Thickness of coal sampled	3	11

[a] Not included in sample.

The sample was taken 40 feet west of the opening.

The mine had been extended about 40 feet from the pit mouth at the time of sampling. The sample showed little evidence of weathering. The roof is not secure and falls badly on weathering.

ALLEDONIA. STOFFEL MINE.

Analysis 20236 (p. 65). Bituminous coal, Ohio field, from Stoffel mine, a country bank on the Nathan Davis farm in sec. 27, T. 5 N., R. 4 W., Washington Township, 1 mile southwest of Alledonia, a station on the Ohio River & Western R. R. (narrow gage). Coal bed, Waynesburg; Carboniferous age, Monongahela formation. Thickness in this and neighboring mines about 2½ feet. Roof, shale; floor, shale. The bed was sampled by D. D. Condit on November 26, 1914. The sample was collected at a point 50 feet southwest of the mine mouth and represented 2 feet 5½ inches of coal. The section included 4 inches of bony coal at the top, which was excluded from the sample.

This coal of similar thickness underlies large areas. It has a high ash content but is a valuable source of local fuel.

BAILEYS MILLS. COCHRAN NO. 2 MINE.

Analyses 20187, 20188, and 20189 (p. 65). Bituminous coal, Ohio field, from Cochran No. 2 mine, a drift mine in sec. 31, T. 8 N., R. 6 W., at Baileys Mills, Warren Township, 3½ miles southwest of Barnesville, on the Baltimore & Ohio R. R. Coal bed, Pittsburgh; Carboniferous age, Monongahela formation. Bed is about 4 feet thick and dips east at an angle of less than 1°. Roof, shale; floor, clay. The coal was sampled by R. V. A. Mills on November 25, 1914, as described below:

Sections of coal bed in Cochran No. 2 mine.

Section	A	B
Laboratory No.	20187	20188
Roof, shale.	*Ft. in.*	*Ft. in.*
Coal	9	1 1
"Sulphur"	[a]1	[a]1
Coal	2 11	[b]2
Coal	.. ..	3
Bone	.. ..	1
Coal	.. ..	6
"Sulphur"	.. ..	¼
Coal	.. ..	2
Floor, clay.		
Thickness of bed	3 9	4 2½
Thickness of coal sampled	3 8	4 1½

[a] Not included in sample. [b] Some "sulphur."

Section A (sample 20187) was measured at face of main north entry, 1 mile north of mine mouth. Section B (sample 20188) was measured in 6 room, 15 west entry, three-fourths mile north of mine mouth.

The ultimate analysis of a composite sample made by mixing samples 20187 and 20188 is given under laboratory No. 20189.

A sandstone "roll" reduces the thickness of the coal in certain entries. The output is loaded into cars and shipped to Columbus and other points west.

BARNESVILLE. THOMAS DAVY MINE.

Analysis 20176 (p. 65). Bituminous coal, Ohio field, from Thomas Davy mine, a drift mine in sec. 20, T. 8 N., R. 6 W., Warren Township, 1 mile southwest of Barnesville near the Baltimore & Ohio R. R. Coal bed, Meigs Creek (Sewickley); Carboniferous age, Monongahela formation. Thickness fairly uniform, about 3½ feet in this mine, not including the roof coal, which is not minable. The bed was sampled by D. D. Condit on November 20, 1914, as described on page following.

Section of coal bed in Thomas Davy mine.

	Ft.	in.
Roof, clay.		
Coal, impure		[a]10
Clay	[a]1	2
Coal	3	2
Bone		[a]2
Floor, shale.		
Thickness of bed	5	4
Thickness of coal sampled	3	2

[a] Not included in sample.

The sample was taken 350 feet southwest of the mine mouth. The coal is mined at several points near Barnesville for the local market.

BOSTON (ATLAS POST OFFICE). GEORGE THOMAS MINE.

Analysis 20241 (p. 65). Bituminous coal, Ohio field, from George Thomas mine, a drift mine in sec. 14, T. 7 N., R. 6 W., Somerset Township, 2 miles east of Boston (Atlas p. o.) and 7 miles south of Barnesville, the nearest town on the Baltimore & Ohio R. R. Coal bed, Waynesburg; Carboniferous age, Monongahela formation. Thickness, about 3 feet. Roof, sandstone; floor, shale. The bed was sampled by D. D. Condit on November 24, 1914, as described below:

Section of coal bed in George Thomas mine.

	Ft.	in.
Roof, sandstone.		
Coal	1	0
"Sulphur"		[a]2
Coal		10
"Mother coal"		[a]1
Coal		11
Floor, shale.		
Thickness of bed	3	0
Thickness of coal sampled	2	9

[a] Not included in sample.

The sample was cut 200 feet south of the mine mouth.

HUNTER. MILHOAN MINE.

Analysis 20174 (p. 65). Bituminous coal, Ohio field, from Milhoan mine, a country bank mine in sec. 7, T. 7 N., R. 5 W., Goshen Township, 1½ miles northeast of Hunter and 5 miles south of Bethesda station on the Baltimore & Ohio R. R. Coal bed, Waynesburg; Carboniferous age, Monongahela formation. Thickness is fairly uniform; is about 3 feet in this mine, but varies considerably in near-by openings. Roof and floor are shale. The bed was sampled by D. D. Condit on November 21, 1914, as described below:

Section of coal bed in Milhoan mine.

	Ft.	in.
Roof, shale.		
Coal	2	1½
Bone		1½
Coal		11
Floor, shale.		
Thickness of bed	3	2
Thickness of coal sampled	3	2

The sample was collected at a point 50 feet south of the mine mouth.

The coal is tough and somewhat bony throughout; although without visible clay bands, it has the appearance of a high-ash coal, as is shown by the analysis.

HUNTER. PETER KEMP PROSPECT.

Analysis 20775 (p. 65). Bituminous coal, Ohio field, from prospect on Peter Kemp farm in sec. 1, T. 7 N., R. 5 W., Goshen Township, 2 miles east of Hunter and 5 miles southeast of Bethesda, on the Baltimore & Ohio R. R. Coal bed, Uniontown; Carboniferous age, Monongahela formation. Thickness variable; one or more shale partings vary in thickness and locally are more prominent than the coal. Roof and floor are clay. The bed was sampled by D. D. Condit on November 21, 1914, as described below:

Section of coal bed in Peter Kemp prospect.

	Ft.	in.
Roof, clay.		
Coal	2	6
Shale		[a] 1
Coal		3
Shale		[a] 5
Coal		7
Floor, clay.		
Thickness of bed	3	10
Thickness of coal sampled	3	4

[a] Not included in sample.

The sample was taken at a point 20 feet west of the opening, and was weathered.

SOMERTON. HOWARD BROWN MINE.

Analysis 20234 (p. 65). Bituminous coal, Ohio field, from Howard Brown mine, a drift mine in sec. 26, T. 6 N., R. 5 W., Wayne Township, 2 miles southeast of Somerton and 8 miles southeast of Barnesville, on the Baltimore & Ohio R. R. Coal bed, Waynesburg; Carboniferous age, Monongahela formation. Average thickness, about 2½ feet. Roof, shale; floor, shale. The bed was sampled by D. D. Condit on November 24, 1914, as described below:

Section of coal bed in Howard Brown mine.

	Ft.	in.
Roof, shale.		
Coal		6
"Sulphur"		[a] 1
Coal	1	0
"Mother coal"		[a] ½
Coal		11
Floor, clay shale.		
Thickness of bed	2	6½
Thickness of coal sampled	2	5

[a] Not included in sample.

The sample was cut 100 feet west of the mine mouth.

Although generally less than 3 feet thick and of high ash content, this coal is mined in a small way at numerous places for local use.

TEMPERANCEVILLE. JEFFERIES MINE.

Analysis 20230 (p. 65). Bituminous coal, Ohio field, from Jefferies mine at Temperanceville in sec. 33, T. 7 N., R. 6 W., Somerset Township, 4 miles south of Baileys Mills, a station on the Baltimore & Ohio R. R. Coal bed, Pittsburgh; Carboniferous age, Monongahela formation. Thickness fairly uniform, about 3¾ feet. Roof, shale; floor, clay. The bed was sampled by R. V. A. Mills on November 22, 1914, as described on page following.

Section of coal bed in Jefferies mine.

	Ft.	in.
Roof, shale.		
Coal		7½
"Mother coal" streak		*a* ½
Coal		4½
Bone		*a* ¾
Coal	1	7
"Sulphur"		*a* ¼
Coal	1	0
Floor, clay.		
Thickness of bed	3	8½
Thickness of coal sampled	3	7

a Not included in sample.

The sample was collected at a point 600 feet north of the mine mouth.

The thickness of the coal in this mine varies slightly, but in the vicinity the coal thins toward the south and is of little importance in the hills south of Temperanceville.

GUERNSEY COUNTY.

HARTFORD. ANDY SLOVAK MINE.

Analysis 20243 (p. 65). Bituminous coal, Ohio field, from Andy Slovak mine, a drift mine in sec. 11, T. 8 N., R. 9 W., Valley Township, at Waldhonding, 1 mile southeast of Hartford, on a spur of the Baltimore & Ohio R. R. Coal bed, Anderson (Bakerstown); Carboniferous age, Conemaugh formation. Average thickness, 1¾ feet. Roof, sandstone; floor, shale. The sample was cut by D. D. Condit on November 27, 1914, at a point 75 feet east of the mine mouth, and represented 1 foot 10 inches of coal, the thickness of the bed.

The coal is mined in a small way for local use. Its thickness is about the same under a considerable area, but it has been mined at few places.

HARTFORD. WALDHONDING NO. 2 MINE.

Analyses 20245, 20246, and 20247 (p. 65). Bituminous coal, Ohio field, from Waldhonding No. 2 mine, a shaft mine in sec. 11, T. 8 N., R. 9 W., Valley Township, 1 mile southeast of Hartford, on a spur of the Baltimore & Ohio R. R. Coal bed, Upper Freeport; Carboniferous age, Allegheny formation. Thickness, variable. Roof, shale; floor, clay. The bed was sampled by D. D. Condit on November 27, 1914, as described below:

Sections of coal bed in Waldhonding No. 2 mine.

Section	A		B	
Laboratory No.	20245		20246	
Roof, shale.	Ft.	in.	Ft.	in.
Coal		2	1	9
"Mother coal"		½		*a* ½
Coal		8	1	6
"Mother coal"		*a* ½		¼
Coal	2	0		4
"Mother coal"		*a* ½		*a* ½
Coal		7		9
"Mother coal"		¼	--	--
Coal		8	--	--
Clay		*a* ¾	--	--
Coal		6	--	--
Bone		*a* 1½		*a* 1
Coal	1	2		10
Floor, clay.				
Thickness of bed	6	¾	5	4½
Thickness of coal sampled	5	9½		2¼

a Not included in sample.

Section A (sample 20245) was measured at a point 600 feet southeast of the shaft. Section B (sample 20246) was measured at a point 3,400 feet northwest of the shaft.

The result of an ultimate analysis of a composite sample made by mixing samples 20245 and 20246 is given under laboratory No. 20247.

Lore City. Black Top Mine.

Analyses 20264, 20265, and 20266 (p. 65). Bituminous coal, Ohio field, from Black Top mine, a shaft mine in sec. 8, T. 1 N., R. 2 W., Richland Township, 1 mile west of Lore City, on a spur of the Baltimore & Ohio R. R. Coal bed, Upper Freeport; Carboniferous age, Allegheny formation. Thickness, variable. Roof, shale; floor, clay. The bed was sampled by D. D. Condit on November 28, 1914, as described below:

Sections of coal bed in Black Top mine.

Section	A	B
Laboratory No.	20264	20265
Roof, shale.		
Coal	Ft. 2 in. 6	Ft. 2 in. 3
Coal, bony	1½	2½
Coal	1 2½	1 7
Bone	[a] 2	[a] 2½
Coal	10	1 9
Floor, clay.		
Thickness of bed	4 10	6 0
Thickness of coal sampled	4 8	5 9½

[a] Not included in sample.

Section A (sample 20264) was measured in 23 east entry, main south entry, 6,200 feet south 15° east of shaft. Section B (sample 20265) was measured near end of main south entry, 7,300 feet south 12° west of shaft.

The ultimate analysis of a composite sample made by mixing samples 20264 and 20265 is given under laboratory No. 20266.

The upper band of bony coal was included in the sample because included in mining; the lower bony band is excluded in mining. The shaft is about 102 feet deep. The average daily output was reported to be 1,000 tons.

Quaker City. Samuel Sayre Mine.

Analysis 20178 (p. 65). Bituminous coal, Ohio field, from Samuel Sayre mine, a drift mine in sec. 21, T. 9 N., R. 7 W., Millwood Township, 1½ miles northwest of Quaker City station on the Baltimore & Ohio R. R. Coal bed, Pittsburgh; Carboniferous age, Monongahela formation. Thickness, about 4 feet. Roof, shale; floor, clay. The two characteristic shale partings in the lower part of the bed are persistent in this region. The other divisions are less uniform. The bed was sampled by D. D. Condit, on November 20, 1914, as described below:

Section of coal bed in Samuel Sayre mine.

	Ft.	in.
Roof, shale.		
Coal, bony	[a]	4
Coal		9
"Sulphur"	[a]	1
Coal	1	8
Shale	[a]	½
Coal		3½
Shale	[a]	½
Coal		11
Floor, clay.		
Thickness of bed	4	1½
Thickness of coal sampled	3	7½

[a] Not included in sample.

The sample was taken from a fairly dry room at a point 250 feet east of the mine mouth. The vertical cover is about 70 feet. This and other small mines in the neighborhood supplied the local demand.

SENECAVILLE. CLEVELAND MINE.

Analyses 20261, 20262, and 20263 (p. 66). Bituminous coal, Ohio field, from Cleveland mine, a shaft mine in sec. 21, T. 1 N., R. 2 W., Richland Township, ¼ mile southeast of Senecaville, on a branch of the Baltimore & Ohio R. R. Coal bed, Upper Freeport; Carboniferous age, Allegheny formation. Thickness, variable. Roof, shale or sandstone. A sandstone "roll" is found in the workings. Floor, clay. The bed was sampled by D. D. Condit on November 28, 1914, as described below:

Sections of coal bed in Cleveland mine.

Section	A	B
Laboratory No.	20261	20262
Roof, shale on sandstone.	Ft. in.	Ft. in.
Coal	1 6	8
"Mother coal"	¼	½
Coal	8	1
Bone	a 1	-- --
Coal	7	-- --
"Mother coal"	¼	½
Coal	4	7
"Mother coal"	¼	-- --
Coal	8	-- --
Bone	a 2	a ¾
Coal	9	6
"Mother coal"	a ½	¼
Coal	4	8
"Mother coal"	a ½	¼
Coal	9	6
Bone	-- --	a 2
Coal	-- --	4
Bone	-- --	a 1
Coal	-- --	7
Floor, clay.		
Thickness of bed	5 11¾	5 3½
Thickness of coal sampled	5 7¾	4 11½

a Not included in sample.

Section A (sample 20261) was measured in 5 room, east entry, main north entry, 5,000 feet east of the shaft. Section B (sample 20262) was measured in 3 north entry, 10,500 feet north of the shaft.

The ultimate analysis of a composite sample made by mixing samples 20261 and 20262 is given under laboratory No. 20263.

MONROE COUNTY.

COATS STATION. CHARLES MOBLEY MINE.

Analysis 20259 (p. 66). Bituminous coal, Ohio field, from a small opening on the Charles Mobley farm in sec. 31, T. 4 N., R. 4 W., Adams Township, 2½ miles east from Coats station, the nearest station on the Ohio River & Western R. R. (narrow gage). Coal bed, Uniontown; Carboniferous age, Monongahela formation. Roof and floor are shale. The bed was sampled by D. D. Condit on November 27, 1914, as described below:

Section of coal bed in Charles Mobley mine.

	Ft.	in.
Roof, shale.		
Coal, bony at top	1	7
Shale		a 3½
Coal		10½
Shale		a 2
Coal		6
Floor, clay shale.		
Thickness of bed	3	5
Thickness of coal sampled	2	11½

a Not included in sample.

The sample was collected at a point 40 feet east of the mine mouth. It was weathered and stained with iron. The section shows the characteristic clay bands and bony streaks of the Uniontown coal.

NOBLE COUNTY.

Mount Ephraim Station. Wiley Carter Mine.

Analysis 20235 (p. 66). Bituminous coal, Ohio field, from a small mine on the Wiley Carter farm in sec. 33, T. 8 N., R. 8 W., Seneca Township, 1 mile north of Mount Ephraim station, on the Ohio River & Western R. R. (narrow gage). Coal bed, Meigs Creek (Sewickley); Carboniferous age, Monongahela formation. The bed was sampled by D. D. Condit on November 26, 1914, as described below:

Section of coal bed in Wiley Carter mine.

	Ft.	in.
Roof, shale.		
Coal		11
"Mother coal"		[a] 3/4
Coal		10
"Mother coal"		[a] 1
Coal	1	4
Floor, shale.		
Thickness of bed	3	2 3/4
Thickness of coal sampled	3	1

[a] Not included in sample.

The sample was cut in a room 300 feet west of the mine mouth.

Quaker City. G. W. Griffin Mine.

Analysis 20185 (p. 66). Bituminous coal, Ohio field, from a country bank mine on the G. W. Griffin farm in sec. 11, T. 8 N., R. 7 W., Beaver Township, 3 miles southeast of Quaker City station, on the Baltimore & Ohio R. R. Coal bed, Meigs Creek (Sewickley); Carboniferous age, Monongahela formation. Roof and floor, shale. The bed was sampled by D. D. Condit on November 22, 1914, as described below:

Section of coal bed in G. W. Griffin mine.

	Ft.	in.
Roof, shale.		
Coal	2	5
Clay		[a] 2
Coal		2
Floor, shale.		
Thickness of bed	3	9
Thickness of coal sampled	3	7

[a] Not included in sample.

The sample was cut at a point 350 feet west of the mine mouth, where the cover is about 75 feet thick. The shale roof is not secure.

Steamtown. J. T. Moore Mine.

Analysis 20240 (p. 66). Bituminous coal, Ohio field, from a country bank mine on the J. T. Moore farm in sec. 11, T. 7 N., R. 8 W., Marion Township, 1 mile west of Steamtown station, on the Ohio River & Western R. R. (narrow gage). Coal bed, Meigs Creek (Sewickley), Carboniferous age, Monongahela formation. Roof clay, floor, shale. The bed was sampled by D. D. Condit on November 26, 1914. as described on page following.

Section of coal bed in J. T. Moore mine.

	Ft.	in.
Roof, clay.		
Coal		11
"Mother coal"		[a] ½
Coal	2	0
"Mother coal"		[a] 1
Coal	1	0
Floor, clay shale.		
Thickness of bed	4	½
Thickness of coal sampled	3	11

[a] Not included in sample.

The sample was cut at a point 480 feet south of the mine mouth, where the cover is about 80 feet thick.

OKLAHOMA.

CRAIG COUNTY.

BLUEJACKET. JAMES COATES MINE.

Analysis 20716 (p. 66). Bituminous coal, Oklahoma field, from James Coates mine, a drift mine in sec. 26, T. 27 N., R. 20 E., 4 miles west of Bluejacket station on the Missouri, Kansas & Texas Ry. Coal bed not named; Carboniferous (Allegheny) age, Cherokee formation. Roof, shaly sandstone; floor, clay. The sample was cut just off the east side of the main entry, 300 feet from mine mouth, on December 13, 1914, by C. D. Smith, and represented 3 feet 1 inch of coal, the thickness of the bed.

ESTELLA. WILLIAM BOOT STRIP PIT.

Analysis 20718 (p. 67). Bituminous coal, Oklahoma field, from William Boot strip pit in sec. 33, T. 26 N., R. 19 E., 1 mile east of Estella. No railroad connection. Coal bed, not named; Carboniferous (Allegheny) age, Cherokee formation. The sample was cut December 14, 1914, by C. D. Smith, from the face of the open pit and represented 2 feet of coal, the thickness of the bed.

VINITA. HELDEBRAND STRIP PIT.

Analysis 20717 (p. 67). Bituminous coal, Oklahoma field, from Heldebrand strip pit in sec. 13, T. 26 N., R. 19 E., 10 miles northwest of Vinita, a station on the Missouri, Kansas & Texas Ry. and the St. Louis & San Francisco R. R. Coal bed, not named; Carboniferous (Allegheny) age, Cherokee formation. Roof, shale and sandstone; floor, clay. The sample was cut in the face of the open pit December 14, 1914, by C. D. Smith, and represented 2 feet 3 inches of coal, the thickness of the bed.

WELCH. J. A. MILLS STRIP PIT.

Analysis 20715 (p. 67). Bituminous coal, Oklahoma field, from J. A. Mills strip pit in sec. 28, T. 28 N., R. 20 E., 4 miles west of Welch, a station on the Missouri, Kansas & Texas Ry. Coal bed, not named; Carboniferous (Allegheny) age, Cherokee formation. Roof, shale; floor clay. The sample was cut in face of open pit December 12, 1914, by C. D. Smith, and represented 2 feet 2 inches of coal, the thickness of the bed.

HASKELL COUNTY.

STIGLER. TURNER BROTHERS STRIP PIT.

Analysis 17646 (p. 67). Bituminous coal, McAlester field, from Turner Brothers strip pit, 1 mile northeast of Stigler. Coal bed known as Stigler; Carboniferous (Allegheny) age, McAlester shale. Thickness, 1 foot 10 inches. Cover, 8 feet gray shale;

floor, soft clay. The bed was sampled by J. J. Rutledge on August 18, 1913. The sample represented 1 foot 10 inches of coal, the thickness of the bed.

The coal is clean and bright and breaks along columnar joints. It is used locally for blacksmith coal.

LATIMER COUNTY.

ADAMSON. ADAMSON NO. 6 MINE.

Analyses 19852, 19853, and 19854 (p. 67). Bituminous coal, McAlester field, from Adamson No. 6 mine, a slope mine 3 miles east of Adamson at Drum station, on Wilburton Branch of the Missouri, Kansas & Texas Ry. Coal bed, Lower Hartshorne, or Lower Wilburton; Carboniferous (Allegheny) age, McAlester shale. Bed about 4 feet 4 inches thick; dips 37½° N. and NE. Roof, gray shale; floor, hard gray shale. The bed was sampled by J. J. Rutledge and Daniel Harrington on January 28, 1915.

Sample 19852 was cut at face of 2 west entry, 460 feet northeast of mine opening, and represented 4 feet of clean coal. There was 4 inches of bony coal below the part sampled. Sample 19853 was cut at face of 2 east entry, 400 feet northeast of mine opening, and represented 4 feet 4 inches of coal, the thickness of the bed.

The ultimate analysis of a composite sample made by combining face samples 19852 and 19853 is given under laboratory No. 19854.

The room-and-pillar system of mining is used. In 1915 the coal was shot off the solid with black blasting powder and permissible explosives. The output was about 200 tons per day, all of which was from advance workings. The coal is clean. The mine is naturally moist. Some shale comes down with the roof. All of the output was shipped as run-of-mine. There were four loading tracks with a capacity of 20 empty and 20 loaded cars. The mine is new, having been opened in July, 1914, and at the time of sampling 270 acres had not been mined.

For geologic relations of this bed see U. S. Geol. Survey Bull. 260, 1905, p. 382.

LE FLORE COUNTY.

WILLIAMS. WILLIAMS NO. 1 MINE.

Analyses 19673 to 19678 (p. 67). Semibituminous coal, McAlester field, from Williams No. 1 mine, a slope mine 1 mile west of Williams, on Midland R. R. Coal bed, Lower Hartshorne; Carboniferous (Allegheny) age; McAlester shale. Thickness, 2 feet 8 inches to 4 feet 8 inches; dip, 7° to 12° S. Roof, "draw slate" and sandstone; floor, hard shale. Cover, 80 to 200 feet. The bed was sampled by J. W. Koster and J. R. Fleming on July 7, 1914, as described below:

Sections of coal bed in Williams No. 1 mine.

Section	A	B	C	D	E
Laboratory No	19673	19674	19675	19676	19677
Roof, sandstone or shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
"Draw slate"	a 2	a 1¾	a 4½	a 1⅜	1
Coal, bony	.. ..	.. ..	.. ..	⅜	.. ..
Coal	1 7½	11	1 1	6¾	1 0
"Mother coal" and "sulphur"	.. ..	Streak.	½	.. ..	.. ..
"Sulhur"	¼	.. ..	.. ..	Streak.	Streak.
Coal	1 3¾	10	1 ½	1 9	11½
"Sulphur"	.. ..	Streak.	¼	Streak.	Streak.
Coal	.. ..	6	2	1¼	5
"Sulphur" band	.. ..	¼	a 1	⅜	¼
Coal	.. ..	1 4½	1 6¾	1 4¾	3
"Sulphur" ball	.. ..	.. ..	.. ..	.. ..	4
Coal	.. ..	.. ..	.. ..	.. ..	5
Coal, bony	.. ..	a 4	.. ..	.. ..	.. ..
Floor, shale.					
Thickness of bed	3 1	4 1½	4 4½	4 0	3 5¾
Thickness of coal sampled	2 11	3 11¾	3 11	3 10⅜	2 ¾

a Not included in sample.

Section A (sample 19673) was cut at face of 2 room, main slope entry, 1,500 feet southeast of entrance. Section B (sample 19674) was cut at face of 25 room, 6 west entry, 1,500 feet south of entrance. Section C (sample 19675) was cut at face of 2 room, 5 east entry, 1,100 feet southeast of entrance. Section D (sample 19676) was cut at face of 35 room, 5 west entry, 1,500 feet southwest of entry. Section E (sample 19677) was cut at face of 7 room, 2 east entry, 250 feet from slope and 550 feet from drift mouth.

The ultimate analysis of a composite sample made by combining face samples 19673, 19674, 19675, 19676, and 19677 is given under laboratory No. 19678.

Room-and-pillar system of mining is used. In 1914 the coal was shot off the solid with black powder and dynamite. About half of the coal was shipped as run-of-mine and the rest was screened. There were two loading tracks, with capacity of 25 empty cars and 25 loaded cars. The output was about 250 tons per day, all from advance workings, in which about 90 per cent of the coal was taken out. The lifetime of the mine was probably 12 years. There were 80 acres still to be mined.

For geologic relations of this coal see U. S. Geol. Survey Bull. 260, 1905, p. 382.

PITTSBURG COUNTY.

ADAMSON. ADAMSON NO. 4 MINE.

Analyses 19855, 19856, and 19857 (p. 67). Bituminous coal, McAlester field, from Adamson No. 4 mine, a slope mine one-fourth mile south of Adamson on the Missouri, Kansas & Texas Ry. Coal bed, Lower Hartshorne; Carboniferous (Allegheny) age, McAlester shale. Average thickness, 4 feet; dip, 40° to 28° N. 3° W.; faint east-west cleat. Roof, blue shale; floor, smooth shale. The bed was sampled by J. R. Fleming on August 7, 1914, as described below:

Sections of coal bed in Adamson No. 4 mine.

Section	A	B	C
Laboratory No.	19855	19856	19857
Roof, shale.	*Ft.* *in.*	*Ft.* *in.*	*Ft.* *in.*
Coal, hard, bright	4 3	4 3	1 3½
Coal, bony	[a] 3½	.. ..	.. ..
"Mother coal" and "sulphur"	.. ..	.. ..	½
Coal, hard, bright	.. ..	.. ..	2 9
Floor, shale.			
Thickness of bed	4 6½	4 3	4 1
Thickness of coal sampled	4 3	4 3	4 1

[a] Not included in sample.

Section A (sample 19855) was cut at face of 9 east entry, 1,200 feet northeast of opening. Section B (sample 19856) was cut at face of 10 east entry, 1,250 feet northeast of opening. Section C (sample 19857) was cut at face of 10 west entry, 1,300 feet northwest of opening.

An ultimate analysis of a composite sample made by combining face samples 19855, 19856, and 19857 is given under laboratory No. 19858.

Room-and-pillar system of mining. In 1914 the coal was sheared in the entries and shot off the solid elsewhere, black powder being used in rooms and permissible explosives in entries. The coal is clean and was all screened, about half of it being lump over 2½ inches. The coal is naturally moist in new work. In advance work 50 per cent of the coal was taken out, and a total recovery of 60 per cent was made. Capacity of mine, 400 tons a day; actual average output, 350 tons. The probable lifetime of the mine was 10 to 15 years.

For geologic relations of this coal see U. S. Geol. Survey Bull. 260, 1905, p. 382.

Hartshorne. Rock Island No. 8 Mine.

Analyses 19703, 19707, and 19708 (p. 67). Bituminous coal, McAlester field, from Rock Island No. 8 mine, a shaft and slope mine in sec. 31, T. 5 N., R. 17 E., 1 mile northwest of Hartshorne, on the Chicago, Rock Island & Pacific R. R. Coal bed, Lower Hartshorne; Carboniferous (Allegheny) age, McAlester shale. Bed is 3 to 6 feet thick; dips 7° N. and W. Roof is dark gray, medium hard "draw slate;" floor is hard clay. The bed was sampled by W. T. Burgess and W. J. German on July 22, 1914, as described below:

Sections of coal bed in Rock Island No. 8 mine.

Section Laboratory No	A 19703	B 19707	C 19708
Roof, black shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	4 5	3 6	.. ..
Bottom coal	.. ..	.. ..	8¾
"Mother coal"	.. ..	.. ..	⅜
Coal	.. ..	.. ..	7¾
"Sulphur"	.. ..	.. ..	Streak.
Coal	.. ..	.. ..	1 4⅝
"Sulphur"	.. ..	½	Streak.
Coal	.. ..	5	8
"Mother coal" and "sulphur"	.. ..	⅛	¾
Coal	.. ..	8	3¾
Floor, clay.			
Thickness of bed	4 5	4 9½	3 10
Thickness of coal sampled	4 5	4 9½	3 10

Section A (sample 19703) was cut 1,800 feet northwest, section B (sample 19707) 2,000 feet northeast, and section C (sample 19708) 2,300 feet northeast of the shaft bottom.

The mine is opened by a shaft 256 feet deep and slopes. The slopes are each 2,000 feet long, starting from the shaft-bottom level. The room-and-pillar system of mining is used. In 1914 the coal was shot off the solid with dynamite, black powder, and permissible explosives by shot firers after the miners were out of mine. The coal is generally moist. In winter exhaust-steam jets are used to humidify the mine. The coal is fairly hard and bright, having regular partings and cleavage planes. The output was about 500 tons per day, 60 per cent of which was from advance workings; about 15 per cent from pillars.

For geologic relations of this coal see U. S. Geol. Survey Bull. 260, 1905, p. 382.

Pocahontas. Pocahontas No. 1 Mine.

Analyses 19727 to 19732 (p. 68). Bituminous coal, McAlester field, from Pocahontas No. 1 mine, a slope mine at Pocahontas, 3 miles west of Haileyville, on the Chicago, Rock Island & Pacific Ry. Coal bed, Lower Hartshorne; Carboniferous (Allegheny) age, McAlester shale. Bed is 3 feet to 3 feet 8 inches thick, and dips 12° to 20° S. 2° W. It is overlain with 15 feet of hard blue shale; the floor is hard, compact, smooth shale. The bed was sampled by J. R. Fleming on July 23, 1914, as described below:

Sections of coal bed in Pocahontas No. 1 mine.

Section Laboratory No	A 19727	B 19728	C 19729	D 19730	E 19731
Roof, hard blue shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft.* in.
Coal	3 4	.. ..	.. ..	.. ..	.. ..
Bone	.. ..	.. ..	[a] 3	.. ..	.. ..
Coal, hard, bright	.. ..	3 4½	3 6	3 0	3 3½
"Sulphur"	.. ..	.. ..	.. ..	[a] ¼	.. ..
Coal	.. ..	.. ..	.. ..	1 3¾	.. ..
Floor, smooth shale.					
Thickness of bed	3 4	3 4½	3 9	4 4	3 3½
Thickness of coal sampled	3 4	3 4½	3 6	4 3¾	3 3½

[a] Not included in sample.

Section A (sample 19727) was cut at face of 8 west entry, 1,650 feet southwest of the opening. Section B (sample 19728) was cut at face of 6 room, 7 east entry, 1,350 feet southwest of the opening. Section C (sample 19729) was cut at face of 12 room, 8 east entry, 1,850 feet southeast of the opening. Section D (sample 19730) was cut at face of 10 room, 7 east entry, 1,700 feet southeast of the opening. Section E (sample 19731) was cut at face of main slope, 1,800 feet south of the opening.

The ultimate analysis of a composite sample made by combining face samples 19727, 19728, 19729, 19730, and 19731 is given under laboratory No. 19732.

Room-and-pillar system of mining. In 1914 the slope was sunk to the 9th level, a distance of 2,000 feet. Post puncher machines were used in two entries; in the rest of the mine the coal was shot off the solid. Black blasting powder, dynamite, and permissible explosives were used. The shooting was done by shot firers after miners were out. Thirty-five per cent of the coal was screened. The coal is naturally dry, but the entries were fairly wet. The output was about 300 tons per day, 60 per cent of which was from advance workings.

For geologic relations of this coal see U. S. Geol. Survey Bull. 260, 1905, p. 382.

ROGERS COUNTY.

CATALE. CATALE NO. 1 MINE.

Analysis 20780 (p. 68). Bituminous coal Oklahoma field, from Catale No. 1 mine, a shaft mine in sec. 14, T. 24 N., R. 18 E., 1 mile northeast of Catale, a station on the St. Louis & San Francisco R. R. Coal bed, not named; Carboniferous (Allegheny) age, Cherokee formation. Roof, hard shale; floor, clay, cover at point of sampling, 70 feet. Sample was cut 300 feet northwest of the shaft on December 15, 1914, by C. D. Smith, and represented 1 foot 10 inches of coal, the thickness of the bed.

CLAREMORE. MCNUTT MINE.

Analysis 20781 (p. 68). Bituminous coal, Oklahoma field, from McNutt mine, a slope mine in sec. 22, T. 22 N., R. 16 E., 5 miles northeast of Claremore, a station on the St. Louis & San Francisco R. R. and the St. Louis, Iron Mountain & Southern Ry. Coal bed, not named; Carboniferous (Allegheny) age, Cherokee formation. Roof, shale; floor, clay; cover at point of sampling, 25 feet. The sample was cut in the slope 50 feet north of mine mouth on December 17, 1914, by C. D. Smith, and represented 1 foot 7 inches of coal, the thickness of the bed.

COLLINSVILLE. NEW STATE STRIP PIT.

Analysis 20714 (p. 68). Bituminous coal, Oklahoma field, from New State strip pit, in sec. 21, T. 22, N., R. 14 E., one-half mile north of Collinsville, on the Atchison, Topeka & Santa Fe Ry. Coal bed, Dawson; Carboniferous (Pennsylvanian) age, Coffeyville (?) formation. Roof, shale; floor, clay. The sample was cut from face of open pit on December 10, 1914, by C. D. Smith, and represented 1 foot 9 inches of coal, the thickness of the bed.

TULSA COUNTY.

DAWSON. SOUTHWESTERN NO. 1 MINE.

Analysis 20712 (p. 68). Bituminous coal, Oklahoma field, from Southwestern No. 1 mine, a slope mine in sec. 28, T. 20 N., R. 13 E., one-half mile west of Dawson, on the St. Louis & San Francisco R. R. Coal bed, Dawson; Carboniferous (Pennsylvanian) age, Coffeyville (?) formation. Roof and floor, shale. The sample was cut in the mine 500 feet north of slope mouth on December 9, 1914, by C. D. Smith, and represented 2 feet of coal, the thickness of the bed.

TULSA. DRILL HOLE.

Analysis 18247 (p. 68). Bituminous coal, Oklahoma field, from drill hole in SW. ¼ SE. ¼ sec. 30, T. 18 N., R. 12 E., south of Tulsa. Coal bed, not named; Carboniferous age. Sample was taken by A. G. Heggem in November, 1913. It represented selected pieces of coal from oil-well drillings.

TULSA. HICKORY NO. 2 MINE.

Analysis 20713 (p. 69). Bituminous coal, Oklahoma field, from Hickory No. 2 mine, a shaft mine in sec. 17, T. 19 N., R. 13 E., 4 miles southeast of Tulsa, on the Missouri, Kansas & Texas Ry. Coal bed, Dawson; Carboniferous (Pennsylvanian) age, Coffeyville (?) formation. Roof and floor, shale. The sample was cut in mine 300 feet southeast of shaft December 9, 1914, by C. D. Smith, and represented 2 feet 6½ inches of coal, the thickness of the bed.

WAGONER COUNTY.

BROKEN ARROW. ARKANSAS VALLEY STRIP PIT.

Analysis 20832 (p. 69). Bituminous coal, Oklahoma field, from Arkansas Valley strip pit in sec. 15, T. 18 N., R. 15 E., 3½ miles northeast of Broken Arrow, on the Missouri, Kansas & Texas Ry. Coal bed, not named; Carboniferous (Pennsylvanian) age, Cherokee formation. Roof, shale; floor, clay. The sample was cut from open pit on December 19, 1914, by C. D. Smith, and represented 2 feet of coal, the thickness of the bed. The coal contained some "sulphur" bands.

OREGON.

CLACKAMAS COUNTY.

WILHOIT. PROSPECT.

Analysis 22492 (p. 69). Bituminous (?) coal, from a prospect in sec. 15, T. 6 S., R. 2 E., one-half mile southeast of Wilhoit and 10 miles south of Mohalla on a branch of the Southern Pacific R. R. Coal bed, not named. Roof, sandstone, clay, and bone; floor, clay with thin seams of coal. The bed was sampled in the mine 10 feet from opening by A. J. Collier on June 9, 1915, as described below:

Section of coal bed in Wilhoit prospect.

	Ft.	in.
Roof, sandstone, clay, and thin coal	[a] 1	6
Coal		6
Bone		[a] 5
Coal	1	0
Floor, clay with thin seams of coal	[a] 1	6
Thickness of bed	4	11
Thickness of coal sampled	1	6

[a] Not included in sample.

COOS COUNTY.

WEST FORK. CABIN PROSPECT.

Analysis 17707 (p. 69). Bituminous coal, Eden Ridge field, from prospect in T. 33 S., R. 11 W., about 40 miles south of Myrtle Point station on the Coos Bay, Roseburg & Eastern R. R., and 35 miles west of West Fork station on the Southern Pacific R. R. Coal bed, not named; Tertiary (Eocene) age, Arago formation. Dip, 24° N. 65° E. The bed was sampled by C. E. Lesher on August 17, 1913, as described on page following.

Section of coal bed in Cabin prospect.

	Ft.	in.
Roof, not noted.		
Coal	2	7
Shale and clay		[a]4
Coal	3	1
Floor, not noted.		
Thickness of bed	6	0
Thickness of coal sampled	5	8

[a] Not included in sample.

The sample was taken at the face 20 feet from surface. Coal was mostly crushed, but the floor and the roof coal was solid. Sample fresh and very wet; coal will coke. Bed being wet and crushed, a detailed section could not be measured, but all the bone is believed to be below the parting.

For geologic relations of this coal see U. S. Geol. Survey Bull. 541, 1914, p. 399.

West Fork. Everett Association Prospect.

Analysis 17708 (p. 69). Bituminous coal, Eden Ridge field, from prospect in T. 33 S., R. 11 W., about one-half mile above Forty-Foot Falls on the south fork of the Coquille River about 39 miles south of Myrtle Point, and 35 miles west of West Fork. Coal bed, Meyers; Tertiary (Eocene) age, Arago formation. Dip, 2° N. 30° W. Roof, dark shale. The bed was sampled by C. E. Lesher on August 19, 1913, as shown below:

Section of coal bed in the Everett Association prospect.

	Ft.	in.
Roof, shale, dark.		
Shale, hard, carbonaceous		[a]6
Coal, bony		7
Bone		1
Coal, bony		3
Coal, good		11
Clay		[a]3
Coal, soft, flaky in places	3	4
Coal (not mined)	[b]	
Floor, not exposed.		
Thickness of coal mined	5	11
Thickness of coal sampled	5	2

[a] Not included in sample. [b] Not measured.

The sample was taken in the entry, 35 feet from the entrance, on the left wall. Roof is solid; coal is somewhat loose and when picked falls easily. Below the part sampled a hole had been dug 6 feet without reaching solid floor. The coal was very wet and water was running into the adit at the time of sampling.

For geologic relations of this coal see U. S. Geol. Survey Bull. 541, 1914, p. 399.

West Fork. G. W. Donnell Prospect.

Analysis 17706 (p. 69). Bituminous coal, Eden Ridge field, from prospect in T. 33 S., R. 11 W., about 40 miles south of Myrtle Point and 35 miles west of West Fork. Coal bed not named; Tertiary (Eocene) age, Arago formation. Roof, hard dark shale; floor, not exposed. The bed was sampled by C. E. Lesher on August 18, 1913, as described on page following.

Section of coal bed in the G. W. Donnell prospect.

	Ft.	in.
Roof, shale.		
Coal		[a] 1½
Bone		[a] 1
Coal		[a] 1½
Bone		[a] 1
Coal, bony		2
Coal		9
Bone		1
Coal		2
Bone		¼
Coal, bony		1¾
Coal		3
Bone		½
Coal		7
Clay, white		[a] 2
Shale, carbonaceous		[a] 5
Coal		2½
Bone		¼
Coal, bony		2¾
Coal		3
Coal, bony		2
Coal, fair		1½
Coal, good		2½
Coal, bony		3½
Coal		7
Do		[b]
Floor, concealed.		
Thickness of bed measured	5	1½
Thickness of coal sampled	4	3½

[a] Not included in sample. [b] Not measured

Sample was taken at the face of a 40-foot adit. Sample wet.

For geologic relations of this coal see U. S. Geol. Survey Bull. 541, 1914, p. 399.

West Fork. Pulford Prospect.

Analyses 19877 and 19878 (p. 69). Bituminous coal, Eden Ridge field, from Pulford prospect, in SE. ¼ SW. ¼ sec. 20, T. 32 S., R. 11 W., 35 miles west of West Fork. Coal bed, Anderson; Tertiary (Eocene) age, Arago formation. Thickness, 5 feet. Roof and floor, hard shale; dip, 16° S.; cover at point of sampling, 75 feet. The bed was sampled by C. E. Lesher on September 22, 1914, as described below:

Section of coal bed in prospect 35 miles west of West Fork.

Section	A	A
Laboratory No.	19877	19878
	Ft. in.	Ft. in.
Roof, hard shale overlain with sandstone.		
Coal, bony	11½	[a] 11½
Coal	5	[a] 5
Coal, bony	4	[a] 4
Clay parting	[a] 2½	[a] 2½
Coal	2	[a] 2
Bone	¾	[a] ¾
Coal, bony	2¼	[a] 2¼
Coal	4	[a] 4
Bone	[a] 8	[a] 8
Black coaly mud	[a] 1 8	1 8
Floor, hard shale.		
Thickness of bed	5 0	5 0
Thickness of coal sampled	2 5½	1 8

[a] Not included in sample.

The bed was measured at one point and two samples were taken from the section; sample 19877 represented the upper bench of the coal and sample 19878 the lower bench. The samples were cut in the drift 125 feet from the mouth and 4 feet from face.

WEST FORK. REEVES PROSPECT.

Analysis 17704 (p. 69). Bituminous coal, Eden Ridge field, from Reeves prospect, in NW. ¼ NW. ¼ sec. 28, T. 32 S., R. 11 W., 35 miles west of West Fork and 35 miles south of Myrtle Point. Coal bed, Carter; Tertiary (Eocene) age, Arago formation. Dip, about 12° W. Roof and floor, hard black shale. The bed was sampled by C. E. Lesher on August 3, 1913, as shown below:

Section of coal bed in Reeves prospect.

	Ft.	in.
Roof, shale, black, hard.		
Coal		3
Bone		1
Coal		6
Coal, bony		1
Coal		8
Bone		1
Coal, bony		3½
Shale		[a] 4
Coal		6
Bone		1½
Coal		2
Bone		1½
Coal		4
Bone		1
Coal		7
Shale		[a] 3
Coal		11
Shale		[a] 2
Bone		[a] 5
Coal, bony		[a] 7
Bone		[a] 1
Coal, bony		[a] 18
Floor, shale, black, hard.		
Thickness of bed	8	1½
Thickness of coal sampled	4	9½

[a] Not included in sample.

The sample was taken at face of drift, 110 feet from entrance. Dip of drift, 8° N. 15° W.

For geologic relations of this coal, see U. S. Geol. Survey Bull. 541, 1914, p. 399.

WEST FORK. W. B. MEYERS PROSPECT.

Analysis 17705 (p. 69). Bituminous coal, Eden Ridge field, from W. B. Meyers prospect in T. 33 S., R. 11 W., about 39 miles south of Myrtle Point and 35 miles west of West Fork. Coal bed, Meyers; Tertiary (Eocene) age, Arago formation. Dip, 13° N. The bed was sampled by C. E. Lesher on August 10, 1913, as described below:

Section of coal bed in the W. B. Meyers prospect.

	Ft.	in.
Roof, shale, hard, dark.		
Coal		7
Coal, soft, bony		5
Coal, mashed		3½
Coal, bony		7
Bone		1
Coal		10½
Clay, white		[a] 4
Coal, shattered	1	8
Coal, bony		4
Coal, solid	2	1
Coal, bony	1	6
Floor, clay, blue.		
Thickness of bed	8	9
Thickness of coal sampled	8	5

[a] Not included in sample.

Sample taken at face of adit, 50 feet in.

For geologic relations of this coal, see U. S. Geol. Survey Bull. 541, 1914, p. 399.

GRANT COUNTY.

Dayville. Old Prospect.

Analysis 18125 (p. 69). Lignite from an old prospect in NW. ¼ NW. ¼ sec. 11, T. 13 S., R. 27 E., 5½ miles east of Dayville and 40 miles west of Prairie City, on Sumpter Valley R. R. Lignite bed, not named; Tertiary (Miocene) age, Mascall formation. Strike, N. 60° W.; dip, 10° SW. Roof and floor, tufaceous clay. The bed was sampled July 26, 1913, by A. J. Collier and G. J. Mitchell, as described below:

Section of lignite bed in old prospect 5½ miles east of Dayville.

	Ft.	in.
Roof, soft sandstone.		
Lignite	[a]1	0
Sandstone		[a]6
Lignite	2	2
Sandstone, white, clayey		[a]4
Lignite, impure	[a]1	8
Floor, clay.		
Thickness of bed	5	8
Thickness of lignite sampled	2	2

[a] Not included in sample.

The depth of cover at the point of sampling was about 3 feet. The lignite was probably weathered.

WHEELER COUNTY.

Fossil. Dry Hollow Prospect.

Analyses 18126 and 18127 (p. 69). Subbituminous coal from a prospect drift not worked for 10 years, in SW. ¼ SE. ¼ sec. 28, T. 8 S., R. 21 E., 32 miles south of Condon and 12 miles south of Fossil, which is on a branch of the Oregon & Washington Ry. & Navigation Co. Coal bed, not named; Tertiary (Eocene) age, Clarno formation. Thickness, 11 feet. Roof, shale; floor, tuff. The bed was sampled by A. J. Collier and G. J. Mitchell on July 4, 1913, as shown below:

Section of coal bed in Dry Hollow prospect.

Section	A		A	
Laboratory No.	18126		18127	
	Ft.	in.	Ft.	in.
Roof, hard shale.				
White shale, probably volcanic ash (1 foot).				
Light brown shale (10 inches).				
Coal and bone	[a]1	0	1	0
Coal and bone	1	6	1	6
Tufaceous sandstone		[a]6		[a]6
Coal and bone	1	6	[a]1	6
Coal and bone	5	6	5	6
Floor, light brown shale.				
Thickness of bed	10	0	10	0
Thickness of coal sampled	8	6	8	0

[a] Not included in sample.

The section was measured at a point on north side of drift, 20 feet from entrance. Sample 18126 represented the upper part of the section and sample 18127 the lower part. The tunnel was 130 feet long and runs N. 80° E.

PENNSYLVANIA.

ALLEGHENY COUNTY.

BRUCETON. EXPERIMENTAL MINE.

Analyses 18843, 18845, 18847, and 22618 (p. 70). Bituminous coal, Pittsburgh field, from experimental mine of the United States Bureau of Mines, about 1 mile south of Bruceton and connected with the Baltimore & Ohio R. R. near Wallace station. Coal bed, Pittsburgh; Carboniferous age, Monongahela formation. Bed lies practically horizontal. Average thickness, about 5 feet 3 inches. Roof, "draw slate," 10 to 12 inches thick, above which there are strata of coal interlain by shale. Coal above "draw slate" adheres to the shale partings. Floor, clay. Cover, about 125 feet. The bed was sampled in three sections, at one point in the mine by L. M. Jones and O. C. Ralston on March 4, 1914, as described below:

Section of coal bed in experimental mine.

Laboratory No.	18843, 18845, 18847
	Ft. in.
Roof, "draw slate."	
Coal	*1 4
Bone	*½
Coal	†1 7
Shale	†¼
Coal	†3½
Shale	†½
Coal	‡1½
"Sulphur" band	‡½
Coal	‡9¾
Bone	‡¼
Coal	‡10¼
Coal, dirty	‡3½
Floor, underclay.	
Thickness of bed	5 6

Sample 18847 was taken from 1 cut-through between 1 and 2 rooms 1 east butt entry, 8 feet from east rib of 1 room, about 1,000 feet from mouth of mine and represented the parts of the section indicated by an asterisk (*). Sample 18843 represented the parts of the above section indicated by a dagger (†). Sample 18845 represented the parts of the above section indicated by a double dagger (‡).

The bed was also sampled on July 21, 1915, by H. C. Howarth. The sample (No. 22618) was cut from face of 2 room, 1 butt entry.

The experimental mine is opened by two parallel entries, and is used for experiments made in connection with investigations of the Bureau of Mines. No attempt is made to produce coal to supply a regular demand. All the coal is shipped as run of mine.

For descriptions and analyses of other samples of coal from this mine, see Bureau of Mines Bull. 85, 1914, pp. 257–259.

CARNEGIE. MANSFIELD MINE.

Analyses 17680, 18186, 18535, 18880, and 19430 (p. 70). Bituminous coal, Pittsburgh field, from Mansfield mine, a drift mine in the Pittsburgh district at Carnegie, on the Pittsburgh, Cincinnati, Chicago & St. Louis Ry. Coal bed, Pittsburgh or No. 8; Carboniferous age, Monongahela formation. Roof, shale; floor, underclay. The bed lies practically horizontal. Particles of roof and floor do not mix with the coal to any extent in mining. Five carload lots were sampled from this mine by E. R. Linkenhoker, as they were being unloaded at the Bureau of Mines testing plant, Pittsburgh, Pa., as described below. The coal was used for combustion tests. Sample

17680 represented a 57½-ton car of slack coal sampled August 27, 1913 (Pittsburgh test No. 409). Sample 18186 represented a 50-ton car of slack coal, sampled November 26, 1913 (Pittsburgh test No. 424). Sample 18535 represented a 50-ton car of slack coal, sampled February 2, 1914 (Pittsburgh test No. 439). Sample 18880 represented a 50-ton car of slack coal sampled March 16, 1914 (Pittsburgh test No. 453). Sample 19430 represented a 50-ton car of slack coal sampled May 18, 1914 (Pittsburgh test No. 469).

ELIZABETH. PATTERSON NO. 2 MINE.

Analyses 20032 and 20034 (p. 71). Bituminous coal, Pittsburgh field, from Patterson No. 2 mine, a slope mine at Elizabeth, southeast of Wylie, on the Pittsburgh & Lake Erie R. R. Coal bed, Pittsburgh; Carboniferous age, Monongahela formation. Dip, 2° SW. Average thickness, 5 feet. Roof, "draw slate," overlain by shale; floor, clay. Cover at points of sampling, 150 feet. The bed was sampled by R. H. Seip on October 27, 1914, as described below:

Sections of coal bed in Patterson No. 2 mine.

Section	A	B
Laboratory No.	20032	20034
Roof, "draw slate."	*Ft. in.*	*Ft. in.*
Coal	2 5¾	2 2
Shale	½	¼
Coal	8½	10
Shale	*a*¾	.. ..
Shale and sulphur	.. ..	¼
Coal	1 10½	3
Shale binder	.. ..	*a*¾
Coal with dirty streaks	.. ..	1 8¾
Dirty coal	*a*4	*a*4
Floor, clay.		
Thickness of bed	5 6	5 5
Thickness of coal sampled	5 1¼	5 ¼

a Not included in sample.

Section A (sample 20032) was cut from rib of 11 face entry, 93 feet inby 14 butt entry. Section B (sample 20034) was cut from pillar of 9 butt entry, near 11 face entry.

The mine is worked on the room-and-pillar system. In 1914 the coal was undercut with machines. Daily output in 1914, 1,200 to 1,500 tons.

BEDFORD COUNTY.

HOPEWELL. CAMBRIA NO. 2 MINE.

Analyses W46790 to W46794, and 19611 (p. 71). Semibituminous coal, Broadtop field, from Cambria No. 2 mine, a drift mine 2 miles southeast of Hopewell on a branch of the Huntingdon & Broad Top Mountain R. R. Coal bed, Upper Freeport, locally known as the Kelley; Carboniferous age, Allegheny formation. Dip, regular, ranging from horizontal to 85°. Thickness, 3 to 4 feet; average, 3½ feet. The coal is clean with the exception of 2 to 5 inches of bony coal about 1 foot from the top. Roof, shale of poor quality; floor, bone coal and smooth brittle underclay. Particles of the roof and floor do not become mixed with the coal in mining. The coal bed was sampled by H. I. Smith and J. R. Fleming on June 25, 1914, as described on page following.

Sections of coal bed in Cambria No. 2 mine.

Section	A	B	C	D	E
Laboratory No.	W46793	W46790	W46794	W46792	W46791
Roof, shale.					
Coal	1 4½	1 2½	10	1 2½	10¾
"Sulphur"	a½	.. ..	.. ..	.. ..	a¼
Coal	.. ..	.. ..	.. ..	.. ..	1½
Bone and cannel	2	5	3½	3	2
Coal	8	.. ..	6	3½	4
Coal, soft	6½	5	5	6	6
Coal	1 2½	1 1½	1 5	1 4	1 3½
Floor, bony coal and clay.					
Thickness of bed	4 0	3 2	3 5½	3 7	3 4
Thickness of coal sampled	3 11½	3 2	3 5½	3 7	3 4

a Not included in sample.

Section A (sample W46793) was measured at face of last room in Fisher heading. Section B (sample W46790) was measured at face of Young heading. Section C (sample W46794) was measured at face of 9 room, inby 4 side track on main level. Section D (sample W46792) was measured at face of main air entry. Section E (sample W46791) was measured at face of left-hand level, dip heading.

The ultimate analysis of a composite sample made by combining samples W46790, to W46794 is given under laboratory No. 19611.

The mine is worked by the room-and-pillar system. In 1914 the coal was mined by bearing in on the soft part of the bed about 1 foot 3 inches from the bottom and was broken down by wedging or with black blasting powder, about 1 pound of powder being used for 8 tons of coal. The entire output was shipped as run of mine. One picker was employed to a car. There was one loading track with a capacity of 14 empty and 28 loaded cars. Average daily output of mine, 225 tons; maximum day's run, 250 tons.

Hopewell. Chevington No. 3 and Glendale Nos. 1 and 2 Mines.

Analyses W46785 to W46789, 19612, and 19613 (p. 71). Semibituminous coal, Broadtop field, from Chevington No. 3 and Glendale Nos. 1 and 2 mines, drift mines, 3 and 3½ miles southeast of Hopewell on a branch of the Huntingdon & Broad Top Mountain R. R. Coal bed, Barnett; Carboniferous age, Allegheny formation. Thickness is fairly uniform and ranges from 2 feet 10 inches to 3 feet 8 inches; dip varies from horizontal to 85°. The coal is clean with the exception of about 10 inches of bone at the top and 3 to 6 inches of shale near the middle of the bed. Roof, shale, overlain by sandstone; floor, bony coal about 12 inches thick, underlain by black shale. The coal was sampled by H. I. Smith and J. R. Fleming on June 26, 1914, as described below:

Sections of coal bed in Chevington No. 3 and Glendale Nos. 1 and 2 mines.

Section	A	B	C	D	E
Laboratory No.	W46787	W46788	W46789	W46785	W46786
Roof, shale.					
Bone	a 9	a 9	a 1 1	a 6¼	a 10½
Coal, hard, gray	.. ..	.. ..	11½	.. ..	.. ..
Coal	9½	9½	.. ..	5¾	6½
Shale	a 3	a 3	.. ..	a 5	a 6
Coal	1 5½	1 5½	1 4	1 1¾	1 0
"Mother coal" and "sulphur"	.. ..	.. ..	Streak.	¼	Ball.
Coal	.. ..	.. ..	3½	3¾	3½
Floor, bony coal and black shale.					
Thickness of bed	3 3	3 3	3 8	2 10¾	3 2½
Thickness of coal sampled	2 3	2 3	2 7	1 11½	1 10

a Not included in sample.

Section A (sample W46787) was measured at face of last room on level heading, 400 feet from mouth of Glendale No. 2 mine. Section B (sample W46788) was cut from a section, one side of which joined section A. Section C (sample W46789) was measured at face of level drift, 1,000 feet from mouth of Glendale No. 1 mine. Section D (sample W46785) was measured at face of 1 room, dip heading, 300 feet from mouth of Chevington No. 3 mine. Section E (sample W46786) was measured at face of dip heading, 500 feet from mouth of Chevington No. 3 mine.

Ultimate analyses of composite samples made by combining samples W46785 and W46786 and W46787 and W46788 are given under laboratory Nos. 19613 and 19612, respectively.

Glendale Nos. 1 and 2 mines and Chevington No. 3 mine are opened by drifts all within a distance of one-half mile. They are operated by the room-and-pillar system. In 1914 the coal was undercut by hand and shot down with black blasting powder, dynamite being used for brushing the roof and floor where wet. The entire output was shipped as run-of-mine, each mine having its own tipple. The combined daily output of the three mines was about 55 tons, Glendale No. 1 producing 15 tons; Glendale No. 2, 15 tons; and Chevington No. 3, 25 tons. This tonnage was derived principally by developing the higher dipping and deeper parts of the bed, the flatter and more accessible parts having been more or less worked out.

BUTLER COUNTY.

BUTLER. MUNTZ MINE.

Analysis 23128 (p. 71). Bituminous coal, Butler field, from Muntz mine just south of Butler. Coal bed, upper Freeport or E; Carboniferous age, Allegheny formation. Thickness, 3 feet 1 inch. Roof, cannel coal and shale; floor, clay. Cover at point of sampling, 150 feet. The sample was cut by R. Van A. Mills on October 28, 1915, at a point one-fourth mile southeast of mine mouth and represented 3 feet 1 inch of coal.

BUTLER. THOMPSON MINE.

Analysis 23064 (p. 71). Bituminous coal, Butler field, from Thompson mine, a shaft mine 1 mile east of Butler, not directly on any railroad. Coal bed, Upper Kittanning or C′; Carboniferous age, Allegheny formation. Thickness 2 feet 4 inches. Shaft, 50 feet deep. Cover at point of sampling, 75 feet. The bed was sampled by G. B. Richardson on October 20, 1915, as described below:

Section of coal bed in Thompson mine.

	Ft.	in.
Roof, not noted.		
Coal		7
Shale		[a]1
Coal	1	8
Floor, not noted.		
Thickness of bed	2	4
Thickness of coal sampled	2	3

[a] Not included in sample.

The sample was taken at a point 250 feet northeast of shaft.

BUTLER. ZENITH NO. 1 MINE.

Analyses 23132 to 23134 (p. 71). Bituminous coal, Butler field, from Zenith No. 1 mine, a slope mine 2 miles north of Butler, on the Bessemer & Lake Erie R. R. Coal bed, Upper Kittanning or C′; Carboniferous age, Allegheny formation. Thickness, 2½ to 3 feet. Roof, black shale; floor, clay. The bed was sampled by R. Van A. Mills on October 27, 1915, as described on page following.

Sections of coal bed in Zenith No. 1 mine.

Section	A	B
Laboratory No.	23132	23133
Roof, black shale.	*Ft. in.*	*Ft. in.*
Coal, hard	7	8
Coal, bony	[a] 1	[a] 1½
Coal, hard	1 9	2 0
Floor, hard fire clay.		
Thickness of bed	2 5	2 9½
Thickness of coal sampled	2 4	2 8

[a] Not included in sample.

Section A (sample 23132) was taken at face of 2 entry, 1,500 feet northwest of mine mouth. Section B (sample 23133) was taken at face of 3 entry, 1,000 feet southwest of mine mouth.

An ultimate analysis of a composite sample made by combining face samples 23132 and 23133 is given under laboratory No. 23134.

Daily production, 200 tons.

Butler. Vogeley Mine.

Analysis 23065 (p. 71). Bituminous coal, Butler field, from Vogeley mine, a drift mine 2 miles southeast of Butler, on the Pennsylvania R. R. Coal bed, Upper Freeport, or E; Carboniferous age, Allegheny formation. Thickness, 3 feet 2 inches. Roof, shale; floor, clay. The bed was sampled by G. B. Richardson on October 20, 1915. The sample was taken in the mine 2,200 feet north of the mine mouth and represented 3 feet 2 inches of coal.

Chicora. Cunningham Mine.

Analysis 23066 (p. 72). Bituminous coal, Butler field, from Cunningham mine, 1 mile southwest of Chicora, on the Baltimore & Ohio R. R. Coal bed, Upper Freeport, or E; Carboniferous age, Allegheny formation. Thickness, about 3½ feet. Roof, shale and bony coal overlain by sandstone; floor, clay. The bed was sampled by G. B. Richardson on October 20, 1915, as described below:

Section of coal bed in Cunningham mine.

	Ft.	*in.*
Roof, shale and bony coal.		
Coal	2	3
Shale		¼
Coal	1	4
Floor, clay.		
Thickness of bed	3	7¼
Thickness of coal sampled	3	7¼

The sample was taken from 15 room, 1 right entry, straight entry, and 3,600 feet southwest of the mine mouth.

Claytonia. Stage Mine.

Analysis 23126 (p. 72). Bituminous coal, Butler field, from Stage mine, a slope mine at Claytonia, in Clay Township. Coal bed, Middle Kittanning(?); Carboniferous age, Allegheny formation. Thickness, 3 feet. Roof, carbonaceous sandstone; floor, soft clay. The bed was sampled by R. Van A. Mills on October 26, 1915. The sample was taken at face of 1 working breast, 2 right entry, 1½ miles north of mine mouth, and represented 3 feet of coal.

In 1915 the daily production was 250 tons.

JAMISONVILLE. VICTORIA MINE.

Analyses 23129 to 23131 (p. 72). Bituminous coal, Butler field, from Victoria mine, a drift mine 1 mile north of Jamisonville, in Center Township. Coal bed, Upper Freeport, or E bed; Carboniferous age, Allegheny formation. Thickness, 3½ feet. Roof, black shale; floor, hard clay. The bed was sampled by R. Van A. Mills on October 27, 1915, as described below:

Sections of coal bed in Victoria mine.

Section	A	B
Laboratory No.	23129	23130
Roof, black shale.	*Ft. in.*	*Ft. in.*
Coal, with streaks of "sulphur"	1 2	1 2
Bone, with streaks of coal	[a] 4½	[a] 6
Coal	1 11	1 8
Floor, hard clay.		
Thickness of bed	3 5½	3 4
Thickness of coal sampled	3 1	2 10

[a] Not included in sample.

Section A (sample 23129) was taken from face of main entry, 3,000 feet east-northeast of mine mouth. Section B (sample 23130) was taken from breast of room, 7 right entry, 1,700 feet east of mine mouth.

An ultimate analysis of a composite sample made by combining samples 23129 and 23130 is given under laboratory No. 23131.

JEFFERSON CENTER. REAMER MINE.

Analysis 23127 (p. 72). Bituminous coal, Butler field, from Reamer (country bank) mine, 1½ miles southwest of Jefferson Center, on the Bessemer & Lake Erie R. R. Coal bed, Upper Freeport, or E; Carboniferous age, Allegheny formation. Thickness, 2 feet 2 inches. Roof, black shale; floor, hard clay. The sample was cut by R. Van A. Mills on October 28, 1915, 1,200 feet northwest of mine mouth and represented 2 feet 2 inches of coal.

UNIONVILLE. EAGLE MINE.

Analysis 23125 (p. 72). Bituminous coal, Butler field, from Eagle (country bank) mine in Center Township, one-half mile east of Unionville and 2 miles south of Queen Junction, on the Bessemer & Lake Erie R. R. Coal bed, Upper Freeport or E; Carboniferous age, Allegheny formation. Thickness, 3 feet 8 inches. Roof, black shale; floor, hard clay. The bed was sampled by R. Van A. Mills on October 24, 1915, as described below:

Section of coal bed in Eagle mine.

	Ft. in.
Roof, black shale.	
Coal	2 6
"Sulphur" and shale	[a] 3
Coal	11
Floor, hard clay.	
Thickness of bed	3 8
Thickness of coal sampled	3 5

[a] Not included in sample.

The sample was taken at working face of main entry, 1,500 feet slightly west of south of mine mouth.

CAMBRIA COUNTY.

BEAVERDALE. BEAVER RUN MINE.

Analyses 20284 to 20290 (pp. 72–73). Semibituminous coal, Windber field, from Beaver Run mine, a slope and drift mine in Summer Hill Township, one-quarter mile from Beaverdale, on the South Fork branch of the Pennsylvania R. R. Coal bed, Upper Freeport or E; Carboniferous age, Allegheny formation. Thickness, 3 feet to 3 feet 8 inches. Roof, hard gray shale ranging up to 2 feet thick, overlain by a 19-inch seam of roof coal, above which is hard gray shale with smooth surface; floor, hard gray underclay with comparatively smooth surface. The bed was sampled by G. E. McElroy on December 2, 1914, as described below:

Sections of coal bed in Beaver Run mine.

Section	A	B	C	D	E	F
Laboratory No.	20284	20285	20286	20287	20288	20289
Roof, gray shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Soft coal	1	4	½	1 3	1	1 1½
"Mother coal"	Streak.	.. ..	1/16	.. ..	1/8	.. ..
"Sulphur"	.. ..	.. ..	.. ..	.. ..	.. ..	1/8
Soft coal	1	.. ..	1	.. ..	.. ..	5⅝
"Mother coal"	a ¼	1/8	1/8	1/8	.. ..	.. ..
"Sulphur" band	.. ..	.. ..	.. ..	.. ..	.. ..	a ½
Soft coal	1 3½	1 2⅞	1 5 1⅜	6⅞	1 ⅜	4
"Mother coal"	.. ..	.. ..	.. ..	.. ..	a ¼	a ¼
Hard coal	8	8	8	8	1 ¼	8
Parting shale binder	a 1	a 1	a 1½	a 1	a ½	a 1½
Soft coal	11½	10	1 0	1 0	1 ½	10½
Floor, underclay.						
Thickness of bed	3 2	3 2	3 5	3 7	3 3	3 8
Thickness of coal sampled	3 ¾	3 1	3 3½	3 6	3 2¼	3 5¾

a Not included in sample.

Section A (sample 20284) was cut from face of main slope, 2,000 feet north of slope mouth. Section B (sample 20285) was cut from face of 3 dip entry, main slope, 2,000 feet N. 45° W. of slope mouth. Section C (sample 20286) was cut from face of 1 left heading, 3 dip entry, 1,200 feet N. 45° W. of slope mouth. Section D (sample 20287) was cut from rib of crosscut 100 feet outby face of 4 right heading, 2,900 feet N. 30° E. of slope mouth. Section E (sample 20288) was cut from face of 3 right advance heading, 4,300 feet N. 70° E. of slope mouth. Section F (sample 20289) was cut from face of slant heading, drift heading, 4,900 feet N. 80° E. of slope mouth.

The ultimate analysis of a composite sample made by combining face samples 20284 to 20289 is given under laboratory No. 20290.

The mine was originally opened by a slope, through which in 1914 about three-fourths of the output was handled by rope haulage, the rest of the output being transported by electric locomotive through slant headings to a drift opening. It was planned to operate the east, or right headings, from the drift, and the west, or left headings, from the slope. The new wooden tipple had one loading track with a storage capacity of 22 cars, but could operate two shifts a day, or a total capacity of 44 cars. The whole output, excluding "roof coal," was shipped as run-of-mine. The roof coal was kept separate and sold for domestic use in the vicinity of the mine. The coal was undercut with chain and puncher machines and shot down with black blasting powder. The output averaged about 900 tons per day. There was about 2,200 acres of unmined coal.

BEAVERDALE. LOGAN NO. 6½ MINE.

Analyses 22448 to 22453 (p. 73). Semibituminous coal, Windber field, from Logan No. 6½ mine, a drift mine about one-quarter mile north of Beaverdale station, on the South Fork branch of the Pennsylvania R. R. Coal bed, Lower Freeport or D; Carboniferous age, Allegheny formation. Average thickness, 4 feet; maximum dip, 8

per cent northwest. Roof, hard dark gray shale, floor, fireclay; immediate floor, 6 to 12 inches of hard bony coal. The bed was sampled by E. H. Denny, on June 14 and 15, 1915, as described below:

Sections of coal bed in Logan No. 6½ mine.

Section	A	B	C	D	E
Laboratory No	22449	22452	22451	22448	22450
Roof, hard dark-gray shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Bony coal	.. ..	.. ..	*a* 2	.. ..	.. ..
Coal	7	1½	5	4	8
"Sulphur"	.. ..	.. ..	.. ..	½	.. ..
"Mother coal"	.. ..	⅛	.. ..	.. ..	.. ..
Coal	.. ..	.. ..	.. ..	3½	.. ..
Bone	*a* ½	.. ..	½	*a* ½	*a* ½
Coal	6½	4	.. ..	7	7½
"Sulphur"	.. ..	*a* ⅜	.. ..	⅜	1/16
"Mother coal"	¼	.. ..	.. ..	.. ..	.. ..
Coal	.. ..	1¾	.. ..	.. ..	.. ..
Bone	.. ..	*a* ⅜	.. ..	.. ..	.. ..
Coal	8¾	1 2	1 1½	5½	5½
Bone	*a* 1¾	*a* 1	*a* 1¼	*a* 3½	*a* 2¼
Coal	1½	.. ..	.. ..	.. ..	.. ..
"Sulphur"	*a* ⅜	.. ..	.. ..	.. ..	.. ..
Coal	1 6	1 3	1 9	1 6½	1 0
"Mother coal"	.. ..	.. ..	.. ..	.. ..	
"Sulphur" *b*	⅛	*a* 1	¼	¼	1/16
Coal	4	10	4½	3½	1 1½
Floor, hard, bony coal underlain with fire clay.					
Thickness of bed	4 ¾	4 1⅛	3 11⅞	3 10⅝	4 1⅛
Thickness of coal sampled	3 10⅝	3 10⅜	3 8⅜	3 6¼	3 10⅜

a Not included in sample.
b On sample B the 1 inch of "sulphur" appeared only on one edge of sample.

Section A (sample 22449) was cut at face of 26 room, main heading, about 4,200 feet S. 30° W. of drift mouth. Section B (sample 22452) was cut at face of main heading, about 4,800 feet S. 30° W. of drift mouth. Section C (sample 22451) was cut at face of 1 right heading, 2 left heading, main entry, about 3,600 feet S. 25° W. of drift mouth. Section D (sample 22448) was cut on left rib looking inby, about 70 feet from face of 2 right heading, 2 left heading, main entry, about 3,000 feet S. 20° W. of drift mouth. Section E (sample 22450) was cut on left rib of 11 room ("back heading"), about 25 feet from 1 left heading, main entry, about 1,200 feet south of drift mouth.

The ultimate analysis of a composite sample made by combining samples 22448 to 22252 is given under laboratory No. 22453.

The mine is worked by the room-and-pillar system, the rooms being opened up the pitch. In 1915 the coal was undercut by machine and shot down with black powder. Roof and floor material did not become mixed with the coal. All of the coal was shipped as run of mine. Two pickers were employed on the cars. Track capacity was 22 loaded and 22 empty cars. The output was derived entirely from advance work, few pillars having been pulled. Average daily output, 375 tons, which was to be increased when conditions justified. The probable lifetime of the mine was 30 years.

Bens Creek. Wilmore No. 1 Mine.

Analyses 20274 to 20276 and 20281 to 20283 (p.73). Semibituminous coal, Windber field, from Wilmore No. 1 mine, a slope mine 1 mile southwest of Bens Creek, with railroad connections on the Pennsylvania R. R. Coal bed, said to be Upper Freeport or E; Carboniferous age, Allegheny formation. Average thickness, 4 feet; dip, 5 to 6 per cent west. Roof, shale, with about 6 inches of bony coal as the immediate roof, floor, hard clay. The bed was sampled by L. M. Jones, D. J. Parker, G. E. McElroy and E. H. Denny on December 1, 1914, as described on page following.

Sections of coal bed in Wilmore No. 1 mine.

Section	A	B	C	D	E
Laboratory No.	20274	20275	20276	20281	20282
Roof, shale and sandstone.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal	1 7¼	2 5¾	2 7	1 6	1 4½
"Mother coal"	3/4	.. ..	.. ..	1/4	1/4
Coal	1 1/2	.. ..	.. ..	10½	11
Shale	a 2	a 1¼	a 1	a 2	a 2
Coal	.. ..	.. ..	8½	.. ..	.. ..
"Mother coal"	.. ..	.. ..	1/4	.. ..	.. ..
Coal	1 5½	1 6¼	10	1 5½	1 7½
Floor, clay.					
Thickness of bed	4 4	4 1¼	4 2½	4 0	4 1¼
Thickness of coal sampled	4 2	4 0	4 1½	3 10	3 11¼

a Not included in sample.

Section A (sample 20274) was cut from pillar in 10 room, 5 right entry, 1 slope, 1,575 feet N. 30° W. of slope mouth. Section B (sample 20275) was cut from pillar in 4 right entry, 300 feet from 2 slope, 1,500 feet S. 30° E. of slope mouth. Section C (sample 20276) was cut at face of 1 room, 4 right entry, 1 slope, 2,250 feet N. 10° W. of slope mouth. Section D (sample 20281) was cut from pillar in 6 room, 3 left entry, 2 slope, 2,300 feet N. 80° W. of slope mouth. Section E (sample 20282) was cut from pillar in 10 room, 4 left entry, 2 slope, 2,850 feet N. 80° W. of slope mouth.

The ultimate analysis of a composite sample made by combining face samples 20274, 20275, 20281, and 20282 is given under laboratory No. 20283.

The mine is opened by two slopes and is worked by the double-entry, room-and-pillar system. In 1914 the coal was mined with picks and shot down with black blasting powder. Material from the roof and floor did not become mixed with the coal in mining. The coal mined was a soft grade of bituminous coal. One wooden tipple received the output from both slopes. Most of the coal was shipped as run of mine, although bars spaced 1¼ inches apart could be used for screening. The lump coal was mostly small lump. There were two loading tracks with a capacity of 35 to 40 empty cars and the same number of loaded cars. There was about 600 acres of unmined coal. About 75 per cent of the future output was to be derived from advance work. The capacity of the mine in 1914 was 600 tons per day; maximum day's run, about 1,100 tons. The output could be increased if necessary.

Bens Creek. Wilmore Mine No. 3.

Analyses 20273 and 20277 to 20280 (p. 73). Semibituminous coal, Windber field, from Wilmore No. 3 mine, a slope mine in Washington Township, one-half mile northeast of Bens Creek, on the main line of the Pennsylvania R. R. Coal bed said to be Upper Freeport or E; Carboniferous age, Allegheny formation. Average thickness of bed, 4 feet; dip, about 7 per cent northwest. Main roof is shale 2 to 8 feet thick, with about 10 inches of bone as the immediate roof; floor, shale with clay underneath. The bed was sampled by E. H. Denny on December 2, 1914, as described below:

Sections of coal bed in Wilmore No. 3 mine.

Section	A	B	C	D
Laboratory No.	20273	20277	20278	20279
Roof, shale and bone.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal	1 3½	1 9½	1 6	1 6½
"Mother coal"	1/8	1/4	1/8	1/8
Coal	5½	10	1 2½	1 1
"Mother coal"	1/4	.. ..	.. ..	.. ..
Coal	7½	.. ..	.. ..	.. ..
Shale	a 1½	a 2	a 1½	a 1¼
Coal	1 2½	1 1/2	1 2	1 3
Floor, shale with clay underlying it.				
Thickness of bed	3 8⅞	3 10¼	4 1/8	3 11⅞
Thickness of coal sampled	3 7⅜	3 8¼	3 10⅜	3 10⅜

a Not included in sample.

Section A (sample 20273) was cut 120 feet from face of old slope opposite 8 right heading, 3,040 feet N. 60° W. of slope mouth. Section B (sample 20277) was cut 15 feet from face of 1 left entry, main (old) slope, 1,650 feet N. 80° W. of slope mouth. Section C (sample 20278) was cut 20 feet from face of new slope, 1,950 feet north of slope mouth. Section D (sample 20279) was cut 5 feet from face of 6 room, 1 right entry, new slope, 1,600 feet N. 20° E. of slope mouth.

The ultimate analysis of a composite sample made by combining face samples 20273, 20277, 20278, and 20279 is given under laboratory No. 20280.

Wilmore No. 3 mine is opened by two slopes, one branching from the other, and is worked by the room-and-pillar system. In 1914 the coal was mined with picks and shot down with black blasting powder. Material from the roof and floor did not become mixed with the coal in mining. Practically all the coal was shipped as run of mine, although some was screened by grate bars. The tracks had a capacity of 10 loaded and 10 empty railroad cars. About 1,600 acres of coal was unmined. The probable lifetime of the mine was estimated to be 50 years. The greater part of the future output was to be derived from advance work. In 1914 the daily capacity of the mine was 250 tons. The output was to be increased to 1,500 tons.

Johnstown. Smokeless No. 1 Mine.

Analyses 22430 to 22433 (pp. 73–74). Semibituminous coal, Windber field, from Smokeless No. 1 mine, a slope mine 2 miles south of Johnstown, at Ferndale, on the Baltimore & Ohio R. R. Coal bed, Upper Kittanning or C′; Carboniferous age, Allegheny formation. The bed is locally known as the "cement" coal, from the exceptionally hard, gritty shale underneath it. The coal averages 3 feet 8 inches thick; it is overlain by bony coal 4 to 6 inches thick, above which is gray shale; the floor is hard rough shale. The bed was sampled by H. D. Mason, jr., and W. J. German on June 7, 1915, as described below:

Sections of coal bed in Smokeless No. 1 Mine.

Section	A	B	C
Laboratory No	22430	22431	22432
	Ft. in.	Ft. in.	Ft. in.
Roof, gray shale			
Bony coal	[a] 5	[a] 6	[a] 5
Soft coal	1 5	1 6	1 8
Shale band	.. ..	[a] ½	.. ..
Hard coal	2 3	2 1	2 0
Floor, hard rough shale.			
Thickness of bed	4 1	4 1½	4 1
Thickness of coal sampled	3 8	3 7	3 8

[a] Not included in sample.

Section A (sample 22430) was cut at face of 2 left entry, main dip entry, 2,200 feet from slope mouth. Section B (sample 22431) was cut at face of 2 right entry, main dip entry, 2,850 feet from slope mouth. Section C (sample 22432) was cut at face of 2 crosscut, 3 room, 2 right entry, 1,680 feet from slope mouth.

The ultimate analysis of a composite sample made by combining face samples 22430 to 22432 is given under laboratory No. 22433.

The mine was opened in 1910. It is opened by a slope 400 feet long on a 17° pitch, the workings being fairly level at the bottom of this slope, and is worked on the double-entry, room-and-pillar system. No pillars have been nor will be drawn as the surface land is too valuable, constituting the suburb of Ferndale. In 1915 all undercutting was by hand; permissible explosives were used exclusively, the shooting being done by the miners during the shift. The daily output was about 350 tons.

Llanfair. Scalp Level No. 2 Mine.

Analyses 20299 and 20413 to 20416 (p. 74). Semibituminous coal, Windber field, from Scalp Level No. mine, a shaft mine 60 feet deep, 1 mile south of Llanfair, Adams Township, with railroad connections to the South Fork branch of the Pennsylvania

R. R. Coal bed said to be Miller or B; Carboniferous age, Allegheny formation. Average thickness, 3½ feet; dip, 1° SW.; roof, hard black shale, fairly smooth surface; floor, clay, with smooth surface. Thickness of cover, about 70 feet. The bed was sampled by D. J. Parker, December 2, 1914, and by E. H. Denny on December 13, 1914, as described below:

Sections of coal bed in Scalp Level No. 2 mine.

Section	A	B	C	D
Laboratory No.	20299	20413	20414	20415
Roof, black shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	3 5	3 6½	1 9½	6
"Mother coal"	.. ..	.. ..	1/16	¼
Coal	.. ..	.. ..	1 11	2 8¼
Floor, clay.				
Thickness of bed	3 5	3 6½	3 8 9/16	3 2½
Thickness of coal sampled	3 5	3 6½	3 8 9/16	3 2½

Section A (sample 20299) was cut at the rib of main car return entry connecting air and hoisting shafts, 160 feet N. 60° E. of air shaft. Section B (sample 20413) was cut on the south rib, 110 feet from face of 1 east entry, 240 feet S. 30° E. of air shaft. Section C (sample 20414) was cut on north rib, 15 feet from face of drift driven to connect with old workings, 110 feet N. 30° W. of air shaft. Section D (sample 20415) was cut at face of the loaded track haul, 90 feet N. 10° W. of air shaft.

An ultimate analysis of a composite sample made by combining samples 20299, 20413, 20414, and 20415 is given under laboratory No. 20416.

Scalp Level No. 2 mine had been opened only a month at the time of sampling. It is worked by the room-and-pillar system. No development had been made by driving main or cross entries, rooms, etc. The coal was shot down with black blasting powder. All of the coal was shipped as run-of-mine. The tracks had a capacity of 20 loaded and 20 empty cars. There was 500 to 600 acres yet unmined. Output in 1914 was 150 tons daily, which was to be greatly increased. Electric coal-cutting machines were to be installed.

Nanty Glo. Lincoln No. 1 Mine.

Analyses 22514 to 22520 (p. 74). Semibituminous coal, Windber field, from Lincoln No. 1 mine, a drift mine about 1 mile northeast of Nanty Glo, on the Black Lick branch of the Pennsylvania R. R. and on the New York Central R. R. Coal bed, said to be the B, Miller, or Lower Kittanning; Carboniferous age, Allegheny formation. Average thickness, about 3½ feet; dip, 2½ per cent east. Roof, hard gray shale overlain by sandstone; floor, hard firm underclay. The bed was sampled by E. H. Denny on July 3, 1915, as described below:

Sections of coal bed in Lincoln No. 1 mine.

Section	A	B	C	D	E	F
Laboratory No.	22514	22515	22516	22517	22518	22519
Roof, shale overlain with sandstone.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	.. ..	.. ..	1½	.. ..	.. ..	.. ..
"Sulphur"	.. ..	.. ..	1/16	.. ..	.. ..	.. ..
Coal	.. ..	.. ..	3½	.. ..	.. ..	.. ..
"Sulphur"	.. ..	.. ..	*a* 5/8	.. ..	.. ..	.. ..
Coal, hard flinty	1 ½	9½	6½	11	11	10½
Coal or "binder"	1	½	1	½	½	¾
Coal	1 10	1 0	11	2 5	2 7½	2 6¾
"Sulphur"	1/16	*a* 5/8	1/16	.. ..	.. ..	.. ..
Coal	1	8½	1 10	.. ..	.. ..	.. ..
Floor, hard firm underclay.						
Thickness of bed	3 8 9/16	3 7½	3 10	3 4½	3 7	3 6
Thickness of coal sampled	3 8 9/16	3 6½	3 9⅝	3 4½	3 7	3 6

a Not included in sample.

Section A (sample 22514) was cut on rib, 25 feet from face of "new" main entry, 5,400 feet N. 70° E. of drift mouth. Section B (sample 22515) was cut at face of 7 right heading, "new" main entry, 4,800 feet N. 60° E. of drift mouth. Section C (sample 22516) was cut on rib next to face of 12 room, 20 feet off 4 left heading, 4 right entry, 5,250 feet N. 50° E. of drift mouth. Section D (sample 22517) was cut on the 9 back heading stump, 150 feet off "hill" entry, 5,100 feet N. 30° E. of drift mouth. Section E (sample 22518) was cut at the face of the "McFadden G" heading, 3,800 feet N. 10° E. of drift mouth. Section F (sample 22519) was cut at face of 7 room, 100 feet off "McFadden F" heading, 3,100 feet N. 20° E. of drift mouth.

The ultimate analysis of a composite sample made by combining samples 22514 to 22519 is given under laboratory No. 22520.

A car of 35 tons of coal from this mine was also sampled. For the results of analysis, see laboratory No. 22521.

The mine is worked by the room-and-pillar system. In 1915 the coal was undercut by machine and shot down with black powder. The coal is soft. Material from the roof and floor did not become mixed with the coal in mining. The lump coal on cars is fairly large. Coal was sent over automatic screen and picking table.

The tracks had a capacity of 25 empty and 22 loaded cars. The probable lifetime of the mine was 30 years. About 80 per cent of the future output was to be derived from advance work. Daily output, about 800 tons.

Nanty Glo. Springfield No. 1 Mine.

Analyses W46483, W46484, W46486 to W46490, and 19579 (p. 75). Semibituminous coal, Windber field, from Springfield No. 1 mine, a slope mine, one-half mile southeast of Nanty Glo on the Black Lick branch of the Cresson division of the Pennsylvania R. R. Coal bed, Lower Kittanning or B; Carboniferous age, Allegheny formation. Average thickness, 3 feet 7 inches, varying from 3 feet 5 inches to 3 feet 10 inches. Roof, firm shale, overlain by sandstone about 22 feet thick; floor, soft shale, generally smooth. Particles of the floor become mixed with the coal in mining. There are small soft "sulphur" lenses throughout the coal bed. The bed was sampled by P. M. Riefkin on June 8, 1914, as described below:

Sections of coal bed in Springfield No. 1 mine.

Section	A	B	C	D	E	F	G
Laboratory No	W46483	W46484	W46486	W46487	W46488	W46489	W46490
Roof, sandstone, shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	2 ½	2 1	7	3 9	2 8	2 3	3 6
"Sulphur" soft	*a* ¼	.. ..	Streak.	.. ..	Streak.	*a* ½	.. ..
Coal, very soft, with a number of soft "sulphur" lenses	1 6½	1 5	3 ½	.. ..	9½	1 2½	.. ..
Floor, shale.							
Thickness of bed	3 7¼	3 6	3 7½	3 9	3 5½	3 6	3 6
Thickness of coal sampled	3 7	3 6	3 7½	3 9	3 5½	3 5½	3 6

a Not included in sample.

Section A (sample W46483) was cut in 9 room, 9 left heading, 4,700 feet from slope mouth. Section B (sample W46484) was cut from rib in 12 room, 8 left heading, 4,400 feet from slope mouth. Section C (sample W46486) was cut in 6 room, 7 slant heading, 7 left heading, 5,000 feet from slope mouth. Section D (sample W46487) was cut 300 feet off 9 left heading parallel with main heading, 4,600 feet from slope mouth. Section E (sample W46488) was cut 15 feet from face of 4 left heading, main heading, 5,100 feet from slope mouth. Section F (sample W46489) was cut 100 feet on rib from face of 7 left heading, 5,200 feet from slope mouth. Section G (sample W46490) was cut from face of 30 room, 3 left heading, main heading, 4,700 feet from slope mouth.

An ultimate analysis of a composite sample made by mixing samples W46483, W46484, and W46486 to W46490 is given under laboratory No. 19579.

In 1914 the coal was undercut in the bottom part of the bed with short-wall coal-cutting machines and shot down with black powder. The tipple had one loading track with a capacity of 21 empty and 21 loaded cars. The entire output was shipped as run-of-mine. The coal is very soft and only a small percentage of the loadings is lump coal. The mine is on a syncline and is opened by a steep slope 420 feet long. The bed is slightly rolling, there being three or four swamps on the main entry. The dip entry turns to the right and has considerable water in it. The high parts of the mine are dry. The mine had a capacity of 950 tons and an average daily output of 750 tons, derived entirely from advance work. There was approximately 1,800 acres of unmined coal. The probable lifetime of the mine was 50 years.

For analyses and descriptions of other samples of coal from this mine see Bureau of Mines, Bull. 85, 1914, pp. 78, 79, 276, 277.

Portage. Trout Run No. 5 Mine.

Analyses W46811 to W46815, and 19610 (p. 75). Semibituminous coal, Windber field, from Trout Run No. 5 mine, a slope mine, 1½ miles southeast of Portage on the main line of the Pennsylvania R. R. Coal bed, Upper Freeport or E; Carboniferous age, Allegheny formation. The coal is fairly uniform in thickness except where partly cut out by the sandstone cap rock. The bed ranges from 8 inches to 5 feet, averaging about 4 feet 3 inches. The coal is clean with the exception of 1 foot of bony coal at the top and a shale parting about 1 foot from the bottom. Roof, shale, which in places is cut out by sandstone cap rock; floor, soft clay under 2 to 4 inches of hard shale. Cover at the points of sampling, 180 to 200 feet thick. The bed was sampled by H. I. Smith on June 27, 1914, as described below:

Sections of coal bed in Trout Run No. 5 mine.

Section	A	B	C	D	E
Laboratory No.	W46814	W46811	W46815	W46813	W46812
Roof, shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Bone	[a] 1 0	[a] 3½	[a] 1 0	-- --	-- --
Coal, gray	6½	3	4	4	7
Coal	-- --	-- --	9	-- --	1 2½
"Mother coal" and "sulphur"	-- --	-- --	½	-- --	½
Coal	2 2	2 5	1 5¾	2 3	1 2
Coal, hard, gray	-- --	-- --	-- --	6	-- --
Shale	[a] 1	[a] 1	[a] 1½	[a] 1½	[a] 1
Coal	-- --	-- --	4½	-- --	9
"Mother coal"	-- --	-- --	½	-- --	Streak.
Coal	1 1½	1 2½	11½	1 3	6
Floor, soft clay under 2 to 4 inches of hard shale.					
Thickness of bed	4 11	4 3	5 ¾	4 5½	4 4
Thickness of coal sampled	3 10	3 10½	3 11½	4 4	4 3

[a] Not included in sample.

Section A (sample W46814) was measured at face of 3 left air course, opposite 15 room, 2,500 feet northeast of slope mouth. Section B (sample W46811) was measured at face of 9 room, 230 feet from 3 left heading, 1,900 feet northeast of slope mouth. Section C (sample W46815) was measured at face of 2 right heading, opposite 13 room, 1,000 feet east of slope mouth. Section D (sample W46813) was measured at face of 26 room, 30 feet off 2 left heading, 2,500 feet northeast of slope mouth. Section E (sample W46812) was measured at face of 3 room, 1 right heading, 700 feet northeast of slope mouth.

The ultimate analysis of a composite sample made by combining samples W46811 to W46815 is given under laboratory No. 19610.

The mine is opened by a slope 400 feet long and operated on the room-and-pillar system. In 1914 the coal was undercut by short-wall machines and by hand, and was

shot down with black blasting powder. After the coal was loaded the bony coal from the top was taken down to give height and was gobbed. The entire output was shipped run of mine. Two pickers are employed on the car. The coal is of bright appearance on the car. The track capacity was 30 empty and 25 loaded cars. The average daily output was 300 tons; maximum day's run, 347 tons.

CENTER COUNTY.

CLARENCE. No. 22 MINE.

Analysis 17447 (p. 75). Bituminous coal, Windber field, from No. 22 mine, 1½ miles northwest of Clarence, on the Pennsylvania R. R. Coal bed, Brookville or Lower A; Carboniferous age, Allegheny formation. Thickness 5 feet. The bed was sampled by M. A. Pishel on May 31, 1913, as described below:

Section of coal bed in No. 22 mine.

	Ft.	in.
Roof, bony coal and clay.		
Coal	3	2½
Clay	[a]	1½
Coal		8
Floor, not stated.		
Thickness of bed	3	0
Thickness of coal sampled	3	10½

[a] Not included in sample.

The sample was taken in the main entry, three-fourths mile from the mine mouth.

CLARENCE. POORMANSITE MINE.

Analyses 17444 and 17445 (p. 75). Bituminous coal and semibituminous coal, Windber field, from Poormansite mine, a drift mine in Snowshoe Township, 1½ miles northeast of Clarence, on the Pennsylvania R. R. Coal beds, B or Lower Kittanning, and D or Lower Freeport; Carboniferous age, Allegheny formation. Thickness of beds: B, 3 feet 9 inches; D, 5 feet 11 inches. The beds were sampled by M. A. Pishel on May 31, 1913, as described below:

Section of B bed in Poormansite mine.

Laboratory No	17444
	Ft. in.
Roof, not stated.	
Coal	8
Bone	[a] 3
Coal	2 10
Floor, not stated.	
Thickness of bed	3 9
Thickness of coal sampled	3 6

[a] Not included in sample.

Sample 17444 was taken in side entry, about 1,000 feet from mine mouth.

Section of D bed in Poormansite mine.

Laboratory No	17445
	Ft. in.
Roof, not stated.	
Coal	7
Bone	[a] 10
Coal	2 6
Floor, not stated.	
Thickness of bed	5 11
Thickness of coal sampled	5 1

[a] Not included in sample.

Sample 17445 was taken in side entry about 600 feet from mine mouth. Daily production in B bed 60 tons; D bed, 50 tons.

GILLINGTOWN. No. 15 MINE.

Analysis 17446 (p. 75). Bituminous coal, Windber field, from No. 15 mine, in Snowshoe Township about one-half mile northeast of Gillingtown. Coal bed, Lower Freeport or D; Carboniferous age, Allegheny formation. Thickness, 3½ feet. The bed was sampled by M. A. Pishel on May 31, 1913, as described below:

Section of coal bed in No. 15 mine.

	Ft.	in.
Roof, not stated.		
Coal, bony	[a]	10
Coal	1	6
Coal, bony	[a]	2
Coal	1	0
Floor, not stated.		
Thickness of bed	3	6
Thickness of coal sampled	2	6

[a] Not included in sample.

The sample was taken in main entry, 500 feet from mine mouth.

CLEARFIELD COUNTY.

BERWINDALE. REED MINE.

Analyses 22535 to 22540 (p. 76). Bituminous coal, Windber field, from Reed mine, a slope mine in Jordan Township, one-half mile southeast of Berwindale, on the Bellwood branch of the Pennsylvania R. R. Coal bed said to be D, Moshannon, or Lower Freeport; Carboniferous age, Allegheny formation. The coal is fairly hard. Bed is about 3 feet 9 inches thick, and lies practically flat. Roof, fine-grained sandstone; floor, firm, hard under-clay. Material from the roof and floor did not become mixed with the coal in mining. The bed was sampled by E. H. Denny and G. E. McElroy, on July 9, 1915, as described below:

Sections of coal bed in Reed mine.

Section	A	B	C	D	E
Laboratory No.	22535	22536	22537	22536	22539
Roof, fine-grained sandstone.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Bony coal and "sulphur"	[a]1	.. ..	[a]1	[a]1	[a]½
Coal	2¾	1½	3	10	5
"Sulphur"	1/16	1/16	[a]½	.. ..	¼
Coal	1½	1	.. ..	.. ..	.. ..
"Sulphur"	1/16	1/16	.. ..	.. ..	.. ..
Coal	1½	3	.. ..	.. ..	.. ..
"Sulphur"	1/16	1/16	.. ..	⅛	.. ..
Coal	7¼	1	.. ..	.. ..	.. ..
"Sulphur"	[a]1½	1/16	.. ..	.. ..	.. ..
Coal	10	5¼	.. ..	.. ..	1⅛
"Sulphur"	1/16	1/16	.. ..	.. ..	⅛
Coal	.. ..	5½	5½	10	7½
"Sulphur"	.. ..	1/16	¼	⅛	[a]½
Coal	.. ..	6½	11	5	6½
Cannel coal	½	1½	½	½	½
Coal	9	4½	2	10	4
"Sulphur"	[a]½	1/16	⅛	⅛	⅛
Coal	7	3½	8⅜	4	5
"Sulphur"	1/16	⅛	.. ..	.. ..	[a]½
Coal	10	½	.. ..	[b]4	1½
Floor, hard firm underclay.					
Thickness of coal bed	4 4¾	3 10 5/16	2 8½	3 8⅞	2 9
Thickness of coal sampled	4 1¼	3 10 5/16	2 7	3 7⅞	2 7½

[a] Not included in sample. [b] Hard, bright bottom coal.

Section A (sample 22535) was measured at face of 4 left heading, 1,800 feet S. 45° E. of slope mouth. Section B (sample 22536) was measured at face of a room 150 feet from 4 left entry, 1,400 feet S. 45° E. of slope mouth. Section C (sample 22537) was measured at face of 3 right back heading, 1,800 feet S. 30° W. of slope mouth. Section D (sample 22538) was measured at face of 4 right heading, 2,200 feet N. 45° W. of slope mouth. Section E (sample 22539) was measured at face of 4 right butt, 4 right heading, 1,800 feet N. 30° W. of slope mouth.

An ultimate analysis of a composite sample made by combining samples 22535 to 22539 is given under laboratory No. 22540.

The mine is worked by the room-and-pillar system. In 1915 the coal was mined by machine and shot down with black powder. All of the coal was shipped as run of mine. The lump coal on the cars was rather large lump. There was one loading track with a capacity of 7 empty and 10 loaded cars. One trimmer was employed on the car. Approximately 2,000 acres was yet to be mined from the slope opening, making the lifetime of the mine at the rate of working in 1915, 50 to 100 years. All of the future output under the present system of working was to come from advance work, as the pillars were not being pulled. The daily capacity of the mine was 225 tons.

Blain City. Irvona No. 5 Mine.

Analyses W17058, W17059, and 11703 (p. 76). Semibituminous coal, Windber field, from Irvona No. 5 mine, a drift mine one-fourth mile east of Blain City on the Pennsylvania R. R. Coal bed, Miller or B; Carboniferous age, Allegheny formation. Roof, shale one-fourth to one-half inch thick overlain by black rock; floor, clay. The bed was sampled by P. M. Riefkin on January 25, 1911, as described below:

Sections of coal bed in Irvona No. 5 mine.

Section	A	B
Laboratory No.	W17058	W17059.
Roof, shale and black rock.	Ft. in	Ft. in.
Coal, bony	-- --	a 3
Coal	1 7½	1 2
Coal, bony	a 11½	a 7½
Coal	1 0	1 1
Coal, bony	-- --	a 7/8
Shale	a ½	-- --
Coal	1 2	1 3¼
Floor, clay.		
Thickness of bed	4 9½	4 5⅝
Thickness of coal sampled	3 9¼	3 6¼

a Not included in sample.

Section A (sample W17058) was measured on 3 pillar to the right in Peacock section. Section B (sample W17059) was measured at face of 3 room, Rosser heading.

An ultimate analysis of a composite sample made by mixing samples W17058 and W17059 is shown under laboratory No. 11703.

Carnwath. Carnwath No. 1 Mine.

Analyses 20342, 20343, 20494, 20495, and 20496 (pp. 76–77). Bituminous coal, Windber field, from Carnwath No. 1 mine, a drift mine, at Carnwath on Potts Run branch of the New York Central R. R. Coal bed, Moshannon or D; Carboniferous age, Allegheny formation. Thickness of bed, 2 feet 10 inches to 3 feet 10 inches. Roof, shale, and 1 inch of bony coal; floor, soft clay; dip, 1° to 1½° S. The bed was sampled by E. H. Denny, on December 4, 1914, as described on page following.

Sections of coal bed in Carnwath No. 1 mine.

Section	A	B	C	D	E
Laboratory No.	20342	20343	20494	20495	20496
Roof, shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal	1 9½	12	8¼	5	11⅛
"Mother coal"	.. ..	¼	1/16	1/16	1/16
Bone	1/4	.. ..	.. ..	.. ..	.. ..
Coal	1 4½	11¼	1 0	1 0	7½
Shale	.. ..	3/16		¼	3/16
Coal	.. ..	1 9	9½	1 0	1 2½
"Mother coal"	.. ..	.. ..	¼	¼	.. ..
Coal	.. ..	.. ..	8½	4	.. ..
Floor, clay.					
Thickness of bed	3 2¼	3 8¾	3 2½	2 9 9/16	2 9¾
Thickness of coal sampled	3 2¼	3 8¾	3 2½	2 9 9/16	2 9¾

Section A (sample 20342) from face of 7 room, 3 right entry, 75 feet from face of entry, 2,100 feet N. 30° W. of drift mouth. Section B (sample 20343) was cut from face of 2 left entry, 1 left entry, 2,400 feet east of drift mouth. Section C (sample 20494) was cut from west rib of 1 room, 2 left back heading, 3,550 feet N. 40° E. of drift mouth. Section D (sample 20495) was cut at 1 crosscut, 2 room, 2 right heading, 2 left entry, 3,750 feet N. 40° W. of drift mouth. Section E (sample 20496) was cut from west rib of 7 room, 1 right heading, 2 left entry, 3,700 feet N. 45° E. of drift mouth.

An ultimate analysis of a composite sample made by combining samples 20342 and 20343 is given under laboratory No. 20346.

The room-and-pillar system of mining is used. In 1914 the coal was undercut by hand, and shot down with black blasting powder during the shift, by the miners. The output was about 350 tons a day, half of which came from advance workings. About 80 per cent of the coal was recovered. All of the coal was shipped as run of mine. There was one loading track with a capacity of 25 empty and 19 loaded cars. The lifetime of the mine was probably about two years. There was 35 acres still unmined.

Carnwath. Carnwath No. 2 Mine.

Analyses 20338 to 20341 (p. 77). Bituminous coal, Windber field, from Carnwath No. 2 mine, a drift mine, in Jordan Township, 2¼ miles southwest of Carnwath, on the Potts Run branch of the New York Central R. R. Coal bed said to be D or Moshannon; Carboniferous age, Allegheny formation. Bed averages 3 feet thick and lies practically flat. Roof, shale; floor, soft smooth clay, from which the coal parts readily. Material from the roof and floor did not become mixed with the coal in mining. Cover at points of sampling, 70 to 165 feet. The bed was sampled by E. H. Denny on December 4, 1914, as described below:

Sections of coal bed in Carnwath No. 2 mine.

Section	A	B	C	D
Laboratory No.	20338	20339	20340	20341
Roof, shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal	8½	4¾	11½	8
"Sulphur"	8	.. ..	¼	.. ..
"Mother coal"	.. ..	½	.. ..	¼
Coal	1	5⅝	7	1½
"Mother coal"	⅛	.. ..	.. ..	.. ..
"Sulphur"	.. ..	⅛	.. ..	⅛
Cannel coal	.. ..	.. ..	¾	.. ..
Coal	7¾	7½	1 ½	6
Cannel coal	¾	½	.. ..	¼
"Mother coal"	.. ..	.. ..	¼	.. ..
Coal	1 6	1 9	5½	1 3½
Floor, clay.				
Thickness of bed	3 ¼	3 4⅛	3 1⅜	2 7⅝
Thickness of coal sampled	3 ¼	3 4⅛	3 1¾	2 7⅝

Section A (sample 20338) was cut 20 feet from face of 6 right heading, 1,600 feet N. 65° E. of drift mouth. Section B (sample 20339) was cut in crosscut 5 room, 5 left heading, 1,200 feet N. 55° E. of drift mouth. Section C (sample 20340) was cut at face

of 6 room, 4 right heading, 1,200 feet S. 80° E. of drift mouth. Section D (sample 20347) was cut near face of 1 left heading, 700 feet N. 40° W. of drift mouth.

An ultimate analysis of a composite sample made by combining samples 20338 to 20341 is given under laboratory No. 20344.

The mine is worked by the room-and-pillar system. In 1914 the coal was undercut by short-wall electric-driven machines, and also by hand. Black blasting powder was used in both coal and shale. The room pillars were pulled as fast as the rooms were driven up. All of the coal was shipped as run of mine. The loading track had a capacity for 30 empty and 25 loaded railroad cars. The probable life of the mine was about 12 years. The output in 1914 was 550 tons per day with a maximum day's run of about 600 tons. The future output was to be derived almost entirely from advance work and was to be increased.

Coalport. Irvona No. 10 Mine.

Analyses W17056, W17057, and 11702 (p. 77). Semibituminous coal, Windber field, from Irvona No. 10 mine, a drift mine 2½ miles east of Coalport, on the Pennsylvania R. R. Coal bed, Miller or B; Carboniferous age, Allegheny formation. The bed was sampled by G. S Pope on January 25, 1911, as described below:

Sections of coal bed in Irvona No. 10 mine.

Section	A	B
Laboratory No.	W17056	W17057
Roof, not stated.	*Ft. in.*	*Ft. in.*
Coal	2	1 9½
"Sulphur"	¼	-- --
Soft bone	-- --	[a] 3¾
Coal	1 6¾	-- --
Soft band	[a] 3	-- --
Shale	[a] 6½	[a] 2
Hard bone	-- --	[a] 1¾
Coal	11½	1 ¼
Bone (black "sulphur" in middle)	-- --	¾
Shale	[a] ¾	-- --
Coal	1 5	1 1¼
Floor, not stated.		
Thickness of bed	4 11½	4 7½
Thickness of coal sampled	4 1¼	3 11¾

[a] Not included in sample.

Section A (sample W17056) was measured at 2 right entry, main heading. Section B (sample W17057) was measured at 10 face entry, 500 feet off 5 left entry.

An ultimate analysis of a composite sample made by mixing face samples W17056 and W17057 is shown under laboratory No. 11702.

Dubois. Eriton Mine.

Analysis 17443 (p. 77). Bituminous coal, Punxsutawney field, from Eriton mine, a shaft mine 3½ miles south of Dubois, on the Buffalo, Rochester & Pittsburgh Ry.

Coal bed, Lower Freeport or D; Carboniferous age, Allegheny formation. Thickness, 7 feet 8½ inches. The bed was sampled by M. A. Pishel on June 5, 1913, as described below:

Section of coal bed in Eriton mine.

	Ft. in.
Roof, not stated.	
Coal, bony	[a] 1 6
Coal	5 5
Shale	[a] 1½
Coal	8
Floor, not stated.	
Thickness of bed	7 8½
Thickness of coal sampled	6 1

[a] Not included in sample.

The sample was taken in the mine at a point 200 feet southwest of shaft.

Houtzdale. Mountain Branch Mine.

Analyses W46816 to W46820, and 19615 (p. 77). Bituminous and semibituminous coal, Windber field, from Mountain Branch mine, a drift mine 2 miles south of Houtzdale, on a branch of the Pennsylvania R. R. Coal bed, Brookville or A; Carboniferous age, Allegheny formation. Average thickness about 5 feet. The coal has no well-defined cleavage planes for mining; 14 inches of bony coal are left as roof; immediately above this is a strong sandstone; the floor is hard clay. Cover at points of sampling, 100 to 200 feet. The bed was sampled by J. R. Fleming on June 27, 1914, as described below:

Sections of coal bed in Mountain Branch mine.

Section	A	B	C	D	E
Laboratory No.	W46818	W46820	W46816	W46817	W46819
Roof, sandstone	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Bone	[a] 4	[a] 3	[a] 1	.. ..	[a] 1
Coal	8	4	3	9½	9
"Sulphur"	.. ..	½	Streak.	¼	.. ..
Coal, with several thin streaks of "sulphur"	.. ..	4	6½	.. ..	.. ..
Bone	½	¾	¾	.. ..	1
Coal	3	.. ..	.. ..	.. ..	6½
"Sulphur"	Streak.	.. ..	.. ..	.. ..	Streak.
Coal	3	6¼	6½	.. ..	1½
"Sulphur" band	[a] 1	[a] 2	[a] 1	.. ..	[a] 1
Coal	6½	6	.. ..	1 9½	10
"Sulphur"	Streak.	Streak.	.. ..	.. ..	.. ..
Coal	7	4	1 0	.. ..	.. ..
"Shale" binder	[a] 1	[a] 1	[a] 1½	[a] 1	[a] 1
Coal, with several thin streaks of "sulphur"	.. ..	5	1 3	.. ..	5
Coal	7	10	.. ..	1 2	5
"Sulphur"	Streak.	Streak.	.. ..	.. ..	Streak.
Soft shale parting	.. ..	.. ..	.. ..	1	.. ..
Coal, soft, with several streaks of soft shale	.. ..	.. ..	.. ..	4	.. ..
Coal	1 9½	6½	9	1 2	1 4
Floor, hard sandy clay.					
Thickness of bed	5 2½	4 5	4 8	5 5½	4 9
Thickness of coal sampled	4 8½	3 11	4 4¾	5 4¼	4 6

[a] Not included in sample.

Section A (sample W4618) was measured at face of 1 dip heading, 1 left heading, 1,000 feet east of mine mouth. Section B (sample W46820) was measured at face of last room, 1 left heading, 1,450 feet southeast of the mine mouth. Section C (sample W46816) was measured at face of 2 left heading, 1,350 feet southeast of mine mouth. Section D (sample W46817) was measured at face of main heading, 1,350 feet southeast of mine mouth. Section E (sample W46819) was measured at face of 3 left heading, 1,400 feet southeast of mine mouth.

An ultimate analysis of a composite sample made by mixing face samples W46816 to W46820 is shown under laboratory No. 19615.

The coal is mined by the room-and-pillar system. In 1914 the coal was undercut by hand, and broken down with black blasting powder. The entire output was shipped as run of mine. One picker was employed at the tipple. "Sulphur" bands and lenses were numerous. The coal when first loaded on the cars had a bright appearance. The lumps were fairly large and hard. The pyrite in this coal seems to weather rapidly when exposed to air and moisture, causing a white efflorescence on the surface exposed. The mine had an average output of 200 tons per day. There was 300 acres of solid coal available.

Karthaus. Horseshoe Mine.

Analysis 17441 (p. 77). Bituminous coal, Windber field, from Horseshoe mine, one-half mile south of the station at Karthaus, on the New York Central & Hudson River R. R. Coal bed, B or Lower Kittanning; Carboniferous age, Allegheny formation. Thickness, 3 feet 10½ inches. The bed was sampled by M. A. Pishel on June 2, 1913, as described on page following.

Section of coal bed in Horseshoe mine.

	Ft.	in.
Roof, not stated.		
Coal, bony		[a] 9
Coal	2	8
Pyrite		[a] ½
Coal		5
Floor, not stated.		
Thickness of bed	3	10½
Thickness of coal sampled	3	1

[a] Not included in sample.

The sample was taken in 3 room, 2 entry, 1,000 feet from mouth of mine.

KARTHAUS. SHINOLA MINE.

Analysis 17442 (p. 77). Semibituminous coal, Windber field, from Shinola mine, near Karthaus, on the New York Central & Hudson River R. R. Coal bed, Brookville or A; Carboniferous age, Allegheny formation. Thickness, 3 feet 11 inches. The bed was sampled by M. A. Pishel on June 2, 1913, as described below:

Section of coal bed in Shinola mine.

	Ft.	in.
Roof, not stated.		
Coal	1	6
Coal, bony		[a] 4
Coal	1	8
Coal, bony		[a] 5
Floor, not stated.		
Thickness of bed	3	11
Thickness of coal sampled	3	2

[a] Not included in sample.

The sample was taken in the main entry, 600 feet from mine mouth.

ELK COUNTY.

BRANDY CAMP. ELBON NO. 5 MINE.

Analysis 17458 (p. 77). Bituminous coal, Clarion field, from Elbon No. 5 mine, in Fox Township, on the Pittsburgh, Shawmut & Northern R. R. Coal bed, Lower Kittanning or B; Carboniferous age, Allegheny formation. Thickness, 3 feet. The bed was sampled by M. A. Pishel on June 4, 1913, as described below:

Section of coal bed in Elbon No. 5 mine.

	Ft.	in.
Roof, not noted.		
Coal	1	9
Mineral charcoal		½
Coal	1	2
Floor, not noted.		
Thickness of bed	2	11½
Thickness of coal sampled	2	11½

The sample was taken in 1 left entry, 4 drift. 1.000 feet from mine mouth.

BYRNEDALE. BYRNEDALE NO. 31 MINE.

Analysis 17456 (p. 77). Bituminous coal, Clarion field, from Byrnedale No. 31 mine, in Jay Township, at Byrnedale, on Pittsburgh, Shawmut & Northern R. R. Coal bed, Lower Kittanning or B; Carboniferous age, Allegheny formation. Thickness, 3½ feet. The bed was sampled by M. A. Pishel on June 3, 1913, as described on page following.

Section of coal bed in Byrnedale No. 31 mine.

	Ft.	in.
Roof, not noted.		
Coal, bony		[a] 4
Coal	2	10
Pyrite		[a] ½
Coal		4
Floor, not noted.		
Thickness of bed	3	6½
Thickness of coal sampled	3	2

[a] Not included in sample.

The sample was taken in 1 left entry, main entry, 600 feet from mine mouth. The daily output of the mine was about 500 tons.

Dagus. Dagus Mine.

Analysis 17455 (p. 78). Bituminous coal, Clarion field, from Dagus mine, a drift mine in Fox Township at Dagus, 1 mile from the Pittsburgh, Shawmut & Northern R. R. Coal bed, Lower Kittanning or B; Carboniferous age, Allegheny formation. Thickness, 3½ feet. The bed was sampled by M. A. Pishel on June 4, 1913, as described below:

Section of coal bed in Dagus mine.

	Ft.	in.
Roof, not noted.		
Coal, bony		[a] 1½
Coal, good	2	0
Pyrite		[a] ½
Coal	1	6
Floor, not noted.		
Thickness of bed	3	7¾
Thickness of coal sampled	3	6

[a] Not included in sample.

The sample was taken in room, 1 right face entry, 1 mile from mine mouth. The daily output of the mine was 1,600 tons.

Wilmere. Dents Run No. 1 Mine.

Analysis 17457 (p. 78). Bituminous coal, Clarion field, from Dents Run No. 1 mine, a drift(?) mine in Benezette Township at Wilmere, 7 miles from the Pennsylvania R. R., on the Dents Run R. R. and the Buffalo & Susquehanna R. R. Coal bed, Lower Kittanning or B; Carboniferous age, Allegheny formation. Thickness, 4 feet 3½ inches. The bed was sampled by M. A. Pishel on June 3, 1913, as described below:

Section of coal bed in Dents Run No. 1 mine.

	Ft.	in.
Roof, not noted.		
Bony coal		[a] 10
Clay		[a] 1½
Coal		[a] 2
Clay		[a] 7
Coal	2	7
Floor, not noted.		
Thickness of bed	4	3½
Thickness of coal sampled	2	7

[a] Not included in sample.

The sample was taken in 4 left entry, 600 feet from mine mouth. The daily output of the mine was 600 tons.

FAYETTE COUNTY.

East Millsboro. Hustead Mine.

Analyses 23093 to 23097 (p. 78). Bituminous coal, Pittsburgh field, from Hustead mine, a slope mine at East Millsboro, on the Monongahela River and the Monongahela R. R. Coal bed, Pittsburgh; Carboniferous age, Monongahela formation. The Pitts-

burgh bed at this point lies lower than the bed of the river. Thickness, 6 feet 3 inches to 7 feet. The bed has the characteristic "sulphur" bands about 30 inches from the bottom, and "draw slate" 8 to 12 inches thick overlying the coal. Above the "draw slate" is a top coal 12 to 18 inches thick, interspersed with shale bands of varying thickness, and above this is the main roof consisting of hard shale and sandstone. The "draw slate" is taken down by the miner after the coal has been removed. The coal is underlain by hard, dark clay. The coal lies fairly level although there are many local swamps, causing changes in elevation. The bed was sampled by H. D. Mason, jr., and G. E. McElroy on October 22, 1915, as described below:

Sections of coal bed in Hustead mine.

Section	A		B		C		D	
Laboratory No.	23093		23094		23095		23096	
Roof, "draw slate" and coal.	Ft.	in.	Ft.	in.	Ft.	in.	Ft.	in.
Shale, black		½		¼		1½		½
Coal		6		4		10½	1	8
Shale band		½	..	..		½	..	..
"Sulphur" band	..	..		¼	..	..	..	..
Coal, bony	..	..	..	..	..	..		1
Coal	1	2		11½	1	3	2	3
"Mother coal"		½	..	..		¼	..	..
Coal, bony	..	..		a1½	..	..	..	..
Shale band	..	..		½	..	..		a½
Coal	1	6	1	3	1	0		3
"Sulphur" band		a¼	..	..	..	..		a¼
"Mother coal"	..	..		½		½	..	..
Coal		2½		3½		3½		2
"Sulphur" band		a¼		a¼		a¼		a¼
Coal	2	6	1	1		2½	2	2
"Sulphur" band	..	..		a½		a¼	..	..
Coal	..	..		1½	2	4	..	..
Coal, bony	..	..		a1	..	..	..	..
Coal	..	..	2	6	..	..	..	..
Floor, hard dark clay.								
Thickness of bed	6	½	6	11	6	3	6	8½
Thickness of coal sampled	6	0	6	8	6	2¼	6	7½

a Not included in sample.

Section A (sample 23093) was taken at the face of 2 room, 2 butt, 2 right flat entry, main entry, 3,600 feet southeast of slope mouth. Section B (sample 23094) was taken at face of crosscut, 2 right entry, between 1 and 2 butts, 3,500 feet southeast of slope mouth. Section C (sample 23095) was taken at face of 3 left flat entry, 5,800 feet northeast of slope mouth. Section D (sample 23096) was taken at face of 4 left flat parallel, 6,000 feet northeast of slope mouth.

An ultimate analysis of a composite sample made by combining face samples 23093 to 23096 is given under laboratory No. 23097.

The mine is developed on the double-entry, room-and-pillar system. The mains are triple entries and at the time of sampling extended a distance of 5,300 feet from the slope bottom; off the main entries are driven pairs of double entries known as "flats": off these are driven double butt entries from which the rooms are extended. The mine was wet and many pumps were required. There had been little pillar robbing up to the time of sampling, but with the good roof conditions which prevail at least 85 per cent of the coal should be recovered. The roof coal was not mined. The coal was undercut by machine and shot down with permissible explosives by shot firers during the shift. The average daily output in 1915 was about 500 tons, all of which was used in the production of coke. The plant was designed to handle 1,500 tons per day.

For descriptions and analyses of other samples of coal from this mine, see Bureau of Mines Bull. 22, pp. 186, 740, 741.

INDIANA COUNTY.

ERNEST. ERNEST NO. 2 MINE.

Analyses 24191 and 24192 (p. 78). Bituminous coal, Punxsutawney field, from Ernest No. 2 mine, a drift mine at Ernest, 5 miles from Indiana, on the Indiana and Punxsutawney branch of the Buffalo, Rochester & Pittsburgh Ry. Coal bed, Upper Freeport, or E; Carboniferous age, Allegheny formation. Bed averages 5 feet thick. A tough band of bony coal 3 to 9 inches thick occurs 12 inches from the top. Main roof, hard sandstone; floor, hard clay. The bed was sampled by E. H. Denny and A. J. Strane on February 15, 1916, as described below:

Sections of coal bed in Ernest No. 2 mine.

Section	A	B
Laboratory No.	24191	24192
Roof, sandstone.	*Ft. in.*	*Ft. in.*
Coal	4½	1 9
"Sulphur"	⅛	.. ..
Bone	.. ..	a5½
Coal	3½	3½
"Sulphur"	⅛	.. ..
Soft shale	.. ..	¼
Coal	9¾	2 11
Bone and bony coal	a9	.. ..
Coal	1 2½	.. ..
"Sulphur"	½	a⅜
Coal	2½	3
Bone	¼	a2
Coal	2 1½	6
Bone	a1½	.. ..
Coal	7	.. ..
Floor, hard clay.		
Thickness of bed	6 6½	6 4⅝
Thickness of coal sampled	5 8	5 8¾

a Not included in sample.

Section A (sample 24191) was cut from face of 4 room, butt entry, 15 right entry, 4 line entry, 14 right entry. Section B (sample 24192) was cut near face of 2 room, 14½ entry, from inby side of rib stump just inby 1 break-through to 1 room.

The mine was opened in 1903. This mine and No. 3 mine are practically one development and cover an extensive area, the advance faces in 1916 being about 2 miles from the drift mouth. The mine is worked on a triple-entry and double-entry room-and-pillar system. In 1916 the coal was undercut with electric machines, and shot down with black powder and permissible explosives. The daily output averaged over 2,000 tons.

ROBINDALE. ROBINDALE MINE.

Analyses 25135 to 25139 (pp. 78–79). Semibituminous coal, Windber field, from Robindale mine, a drift (?) mine at Robindale, East Wheatfield Township, 1 mile west of Seward, on the Pennsylvania R. R. Coal bed, Miller or B; Carboniferous age, Allegheny formation; thickness, 2½ to 4 feet. Roof, coal and 3 inches of bone, above which is shale; floor, fire clay; maximum dip, 2 per cent. Cover at point of sampling, about 200 feet. The bed was sampled by E. H. Denny and W. J. German on May 16, 1916, as described on page following.

Sections of coal bed in Robindale mine.

Section	A	B	C	D
Laboratory No.	25135	25136	25137	25138
Roof, coal and bone.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal	1 9	10½	5	1 3
"Sulphur"	¼	⅛	¼	.. ..
Coal	9	4	2 5	.. ..
Shale band	.. ..	a¼	.. ..	.. ..
Bony coal	⅛	.. ..	½	.. ..
Bone and "sulphur"	.. ..	.. ..	.. ..	a1
Coal	9	2 2	1 0	1 4
Floor, fire clay.				
Thickness of bed	3 3⅜	3 4⅞	3 10¾	2 8
Thickness of coal sampled	3 3⅜	3 4⅞	3 10¾	2 7

a Not included in sample.

Section A (sample 25135) was cut at face of air course of dip heading. Section B (sample 25136) was cut at face of 1 room, 1 north parallel. Section C (sample 25137) was cut at face of left main heading. Section D (sample 25138) was cut 30 feet from foot of slope at face of proposed drainage way to the dip heading.

An ultimate analysis of a composite sample made by combining face samples 25135 to 25138 is given under laboratory No. 25139.

The coal is mined by the room-and-pillar system. In 1916 the coal was shot down with permissible explosives, which were also used for brushing the floor. The output was 100 tons per day. The coal was not screened. There were two loading tracks with capacity of 25 loaded and 25 empty cars. There were about 1,720 acres of unmined coal tributary to this opening. The estimated lifetime of the mine was 30 years.

Scott Glen. Brush Valley Mine.

Analyses 22501 to 22506 (p. 79). Semibituminous coal, Windber field, from Brush Valley mine, a drift mine one-half mile southwest of Scott Glen, East Wheatfield Township, on the Black Lick branch of the Pennsylvania R. R. Coal bed said to be B, Miller, or Lower Kittanning; Carboniferous age, Allegheny formation. The coal is soft. Average thickness, about 3 feet 10 inches; dip, about 4 per cent south. Roof, hard gray shale 3 inches to 1 foot thick, overlain by a conglomerate; floor, shale 3 to 12 inches thick, under which is 6 to 11 inches of bottom coal, and under this is fire clay. The bottom coal was not shipped, and was only shot up in driving headings and laying room tracks; material from roof and floor did not become mixed with the coal in mining. The coal bed was sampled by E. H. Denny and G. E. McElroy on July 1, 1915, as described below:

Sections of coal bed in Brush Valley mine.

Section	A	B	C	D	E
Laboratory No.	22501	22502	22503	22504	22505
Roof, shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal, bony	.. ..	.. ..	.. ..	.. ..	a¾
Coal	6	5	4	½	5½
"Sulphur"	a½	1/16	.. ..	¼	¼
Coal	½	.. ..	.. ..	4¾	.. ..
"Sulphur"	a½	.. ..	a1	⅛	.. ..
Coal	3	.. ..	.. ..	.. ..	.. ..
"Sulphur"	⅛	.. ..	.. ..	.. ..	.. ..
Coal	3	.. ..	.. ..	.. ..	.. ..
"Sulphur"	¼	.. ..	.. ..	.. ..	.. ..
Coal	1	.. ..	8½	8	7
"Sulphur"	⅛	.. ..	.. ..	.. ..	.. ..
Coal binder	.. ..	.. ..	⅝	¾	¾
Coal	5	11½	.. ..	3½	.. ..
"Sulphur"	⅛	⅜	.. ..	¼	.. ..
Coal	11	1 1	1 3	1 2	1 4½
"Sulphur"	a¼	⅛	a⅞	⅛	a⅜
Coal	1 2	1 4	1 7¼	1 ½	1 1
"Sulphur" and coal	.. ..	.. ..	.. ..	.. ..	a6
Floor, shale, bottom coal and clay.					
Thickness of bed	3 9⅜	3 10 11/16	4 1¼	3 8½	4 2⅛
Thickness of coal sampled	3 8⅛	3 9 11/16	3 11⅜	3 8½	3 7

a Not included in sample.

Section A (sample 22501) was measured at the face of 6 right entry, 4,450 feet S. 75° W. off drift mouth. Section B (sample 22502) was measured on pillar in 36 room, 280 eet off 7 right heading and 3,300 feet S. 65° W. of drift mouth. Section C (sample 22503) fwas measured at face of 8 right back entry, 3,400 feet S. 55° W. of drift mouth. Section D (sample 22504) was measured in 11 right back entry, 10 feet off main entry, 3,675 feet S. 30° W. of drift mouth. Section E (sample 22505) was measured in face of 1 butt back entry, 5 left entry, 2,025 feet S. 10° W. of drift mouth.

An ultimate analysis of a composite sample made by combining samples 22501 to 22505 is shown under laboratory No. 22506.

A car sample of 1,150 pounds was crushed and quartered down to 10 pounds. Analysis of this sample is shown under No. 22507.

The mine is worked by the room-and-pillar system. In 1915 the coal was undercut with picks. Permissible explosives were used in shooting down the coal and in brushing the roof and floor. The coal was run over 1-inch bars and the lump was picked by 5 or 6 pickers on a picking table. Slack and lump passed into the same car where two more pickers are employed. The lump coal was small. There was one loading track, with a capacity for 16 empty and 21 loaded cars. There was about 2,500 acres of unmined coal. The probable lifetime of the mine was 30 years. The future output was to be derived almost entirely from advance workings. The daily output averaged 600 tons; maximum day's run, 780 tons.

JEFFERSON COUNTY.

Brockwayville. West Clarion Mine.

Analyses 17448, 17449, and 17450 (p. 79). Bituminous coal, Punxsutawney field, from West Clarion mine, in Snyder Township, 1 mile west of Brockwayville, on the Erie R. R. Coal beds, Lower Freeport or D, Upper Freeport or E, and Lower Kittanning or B; Carboniferous age, Allegheny formation. Thickness of beds: Lower Freeport, 3 feet 4 inches; Upper Freeport, 2½ feet; Lower Kittanning, 4 feet. The beds were sampled by M. A. Pishel on June 5, 1913.

Sample 17448 was measured in the Lower Freeport bed, in 8 drift, 2 right entry, 800 feet from mine mouth, and represented 3 feet 4 inches of coal, the thickness of the bed. Sample 17449 was measured in the Upper Freeport bed, in 2 room, 14 drift, main entry, and represented 2 feet 6 inches of coal, the thickness of the bed. Sample 17450 was measured in the Lower Kittanning bed, 1 face drift, 3 right entry, 4,000 feet from mine mouth, and represented 4 feet of coal, the thickness of the bed.

The daily production in each bed was 325, 50, and 125 tons, respectively.

SOMERSET COUNTY.

Bakersville. Wyand Mine.

Analysis 17689 (p. 79). Semibituminous coal, Windber field, Johnstown Basin, from Wyand mine, a drift mine one-half mile south of Bakersville, 7½ miles west of Somerset, a station on the Baltimore & Ohio R. R. Coal bed not identified; Carboniferous age, Conemaugh formation. The bed was sampled by J.H. Hance on August 30, 1913, as described below:

Section of coal bed in Wyand mine.

	Ft.	in.
Shale	[a]2	
Coal	1	8
Binder	[a]3	
Coal		6
Thickness of bed	2	7
Thickness of coal sampled	2	2

[a] Not included in sample.

The sample was taken 300 feet southwest of the mine entrance. This is a country bank that is only occasionally mined.

Berlin. John Wills No. 2 Mine.[a]

Analyses W46366, W46367, W46368, and 19512 (p. 79). Semibituminous coal, Somerset field, from John Wills No. 2 mine, a drift mine 1½ miles northeast of Berlin on the Berlin branch of the Baltimore & Ohio R. R. Coal bed, C′ or Upper Kittanning; Carboniferous age, Allegheny formation. Thickness, 2½ to 3½ feet; average, 2 feet 11 inches. Roof and floor, hard sandstone. The bed was sampled by P. M. Riefkin on June 2, 1914, as described below:

Sections of coal bed in John Wills No. 2 mine.

Section	A	B	C
Laboratory No	W46366	W46367	W46368
Roof, sandstone.	Ft. in.	Ft. in.	Ft. in.
Coal	5	1 6	2 3½
Bone and shale (streak)	[a] ½	.. ..	.. ..
Shale	.. ..	[a] 3½	[a] 2
Coal	1 3½	10	3
Coal, bony	[a] ¾	.. ..	.. ..
"Sulphur"	.. ..	.. ..	[a] ½
Coal	11½	.. ..	8
Floor, sandstone.			
Thickness of bed	2 8⅞	2 7½	3 5
Thickness of coal sampled	2 8	2 4	3 2½

[a] Not included in sample.

Section A (sample W46366) was cut from 1 butt entry, dip heading, 700 feet from drift mouth. Section B (sample W46367) was cut 30 feet from face of main dip heading, 750 feet from drift mouth. Lower 10 inches of coal had streaks of "sulphur." Section C (sample W46368) was cut at face of 1 left heading, main heading, 800 feet from drift mouth.

An ultimate analysis of a composite sample made by mixing samples W46366, W46367, and W46368 is shown under laboratory No. 19512.

In 1914 the coal was undercut by hand and shot down with black blasting powder. There were no screens at this mine, the entire output being loaded as run-of-mine. One trimmer cleaned the coal as it was loaded. The one loading track had a capacity of 12 empty cars. The coal is friable, but near the roof gradually becomes hard and bonelike, it being difficult to determine the line of separation between bone and coal. The mine had a capacity of 250 tons and an average daily output in 1914 of 75 tons, which was all derived from advance workings. The probable lifetime of the mine was 10 years.

Berlin. John Wills No. 3 Mine.[b]

Analyses W46369 to W46373 and 19513 (p. 80). Semibituminous coal, Somerset field, from John Wills No. 3 mine, a drift mine 1½ miles east of Berlin, on the Berlin branch of the Baltimore & Ohio R. R. Coal bed, C′ or Upper Kittanning; Carboniferous age, Allegheny formation. Thickness varies from 3 feet to 3 feet 10 inches; average, 3½ feet. Roof, bony coal overlain by sandstone; floor, hard sandstone with a smooth surface. The bed was sampled by P. M. Riefkin on June 3, 1914, as described on page following.

[a] Also known as Allied No. 2 mine.

[b] Also known as Allied No. 3 mine.

Sections of coal bed in John Wills No. 3 mine.

Section	A	B [a]	C	D	E
Laboratory No	W46369	W46370	W46371	W46372	W46373
Roof, sandstone.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal, bony	[b] 3	[b] 2	[b] 2	[b] 2	[b] 1
Gray coal	.. ..	.. ..	1½	.. ..	.. ..
Coal	2 4	2 7	2 6	2 7	2 5
Shale	[b] 4¾	[b] 3½	[b] 3	[b] 2	[b] 1½
Coal	2	10	11½	9	9½
Coal, bony	¼	.. ..	.. ..	.. ..	.. ..
Coal	8	.. ..	.. ..	.. ..	.. ..
Floor, sandstone.					
Thickness of bed	3 10	3 10½	3 11¾	3 8	3 5
Thickness of coal sampled	3 2½	3 5	3 6¾	3 4	3 2½

[a] 2 feet 7 inches of coal had streak of sulphur in middle. [b] Not included in sample.

Section A (sample W46369) was cut from 1 pillar, 7 right heading, main heading, 2,600 feet from mine mouth. Section B (sample W46370) was cut from pillar, 8 left heading, between 6 and 7 rooms, 2,500 feet from mine mouth. Section C (sample W46371) was cut from face of 8 room, 6 right heading, 2,600 feet from mine mouth. Section D (sample W46372) was cut from gangway stump between 3 and 4 rooms, 4 right heading, 1,500 feet from mine mouth. Section E (sample W46373) was cut from pillar between 3 and 4 rooms, right heading, 1,400 feet from mine mouth.

An ultimate analysis of a composite sample made by mixing samples W46369 to W46373 is shown under laboratory No. 19513.

In 1914 the coal was undercut by hand in the bottom part of the bed and shot down with black blasting powder. The tipple had one loading track, with a capacity of 12 empty cars. There were no screens, the entire output being loaded as run-of-mine. One trimmer picked the coal as it was loaded on the cars. The coal was friable. The coal near the roof gradually becomes hard and bonelike, it being difficult to determine between bone and coal. The mine had a capacity of 200 tons and an average daily output of 75 tons, which was derived from pillar workings. The mine had a probable lifetime of 3 years.

Boswell. J. G. Berkey Mine.

Analysis 17832 (p. 80). Semibituminous coal, Windber field, Johnstown Basin, from J. G. Berkey mine, a drift mine 2 miles northwest of Boswell, a station on the Baltimore & Ohio R. R. Coal bed, Pittsburgh; Carboniferous age, Monongahela formation. Thickness, 4 feet 10 inches. The bed was sampled by G. B. Richardson on September 29, 1913, at one point 200 feet from entrance. The sample represented he lower 3½ feet. The mine is a country bank. The sample was weathered.

Boswell. Reuben Horner Mine.

Analysis 17831 (p. 80). Bituminous coal, Windber field, Johnstown Basin, from Reuben Horner mine, a slope mine 2 miles northwest of Boswell, a station on the Baltimore & Ohio R. R. Coal bed, Pittsburgh; Carboniferous age, Monongahela formation. The bed was sampled by G. B. Richardson on September 29, 1913, at one point 50 feet from mine entrance. The coal bed at the point sampled was 10 feet 6 inches thick. The sample represented the lower 10 feet. The mine is a country bank. The sample was weathered.

Boswell. Orenda Mine.

Analysis 17551 (p. 80). Semibituminous coal, Windber field, from Orenda mine, a drift mine at Boswell, on the Baltimore & Ohio R. R. Coal bed, Upper Kittanning; Carboniferous age, Allegheny formation. Sample 17551 represented a 30-ton car of

run-of-mine coal used in combustion tests (Pgh. No. 405) at the Bureau of Mines testing plant at Pittsburgh, Pa. The sample was taken by E. R. Linkenhoker on July 15, 1913, while the car was being unloaded.

CAIRNBROOK. HITECHEW (FLEEGLE) MINE.

Analysis 19851 (p. 80). Semibituminous coal, Somerset field, from Hitechew (Fleegle) country bank, a drift mine 2½ miles southeast of Cairnbrook. No railroad connection. Coal bed, Brookville or A; Carboniferous age, Allegheny formation. Roof and floor, shale. The bed was sampled by G. B. Richardson on September 18, 1914, as described below:

Section of coal bed in Hitechew mine.

	Ft.	in.
Roof, shale.		
Bone	[a]	4
Coal	1	0
Shale	[a]	5½
Coal	1	6
Floor, shale.		
Thickness of bed	3	3½
Thickness of coal sampled	2	6

[a] Not included in sample.

The sample was cut from face of small entry west of main heading, 300 feet from mine mouth.

CAIRNBROOK. LOYAL HANNA NO. 6 MINE.

Analyses 19848 to 19850 (pp. 80–81). Semibituminous coal, Somerset field, from Loyal Hanna No. 6 mine, a drift mine at Cairnbrook, on the Cairnbrook branch of the Pennsylvania R. R. Coal bed, Lower Kittanning or B; Carboniferous age, Allegheny formation. Roof and floor, shale. The bed was sampled by G. B. Richardson on September 18, 1914, as described below:

Sections of coal bed in Loyal Hanna No. 6 mine.

Section	A		B	
Laboratory No.	19848		19849	
Roof, shale.	Ft.	in.	Ft.	in.
Coal, bony	[a]	10	[a] 1	3
Coal	3	2	3	2
Coal, bony	[a]	8	[a] 1	7
Floor, shale.				
Thickness of bed	4	8	6	0
Thickness of coal sampled	3	2	3	2

[a] Not included in sample.

Section A (sample 19848) was cut from the face of "empty" southwest entry. Section B (sample 19849) was cut from the face of "loaded" south entry.

An ultimate analysis of a composite sample made by mixing face samples 19848 and 19849 is given under laboratory No. 19850.

EDIE. LEVI BERKEY MINE.

Analysis 17691 (p. 81). Semibituminous coal, Windber field, Johnstown Basin, from Levi Berkey mine, a drift mine 1¾ miles northwest of Edie and 3½ miles west of Acosta, a station on the Baltimore & Ohio R. R. Coal bed, Upper Freeport or E; Carboniferous age, Allegheny formation. The bed was sampled by J. H. Hance on August 30, 1913. as described on page following.

Section of coal bed in Levi Berkey mine.

	Ft.	in.
Roof, not stated.		
Coal	2	11½
Binder		a 1¼
Coal		4½
Binder		a ½
Coal		7¼
Floor, not stated.		
Thickness of bed	4	1
Thickness of coal sampled	3	11¼

a Not included in sample.

The sample was taken 400 feet north 60° west of drift mouth.

The mine is a country bank that is only occasionally mined.

GILLETTE. JAKE MILLER MINE.

Analysis 17692 (p. 81). Bituminous(?) coal, Windber field, Johnstown Basin, from Jake Miller mine, a drift mine 1¾ miles southwest of Gillette and 7 miles northwest of Somerset, a station on the Baltimore & Ohio R. R. Coal bed, not named; Carboniferous age, Conemaugh formation. The bed was sampled by J. H. Hance on August 30, 1913, as described below:

Section of coal bed in Jake Miller mine.

	Ft.	in.
Roof, not stated.		
Coal	2	0
Binder		a 2
Coal		4½
Coal, dirty		5½
Floor, not stated.		
Thickness of bed	3	0
Thickness of coal sampled	2	10

a Not included in sample.

The sample was taken 500 feet northeast of mine mouth.

The mine is a country bank that is only occasionally mined.

HOLSOPPLE. HAWS NO. 3 MINE.

Analyses 22541 to 22547 (p. 81). Semibituminous coal, Windber field, from Haws No. 3 mine, a shaft mine with a shaft 180 feet deep, one-fourth mile northeast of Holsopple station, Conemaugh Township, on the Somerset and Cambria branch of the Baltimore & Ohio R. R. Coal bed, Lower Kittanning, Miller, or B; Carboniferous age, Allegheny formation. The coal is soft. Average thickness of bed, about 3 feet 6 inches; dip, 3 or 4 per cent northwest. Roof, hard gray shale; floor, hard firm underclay. Material from the roof and floor did not become mixed with the coal in mining. The bed was sampled July 8, 1915, by E. H. Denny and G. E. McElroy, as described below:

Sections of coal bed in Haws No. 3 mine.

Section	A		B		C		D		E	
Laboratory No.	22541		22542		22543		22544		22545	
Roof, hard gray shale, sandstone above.	Ft.	in.	Ft.	in.	Ft.	in.	Ft.	in.	Ft.	in.
Coal	--	--	--	--	--	--	--	--		1½
"Sulphur"	--	--	--	--	--	--	--	--		⅜
Coal	--	--	--	--	--	--		2		½
"Sulphur"	--	--	--	--	--	--		a ¼		a ¼
Coal		8¾		8¼		8½		5¾		5
"Cannel" coal		¼		½		¼		½		¼
Coal		10½	1	6	1	9		5½		7
"Sulphur"		a 1¼		1/16		⅛		⅜		3/16
Coal		9½		1		7¼		4	1	0
"Sulphur"		1/16		1/16		a ⅜		⅛	--	--
Coal		6½		10½		5½		10½	--	--
"Sulphur"		⅜		⅜	--	--		⅜	--	--
Coal		8		5½	--	--	1	1⅛	--	--
Floor, hard firm underclay.										
Thickness of bed	3	9 3/16	3	8¼	3	7	3	6	2	2 1/16
Thickness of coal sampled	3	7 1/16	3	8¼	3	6⅝	3	5¾	2	2 1/16

a Not included in sample.

Section A (sample 22541) was measured at face of 3 right entry, 7 south entry, 2,900 feet S. 55° W. of shaft. Section B (sample 22542) was measured at face of 4 right entry, 7 south entry, 3,000 feet S. 45° W. of shaft. Section C (sample 22543) was measured at face of 6 south entry, 2,900 feet S. 30° W. of shaft. Section D (sample 22544) was measured in 15 room, 1 right entry, 7 south entry, 50 feet up on the left rib, 2,900 feet S. 70° W. of drift mouth. Section E (sample 22545) was measured at face of main left air course, 3,400 feet S. 80° W. of shaft.

An ultimate analysis of a composite sample made by combining samples 22541 to 22545 is given under laboratory No. 22546.

A car sample (lab. No. 22547) of 1,000 pounds was also taken, crushed, and quartered down to 10 pounds.

The mine is worked by the room-and-pillar system. In 1915 the coal was mined by machines and shot down with black blasting powder. All of the coal was shipped as run-of-mine. The lump coal on the cars was fairly large. There were three loading tracks, with a capacity of 20 empty and 30 loaded cars, which were also used by two other mines. An automatic self-dumping cage was used. Approximately 1,000 acres of coal remained to be taken from the opening. The estimated lifetime of the mine was given as 10 years. Practically all of the future output was to be derived from advance work. The daily capacity of the mine averaged about 300 tons, with a maximum day's run of 350 tons. It was planned to increase the daily output to 1,000 tons.

Somerset. Neva Mine.

Analysis 17693 (p. 81). Semibituminous coal, Somerset field, from Neva mine, a drift mine three-fourths mile northeast of Somerset, with a tipple on the main line of the Somerset and Cambria branch of Baltimore & Ohio R. R. Coal bed, Upper Freeport or E; Carboniferous age, Allegheny formation. The bed was sampled by J. H. Hance on August 29, 1913, as described below:

Section of coal bed in the Neva mine.

	Ft.	in.
Roof, not stated.		
Shale		[a]3
Coal	2	4
Binder		[a]1
Coal		3½
Binder		[a]¾
Floor, not stated.		
Thickness of bed	3	¼
Thickness of coal sampled	2	7½

[a] Not included in sample.

The sample was taken at a point 400 feet from mine mouth.

This was a small shipping mine.

Somerset. Sanner and Shaffer Mine.

Analysis 17694 (p. 81). Semibituminous coal, Somerset field, from Sanner and Shaffer mine, a drift mine one-half mile southeast of Somerset, a station on the Baltimore & Ohio R. R. Coal bed unidentified; Carboniferous age, Allegheny formation. The bed was sampled by J. H. Hance on August 29, 1913, as described below:

Section of coal bed in Sanner and Shaffer mine.

	Ft.	in.
Roof, not stated.		
Bone		[a]3
Coal	2	8½
Binder		[a]5
Coal, dirty		[a]9
Floor, not stated.		
Thickness of bed	4	1½
Thickness of coal sampled	2	8½

[a] Not included in sample.

The sample was cut 300 feet from the mine mouth.
The mine is a country bank.

Somerset. Stauffer No. 3. Mine.

Analysis 17695 (p. 81). Semibituminous coal, Somerset field, from Stauffer No. 3 mine, a drift mine 4½ miles southeast of Somerset; connected by tram with the Baltimore & Ohio R. R. at Wells Creek. Coal bed, Lower Freeport or D; Carboniferous age, Allegheny formation. The sample was cut by J. H. Hance on August 29, 1913, in 1 right entry, 20 feet inside 2 butt entry, and represented 4 feet 3½ inches of coal. There was 2 inches of shale above the coal.

Windber. Lochrie Arrow Mine.

Analyses 20292 to 20296 and 20298 (p. 81). Semibituminous coal, Windber field, from Lochrie Arrow mine, a drift mine 9 miles south of Windber, on the Pennsylvania R. R. Coal bed, Lower Kittanning, B or Miller; Carboniferous age, Allegheny formation. The coal is soft. Thickness, 3 feet 6½ inches to 3 feet 9 inches; average thickness, about 3 feet 7 inches. Roof, hard gray shale generally with smooth surface; floor, shaly clay with smooth surface. The bed was sampled by D. J. Parker on December 2, 1914, as described below:

Sections of coal bed in Lochrie Arrow mine.

Section	A	B	C	D	E
Laboratory No	20292	20293	20294	20295	20298
Roof, gray shale	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in*
Coal, soft	3 0	3 2	2 9	3 ½	2 11½
Shale	.. ..	[a] ½	.. ..	[a] ¾	[a] ½
"Mother coal"	¼	.. ..	.. ..	.. ..	.. ..
Coal, hard	3½	5	9¾	3¾	6
Floor, shaly clay.					
Thickness of bed	3 3¾	3 7½	3 6¾	3 5	3 6
Thickness of coal sampled	3 3¾	3 7	3 6¾	3 4½	3 5½

[a] Not included in sample.

Section A (sample 20292) was measured at face of 7 room, 1 left entry, 250 feet N. 40° E. of mine mouth. Section B (sample 20293) was measured at face of 3 left entry, 900 feet N. 60° E. of mine mouth. Section C (sample 20294) was measured at face of 2 left entry, 700 feet N. 45° E. of mine mouth. Section D (sample 20295) was measured at face of crosscut, main air course, 1,100 feet east of mine mouth. Section E (sample 20298) was cut from pillar of 3 room, 2 right entry, 200 feet southeast of mine mouth.

The ultimate analysis of a composite sample made by mixing samples 20292 to 20295 is given under laboratory No. 20296. At the time of sampling the mine had been in operation about 6 months, the most distant workings being only about 1,200 feet from the pit mouth. The wooden tipple, capacity 1,000 tons per day, had one loading track with a capacity of 40 empty and 40 loaded cars. The entire output was shipped as run of mine, receiving only such preparation as was usually given it by the miner and the picker on the car. The coal was undercut by hand and shortwall machines, and shot down with black powder. The impurities were a bone lying on top of the coal which usually followed the coal on being shot down and was easily separated from it, and a small band of shale which occurred near the bottom of the coal and was removed whenever practicable. The bone did not usually become mixed with the coal when the latter fell. The lower part of the bed was hard and carried several "sulphur" streaks, irregular in occurrence and thickness. The daily average output, the mine working single shift, was 700 tons. The mine had a probable lifetime of 6 to 8 years with accessibility to 400 acres of coal.

Sample 22534 represented a car sample taken at the mine by E. H. Denny and G. E. McElroy on July 7, 1915. The coal from the mine was loaded directly into the railroad cars from a wooden tipple. After coal from the first mine car was dumped into the railroad car, six scoop shovels of coal were shoveled from the railroad car onto a platform alongside the car where one man crushed the coal with a wooden mallet. This process was repeated after each car was dumped, coal from 14 mine cars being used to make the 25-ton load. An occasional large lump of coal was also taken. The coal thus taken as a sample was cleaned before being shoveled up, as was the coal in the car, by the two trimmers. The coal taken as a sample (about 1,000 pounds) was reduced by the Bureau of Mines sampling method down to 20 or 25 pounds, from which a 10-pound (3 cans) sample was obtained. Most of the 10-pound sample appeared to be much finer than one-fourth inch.

ZIMMERMAN. RALPHTON NO. 6 MINE.

Analysis 17690 (p. 81). Semibituminous coal, Somerset field, from Ralphton No. 6 mine, a shaft mine at Zimmerman on the Pittsburgh, Westmoreland & Somerset R. R. Coal bed, Upper Freeport or E; Carboniferous age, Allegheny formation. The bed was sampled by J. H. Hance on August 30, 1913, as described below:

Section of coal bed in Ralphton No. 6 mine.

	Ft.	*in.*
Roof, not stated.		
Coal	2	7
Binder	[a]	1½
Coal		4
Binder		1
Coal		4½
Floor, not stated.		
Thickness of bed	3	6
Thickness of coal sampled	3	4½

[a] Not included in sample.

The sample was taken 1,200 feet east of the shaft. This is a shipping mine.

TIOGA COUNTY.

ANTRIM. ANNA S. MINE.

Analysis 17453 (p. 82). Semibituminous coal, Tioga County field, from Anna S. mine, a drift(?) mine one-half mile west of Antrim, Morris Township, on the New York Central & Hudson River R. R. Coal bed, Bloss; Carboniferous age, Allegheny formation. Thickness, 4½ feet. The bed was sampled by M. A. Pishel on May 29, 1913, as described below:

Section of bed in Anna S. mine.

	Ft.	*in.*
Roof, not stated.		
Coal	1	11
Coal, bony		[a]3
Coal	1	0
Coal, bony		[a]5
Coal		10
Floor, not stated.		
Thickness of bed	4	5
Thickness of coal sampled	3	9

[a] Not included in sample.

The sample was taken in room, side entry, 1 mile from mine mouth.
Daily output of the mine was 775 tons.

LANDRUS. BEAR RUN MINE.

Analysis 17452 (p. 82). Semibituminous coal, Tioga County field, from Bear Run mine, a drift(?) mine one-half mile north of Landrus, Charleston Township, on the Erie R. R. Coal bed, Bloss; Carboniferous age, Allegheny formation. Thickness, 4 feet 1½ inches. The bed was sampled by M. A. Pishel on May 28, 1913, as described below:

Section of coal bed in Bear Run mine.

	Ft.	in.
Roof, not stated.		
Coal	1	1½
Shale		[a]3
Coal, impure		[a]10
Coal	1	2
Pyrite (lens)		[a]3
Coal		6
Floor, not stated.		
Thickness of bed	4	1½
Thickness of coal sampled	2	9½

[a] Not included in sample.

The sample was taken on pillar, main entry, 700 feet from mine mouth.

The daily production of the mine was 150 tons.

MORRIS RUN. NEW MINE.

Analyses 17451 and 17454 (p. 82). Semibituminous coal, Tioga County field, from New mine, a drift mine at Morris Run, Hamilton Township, on the Tioga division of the New York Central & Hudson River R. R. Coal beds, Bloss and Morgan; Carboniferous age, Allegheny formation. Thickness: Bloss bed, 3 feet 2 inches; Morgan bed, 3 feet. The beds were sampled by M. A. Pishel on May 27, 1913, as described below:

Sample 17451 was taken in Morgan bed at 4 room, 1 east entry, 1 mile from mine mouth, and represented 2 feet 8 inches of coal. There was 6 inches of bony coal above the part sampled.

Sample 17454 was taken in Bloss bed from Sterling entry, 3 miles from mine mouth, and represented 2 feet 5 inches of coal. There was 7 inches of bony coal above the part sampled.

The daily output of mine was 1,500 tons.

WESTMORELAND COUNTY.

LIGONIER. JOHN DYER MINE.

Analysis 17901 (p. 82). Bituminous coal, Ligonier Valley field, from John Dyer, mine, a drift (country bank) mine in Ligonier Township, with no railroad connection, 3 miles southeast of Ligonier, a station on the Ligonier Valley R. R. Coal bed, Upper Freeport or E; Carboniferous age, Allegheny formation. The bed was sampled by G. B. Richardson on October 15, 1913, as described below:

Section of coal bed in John Dyer mine.

	Ft.	in.
Roof, not stated.		
Coal	2	1
Shale		[a]1
Coal		4
Shale		[a]1
Coal		4
Floor, not stated.		
Thickness of bed	2	11
Thickness of coal sampled	2	9

[a] Not included in sample.

The sample was taken at end of workings, 200 feet from mine mouth.

TENNESSEE.

ANDERSON COUNTY.

Coal Creek. Black Diamond No. 1 Mine.

Analyses 21645, 21646, 21647, 21648, and 21649 (pp. 82–83). Bituminous coal from Black Diamond No. 1 mine, a drift mine 3 miles north-northwest of Coal Creek, on the Southern and the Louisville & Nashville Railroads. Coal bed, Coal Creek; Carboniferous age, Briceville shale. Roof, sandy shale; floor, shale and clay. The bed was sampled by F. R. Clark on March 16 and 17, 1915, as described below:

Sections of coal bed in Black Diamond No. 1 mine.

Section	A	B	C	D
Laboratory No.	21645	21646	21647	21648
Roof, sandy shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal, "rashy"	4½	.. ..	.. ..	.. ..
Coal	.. ..	4	.. ..	.. ..
"Rash"	a ½	a ½	.. ..	.. ..
Coal, massive and blocky	3 2	1 7	.. ..	a 5
"Rash" and coal interbedded	.. ..	a ½	a 6	a 2
Coal, massive and hard	.. ..	1 7	2 8	3 0
Shale	.. ..	.. ..	a 6	.. ..
"Rash"	.. ..	.. ..	a 2	.. ..
Floor, shale.				
Thickness of bed	3 7	3 7	3 10	3 7
Thickness of coal sampled	3 6½	3 6	2 8	3 0

a Not included in sample.

Section A (sample 21645) was measured on 25 pillar, 1 right entry, 12 east entry, 10,900 feet S. 22° W. of mine mouth. Section B (sample 21646) was measured at face of 11 room, 7 right entry, 12 east entry, 9,500 feet south of mine mouth. Section C (sample 21647) was measured at face off 4 left entry, 10 west entry, 8,200 feet S. 40° W. of mine mouth. Section D (sample 21648) was measured at face of 1 airway, 1 left entry, 10 west entry, 8,900 feet S. 24° W. of mine mouth.

The ultimate analysis of a composite sample made by combining samples 21645, 21646, 21647, and 21648 is shown under laboratory No. 21649.

Coal Creek. Fraterville Mine.

Analyses 21636, 21637, 21638, 21639 (p. 83). Bituminous coal, from Fraterville mine, a drift mine 1¼ miles southwest of Coal Creek, on the Southern and the Louisville & Nashville Railroads. Coal bed, Coal Creek; Carboniferous age, Briceville shale. Roof, sandy shale; floor, shale. The bed was sampled by F. R. Clark on March 12, 1915, as described below:

Sections of coal bed in Fraterville mine.

Section	A	B	C
Laboratory No.	21636	21637	21638
Roof, sandy shale.	Ft. in.	Ft. in.	Ft. in.
"Rash"	a 3	.. ..	.. ..
Coal, with some "rash"	.. ..	9	9
Coal, massive	3 3	2 10	2 10
Shale and clay	a 6	a 7	.. ..
Coal, massive and blocky	7	5	.. ..
Floor, shale.			
Thickness of bed	4 7	4 7	3 7
Thickness of coal sampled	3 10	4 0	3 7

a Not included in sample.

Section A (sample 21636) was measured at face of 2 room, 14 right entry, new main entry, 5,560 feet N. 40° W. of mine mouth. Section B (sample 21637) was measured

at 3 room, 14 right entry, new main entry, 5,700 feet N. 38° W. of mine mouth. Section C (sample 21638) was measured at face of 3 room, 16 left entry, old main entry, 4,900 feet N. 71° W. of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 21637 and 21638 is given under laboratory No. 21639.

The coal in sample 21637 probably became slightly weathered while in transit, because the sample was loose in the mail pouch when received at the laboratory.

Coal Creek. Klondike or No. 5 Mine.

Analyses 21640 to 21644 (p. 83). Bituminous coal, from Klondike or No. 5 mine, a slope mine 3 miles north-northwest of Coal Creek, on the Southern and the Louisville & Nashville Railroads. Coal bed, Coal Creek; Carboniferous age, Briceville shale. The bed was sampled by F. R. Clark on March 15 and 16, 1915, as described below:

Sections of coal bed in Klondike or No. 5 mine.

Section	A	B	C	D
Laboratory No.	21640	21641	21642	21643
Roof, sandy shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
"Rash" and coal	[a] 2	.. ..	[a] 8	.. ..
Coal	.. ..	.. ..	.. ..	[a] 2½
"Sulphur" lens	.. ..	.. ..	.. ..	[a] 2
"Rash" and coal	.. ..	.. ..	.. ..	[a] 3
Coal, massive, hard, and blocky	3 6	3 9	.. ..	.. ..
Coal, dull and hard	.. ..	.. ..	1 3	1 8
"Rash"	.. ..	.. ..	[a] 1½	.. ..
Coal, bright with dull bands	.. ..	.. ..	.. ..	1 11
Shale	[a] 8	[a] 9	.. ..	[a] 3
Coal, massive	6	7	.. ..	.. ..
Coal, bright and hard	.. ..	.. ..	1 5½	10
"Rash"	.. ..	[a] 1	.. ..	.. ..
Clay	.. ..	.. ..	[a] ½	.. ..
Coal	.. ..	.. ..	2	.. ..
Clay	.. ..	.. ..	[a] ½	.. ..
Coal	.. ..	.. ..	1½	.. ..
Shale	.. ..	.. ..	[a] 8½	.. ..
Coal	.. ..	.. ..	7	.. ..
"Rash"	.. ..	.. ..	[a] 2	.. ..
Floor, clay.				
Thickness of bed	4 10	5 2	5 4	5 3½
Thickness of coal sampled	4 0	4 4	3 7	4 5

[a] Not included in sample.

Section A (sample 21640) was measured at face of main entry, 7,700 feet N. 65° W. of mine mouth. Section B (sample 21641) was measured at face of 30 left entry, 7,500 feet S. 39° W. of mine mouth. Section C (sample 21642) was measured at face of 22 left entry, 7,900 feet S. 39° W. of mine mouth. Section D (sample 21643) was measured at face of 32 room, 26 left entry, 7,600 feet S. 39° W. of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 21640, 21641, 21642, and 21643 is given under laboratory No. 21644.

Coal Creek. Middle Ridge Mine.

Analysis 21680 (p. 83). Bituminous coal from Middle Ridge mine, a drift mine 4½ miles southwest of Coal Creek on the Southern and the Louisville & Nashville Railroads. Coal bed, Coal Creek; Carboniferous age, Briceville shale. Roof, sandy shale; floor, clay. The bed was sampled by F. R. Clark on March 13, 1915, as described on page following.

Section of coal bed in Middle Ridge mine.

	Ft.	in.
Roof, sandy shale.		
"Rash"		a 2
Coal		a 2
"Rash"		a 2
Coal	3	5
Floor, clay.		
Thickness of bed	4	11
Thickness of coal sampled	3	5

a Not included in sample.

The section was measured on rib of left main entry, 100 feet southwest of mine mouth. The sample was wet and slightly weathered.

COAL CREEK. SMITH MINE.

Analysis 21627 (p. 83). Bituminous coal, from Smith mine, a small drift mine 1½ miles west of Coal Creek on the Southern and the Louisville & Nashville Railroads. Coal bed not identified, but is geologically higher than the Coal Creek bed; Carboniferous age, Wartburg sandstone (?). Roof, sandy shale; floor, clay. The bed was sampled by F. R. Clark on March 13, 1915.

The sample was collected at face of 1 right entry, main entry, 75 feet north of mine mouth, and represented 2 feet of coal the thickness of the bed. The coal at the point sampled was slightly weathered.

COAL CREEK. TENNESSEE MINE.

Analyses 21632 to 21635 (p. 83). Bituminous coal, from Tennessee mine, a drift mine 5 miles southwest of Coal Creek, on the Southern and the Louisville & Nashville Railroads. Coal bed, Coal Creek; Carboniferous age, Briceville shale. The bed was sampled by F. R. Clark on March 13, 1915, as described below:

Sections of coal bed in Tennessee mine.

Section	A		B		C	
Laboratory No.	21632		21633		21634	
Roof, sandy shale.	Ft.	in.	Ft.	in.	Ft.	in.
Bone	..	..	..	..		a 3
Clay	..	..	..	..		a 2
"Rash"		a 2		a 2	..	..
Coal, badly crushed, locally containing some "rash"		7	1	11	1	2
Clay and rash	..	..		a 10		a 3
Coal, bright	..	..	..	..		5
Clay	..	..	..	..		a 3
Coal, massive, but locally crushed	3	1	2	0	2	8
Floor, clay.						
Thickness of bed	3	10	4	11	5	2
Thickness of coal sampled	3	8	3	11	4	3

a Not included in sample.

Section A (sample 21632) was measured on A pillar, main entry, 2,840 feet S. 40° W. of mine mouth. The sample was damp. Section B (sample 21633) was measured at face of 1 room, 625 entry, Minersville side, 4,040 feet S. 57° W. of mine mouth. The sample was damp. Section C (sample 21634) was measured at face of 1 room, 11 right entry, 4,060 feet S. 88° W. of mine mouth.

The ultimate analysis of a composite sample made by mixing samples 21632, 21633, and 21634 is given under laboratory No. 21635.

COAL CREEK. THISTLE MINE.

Analyses 21628 to 21631 (p. 83). Bituminous coal, from Thistle mine, a drift mine 3 miles southwest of Coal Creek, on the Southern and the Louisville & Nashville

Railroads. Coal bed, Coal Creek; Carboniferous age, Briceville shale. The bed was measured by F. R. Clark on March 12, 1915, as described below:

Sections of coal bed in Thistle mine.

Section	A		B		C	
Laboratory No.	21628		21629		21630	
Roof, sandy shale.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Coal, bright and laminated		2¾	..	..	..	..
"Rash"		¼	..	..	..	..
Coal and "rash" interbedded		4½	..	..	..	..
Coal, laminated with hard and soft streaks	..	..		9	1	1
Coal, bright and blocky		4½	..	..	..	..
Coal, dull and hard, locally cannel		2		6		4
Coal, massive, hard, and blocky	2	10	2	11	2	11
Coal		[a] 2	..	..	..	..
Floor, shale.						
Thickness of bed	4	2	4	2	4	4
Thickness of coal sampled	4	0	4	2	4	4

[a] Not included in sample.

Section A (sample 21628) was measured at face of 2 right entry, main face entry, 1,200 feet S. 30° W. of mouth of Dogwood opening. Section B (sample 21629) was measured at face of 63 room, 5 left entry, 1,980 feet S. 72° W. of mine mouth, and represented entire thickness of bed. Section C (sample 21630) was measured at face of 8 room, 4 left entry, 5 left entry, 2,380 feet S. 52° W. of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 21628, 21629, and 21630 is given under laboratory No. 21631.

Oliver Springs. Hall Mine.

Analysis 21427 (p. 83). Bituminous coal from Hall mine, a small drift mine 1¼ miles north-northeast of Oliver Springs, on the Southern and the Louisville & Nashville Railroads. Coal bed, Coal Creek; Carboniferous age, Briceville shale. Average thickness, 2 feet. Roof, sandy shale; floor, clay. The bed was sampled by F. R. Clark on March 11, 1915. The sample was collected at face of main entry, 400 feet east of mine mouth, and represented 2 feet of massive, hard, blocky coal, the lower 2 inches of which contained lenses of "rash."

Oliver Springs. Piedmont Mine.

Analyses 21451 to 21455 (pp. 83–84). Bituminous coal from Piedmont mine, a drift mine 3 miles north-northeast of Oliver Springs, on the Southern and the Louisville & Nashville Railroads. Coal bed, Coal Creek; Carboniferous age, Briceville shale. Average thickness, 4 feet. The bed was sampled by F. R. Clark on March 11, 1915, as described below:

Sections of coal bed in Piedmont mine.

Section	A		B		C		D	
Laboratory No.	21451		21452		21453		21454	
Roof, sandy shale.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
"Rash," containing lenses of coal and "sulphur"		[a] 5		[a] 5	..	..	..	..
Bone	..	..	..	..	..	..		[a] 2
Clay		[a] 3	..	..	..	..		[a] 1½
Coal, cannel(?)	..	..	..	..	..	..		11
Coal, massive and blocky	1	11	4	5	[b] 4	6	[a] 1	3½
Floor, clay.								
Thickness of bed	2	7	4	10	4	6	2	6
Thickness of coal sampled	1	11	4	5	4	6		11

[a] Not included in sample. [b] Contains thin lenses of sulphur.

Section A (sample 21451) was measured at face of Moore's place, Pigankle entry, 1,200 feet north of mine mouth. Section B (sample 21452) was measured at face of 18 room, 6 right entry, 4,000 feet north-northwest, 1,325 feet east-northeast, and 200 feet south-southeast of mine mouth. Section C (sample 21453) was measured at face of 1 left room, 3 right entry, 2,200 feet north-northwest, 800 feet east-northeast, and 45 feet north-northwest of mine mouth. Section D (sample 21454) was measured at mouth of 5 right entry, 3,000 feet north-northwest of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 21451, 21452, and 21453 is given under laboratory No. 21455.

BLEDSOE COUNTY.

ATPONTLEY. ATPONTLEY NO. 6 MINE.

Analyses Nos. 22259, 22260, and 22261 (p. 84). Bituminous coal from Atpontley No. 6 mine, a drift mine 1 mile north of Atpontley, on a spur of the Pikeville branch of the Nashville, Chattanooga & St. Louis Ry. Coal bed, Sewanee; Carboniferous age, "Walden sandstone." Roof, sandy shale; floor, shale. The bed was sampled on May 13, 1915, by F. R. Clark, as described below:

Sections of coal bed in Atpontley No. 6 mine.

Section	A	B
Laboratory No.	22259	22260
Roof, sandy shale.	*Ft. in.*	*Ft. in.*
"Rash" with thin lenses of coal	[a] 4	[a] 1
Coal, lustrous, laminated, and crushed	3 6	7
Coal, bright and hard	.. ..	10
Coal, bright, but badly crushed	.. ..	1 8
Rash	[a] 6	[a] 6
Coal	[a] 10	[a] 10
Floor, shale.		
Thickness of bed	5 2	4 6
Thickness of coal sampled	3 6	3 1

[a] Not included in sample.

Section A (sample 22259) was measured at face of Lusk entry, 1,000 feet southwest of mine mouth. Section B (sample 22260) was measured at face of Smith room, Lusk entry, 1,200 feet west-southwest of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 22259 and 22260 is given under laboratory No. 22261.

CAMPBELL COUNTY.

ANTHRAS. ANTHRAS MINE.

Analyses 21853 to 21856 (p. 84). Bituminous coal from Anthras mine, a drift mine one-half mile south of Anthras, on the Clearfork branch of the Southern Ry. Coal bed, Jellico; Carboniferous age, Briceville shale (?). Roof, sandy shale; floor, clay. The bed was sampled on April 9, 1915, by F. R. Clark, as described below:

Sections of coal bed in Anthras mine.

Section	A	B	C
Laboratory No.	21853	21854	21855
Roof, sandy shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*
"Rash"	.. ..	.. ..	[a] 1
Coal, laminated	.. ..	2	.. ..
Coal, massive, dull, and hard	1 5	1 3	2 9
Coal, lustrous and hard	1 6	1 7	.. ..
Floor, clay.			
Thickness of bed	2 11	3 0	2 10
Thickness of coal sampled	2 11	3 0	2 9

[a] Not included in sample.

Section A (sample 21853) was measured at face of 2 left entry, 2 main entry, 2,450 feet S. 45° E. and 200 feet N. 45° E. of mine mouth. Section B (sample 21854) was measured at face of 1 left entry, 2 main entry, 2,200 feet S. 45° E. and 300 feet N. 45° E. of mine mouth. Section C (sample 21855) was measured on 10 pillar, 2 right entry, 1 main entry, 400 feet S. 45° E. and 400 feet S. 45° W. of mine mouth.

The ultimate analysis of a composite sample made by mixing samples 21853, 21854, and 21855 is given under laboratory No. 21856.

Block. Monarch Mine.

Analyses 22028 to 22032 (p. 85). Bituminous coal, from Monarch mine, a drift mine 1 mile west-southwest of Block on the Southern Ry. Coal bed, Monarch or Upper Dean; Carboniferous age, Scott shale (?). Roof, sandy shale; floor, clay. The bed was sampled April 19, 1915, by F. R. Clark, as described below:

Sections of coal bed in Monarch mine.

Section	A	B	C	D
Laboratory No.	22028	22029	22030	22031
Roof, sandy shale.				
Coal, lustrous and soft	1 1	1 1	1 7	1 0
Coal, dull and hard	2	.. ..	.. ..	2
Coal, bright and soft	4	.. ..	.. ..	4
Shale	[a] 1	[a] 4	[a] 4	[a] 3
Coal, bright and hard	4	.. ..	.. ..	.. ..
Coal, dull and hard	4	.. ..	.. ..	.. ..
Coal, lustrous and hard	9	[b] 2 11½	[b] 2 9	[b] 3 0
Coal, alternating dull and bright bands	1 2	.. ..	.. ..	.. ..
Shale, locally containing lenses of "sulphur"	[a] 1	[a] 1 3	[a] 1 2	[a] ½
Coal, bright and hard	7	11	11	6
Coal, dull and hard	4	.. ..	.. ..	.. ..
Floor, clay.				
Thickness of bed	5 3	6 6½	6 9	5 3½
Thickness of coal sampled	5 1	4 11½	5 3	5 0

[a] Not included in sample. [b] Contained soft, dull band.

Section A (sample 22028) was measured at face of 49 room, 2 left entry, 1,700 feet south of mine mouth. Section B (sample 22029) was measured at face of 3 right entry, 1,050 feet northwest of mine mouth. Section C (sample 22030) was measured at face of 23 room near face of 2 right entry, 1,050 feet north-northwest of mine mouth. Section D (sample 22031) was measured in neck of 1 left entry, 1 left cross entry, 2,000 feet south-southeast of mine mouth.

An ultimate analysis of a composite sample made by mixing face samples 22028 to 22031 is given under laboratory No. 22032.

Block. Pee Wee Mine.

Analyses 22025 to 22027 (p. 85). Bituminous coal from Pee Wee mine, a drift mine 5,000 feet west-southwest of Block on the Southern Ry. Coal bed, Red Ash; Carboniferous age, Scott shale (?). Roof, sandy shale; floor, shale. The bed was sampled April 19, 1915, by F. R. Clark, as described below:

Sections of coal bed in Pee Wee mine.

Section	A	B
Laboratory No.	22025	22026
Roof, sandy shale.		
Coal, bony	.. ..	1
Coal, lustrous and brittle	7	5
Coal, locally contains thin "sulphur" lenses	½	½
Coal, bright	1¼	.. ..
Coal, "rashy"	.. ..	1½
Shale, containing "sulphur" balls	[a] ¾	.. ..
Coal, bright and brittle	2 ½	2 1
"Rash"	.. ..	[a] 1
Floor, clay or shale.		
Thickness of bed	2 10	2 10
Thickness of coal sampled	2 9¼	2 9

[a] Not included in sample.

Section A (sample 22025) was measured on rib near face of 2 left entry, 350 feet west-southwest of mine mouth. Section B (sample 22026) was measured at face of 1 right entry, 300 feet north of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 22025 and 22026 is given under laboratory No. 22027.

Caryville. Bear Wallow Mine.

Analyses 21673 to 21676 (p. 85). Bituminous coal, from Bear Wallow mine, a drift mine 1½ miles southwest of Caryville on the Southern Ry. Coal bed, Coal Creek; Carboniferous age, Briceville shale. Roof, sandy shale; floor, clay. The bed was sampled March 23, 1915, by F. R. Clark, as described below:

Sections of coal bed in Bear Wallow mine.

Section	A		B		C	
Laboratory No.	21673		21674		21675	
Roof, sandy shale and sandstone.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Bone	..	..	..	..	[a] 1	½
Coal, intermixed with "rash"	..	..	..	..	1	½
Coal, bright, massive, and hard	1	11	2	4	10	
"Rash"	..	..	..	..	[a] 1	
Coal, dull and hard		1	..	..	..	..
Coal, bright and hard		6	..	..	1	10
Floor, clay.						
Thickness of bed	2	6	2	4	3	0
Thickness of coal sampled	2	6	2	4	2	9½

[a] Not included in sample.

Section A (sample 21673) was measured at face of main entry, 3,000 feet S. 85° W. of mine mouth. Section B (sample 21674) was measured at face of 9 left entry, 2,200 feet S. 85° W., and 1,000 feet S. 5° E. of mine mouth. Section C (sample 21675) was measured at face of 6 room, 7 right entry, 2,050 feet S. 85° W. ,and 900 feet N. 5° W. of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 21673, 21674, and 21675 is given under laboratory No. 21676.

Caryville. Caryville Mine.

Analyses 21659 to 21663 (p. 85). Bituminous coal, from Caryville mine, a drift mine 1½ miles northwest of Caryville on the Southern Ry. Coal bed, Red Ash; Carboniferous age, Scott shale (?). The bed was sampled March 20, 1915, by F. R. Clark, as described below:

Sections of coal bed in Caryville mine.

Section	A		B		C		D	
Laboratory No.	21659		21660		21661		21662	
Roof, sandy shale.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
"Rash" and coal	[a] 3		..	..	..	..	[a] 2	
Coal "rashy"	..	..		3	..	..	..	..
Coal, bright, massive, and hard	1	4	1	3½	1	6	1	9
Coal, "rashy"		1	..	..	..	..	..	..
Shale and "rash"	..	..	[a] 1		[a] ½		[a] ⅜	
Coal, bright and blocky	1	11	1	8	1	10½	1	9
Clay, locally containing some coal	[a] 4		[a] 6		[a] 2		[a] 2	
Coal	[a] 2		..	..	[a] 1		[a] 1	
Floor, clay.								
Thickness of bed	4	1	3	9½	3	8	3	11⅜
Thickness of coal sampled	3	4	3	2½	3	4½	3	6

[a] Not included in sample.

Section A (sample 21659) was measured at face of 6 room, 4 right entry, 1,150 feet west of mine mouth. The sample was wet. Section B (sample 21660) was measured at

face of 3 room, 10 left entry, 1,850 feet S. 75° W. of mine mouth. Section C (sample 21661) was measured at face of 5 room, 15 left entry, 3,275 feet S. 75° W. of mine mouth. Section D (sample 21662) was measured at face of 3 room, 15 right entry, 3,875 feet west of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 21659, 21660, 21661, and 21662 is given under laboratory No. 21663.

Caryville. Pee Wee Mine.

Analyses 21677 to 21679, inclusive (p. 85). Bituminous coal, from Pee Wee mine, a small drift mine 1½ miles southwest of Caryville on the Southern Ry. Coal bed, Lower Dean; Carboniferous age, Scott shale (?). The bed was sampled by F. R. Clark on March 19, 1915, as described below:

Sections of coal bed in Pee Wee mine.

Section	A	B
Laboratory No	21677	21678
Roof, sandy shale.		
Coal	3 ½	2 10
"Rash"	[a] 4	[a] 2
Clay	.. ..	[a] 5
Coal	.. ..	2
Clay	.. ..	[a] 5½
"Rash"	.. ..	[a] ½
Coal, bright	.. ..	5
Floor, clay.		
Thickness of bed	3 4½	4 6
Thickness of coal sampled	3 ½	3 5

[a] Not included in sample.

Section A (sample 21677) was measured in 1 room, main haulage way, 150 feet southwest, 100 feet south, 700 feet east, and 450 feet northeast of mine mouth. Section B (sample 21678) was measured at face of 4 right entry, 150 feet southwest, 100 feet south, and 700 feet southwest of mine mouth.

The ultimate analysis of a composite sample made by fixing face samples 21677 and 21678 is given under laboratory No. 21679.

Caryville. Red Ash Mine.

Analyses 21668 to 21672 (pp. 85–86). Bituminous coal, from Red Ash mine, a drift mine 1¼ miles north-northwest of Caryville on the Southern Ry. Coal bed, Red Ash. Carboniferous age, Scott shale (?). The bed was sampled March 22, 1915, by F. R; Clark, as described below:

Sections of coal bed in Red Ash mine.

Section	A	B	C	D
Laboratory No	21668	21669	21670	21671
Roof, sandstone and sandy shale.				
Clay, interbedded with thin lenses of coal	[a] 1½	[a] 1	.. ..	.. ..
Coal, massive, bright, and hard	1 8	1 1	2 9½	3 3
Shale	[a] ½	.. ..	[a] 5	.. ..
Coal, intermixed with "rash"	.. ..	1	.. ..	.. ..
Coal, bright and hard	1 7	9	.. ..	.. ..
"Rash"	.. ..	[a] 3	.. ..	.. ..
Coal, bright and hard	.. ..	1 3	.. ..	.. ..
Floor, clay.				
Thickness of bed	3 5	3 6	3 2½	3 3
Thickness of coal sampled	3 3	3 2	2 9½	3 3

[a] Not included in sample.

Section A (sample 21668) was measured at face of 1 room, 15 right entry, 1 haulage way, 2,550 feet west of mine mouth. The sample was wet. Section B (sample 21669)

was measured at face of 9 left entry, 1 haulage way, 3,025 feet west of mine mouth. The sample was wet. Section C (sample 21670) was measured at face of 1 room, 7½ left entry, 2,050 feet west of mine mouth. Section D (sample 21671) was measured at face of 7 room, 4 right entry, 1,250 feet west and 1,400 feet north of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 21668, 21669, 21670, and 21671 is given under laboratory No. 21672.

Caryville. Sun Mine.

Analyses 21654, 21655, 21656, 21657, and 21658 (p. 86). Bituminous coal, from Sun mine, a drift mine 1½ miles southwest of Caryville, on the Southern Ry. Coal bed, Red Ash; Carboniferous age, Scott shale (?). Roof, sandy shale; floor, clay. The bed was sampled, March 19, 1915, by F. R. Clark, as described below:

Sections of coal bed in Sun mine.

Section	A	B	C	D
Laboratory No.	21654	21655	21656	21657
Roof, sandy shale.				
"Rash"	.. ..	[a] 2	.. ..	[a] 3
Bony coal	.. ..	[a] 2	.. ..	.. ..
Coal, massive, bright, and hard	1 4½	1 4	2 0	2 8
Clay	[a] 1	.. ..	[a] 2	[a] 1
Coal, dull and hard	.. ..	1	.. ..	.. ..
Coal, bright, hard, and massive	1 4½	2 1	1 3	1 0
Clay	[a] 3	[a] 4	[a] 4	[a] 3½
Coal, bright and hard	1½	2	2	2
Floor, clay.				
Thickness of bed	3 2½	4 4	3 11	4 5½
Thickness of coal sampled	2 10½	3 8	3 5	3 10

[a] Not included in sample.

Section A (sample 21654) was measured at face of 30 room, 10 right entry, 2,500 feet north-northwest, 1,400 feet north-northeast, 550 feet east-southeast, and 50 feet south of mine mouth. Section B (sample 21655) was measured at face of 17 right entry, 4,000 feet west and 900 feet north of mine mouth. Section C (sample 21656) was measured at face of 14 left entry, 2,900 feet west, 1,300 feet south, and 100 feet west of mine mouth. Section D (sample 21657) was measured at face of 5 room, 17 left entry, 3,700 feet west, and 200 feet south of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 21654, 21655, 21656, and 21657 is given under laboratory No. 21658.

Chaska. Chaska Mine.

Analyses 21811 to 21814 (p. 86). Bituminous coal, from Chaska mine, a drift mine 3,600 feet southeast of Chaska on the Louisville & Nashville R. R. Coal bed, Rich Mountain; Carboniferous age, Briceville shale. Roof, shale; floor, clay. The bed was sampled April 1, 1915, by F. R. Clark, as described below:

Sections of coal bed in Chaska mine.

Section	A	B	C
Laboratory No.	21811	21812	21813
Roof, shale.			
Coal, bright, massive, and hard	2 6	2 8	2 8
Clay	[a] 10	.. ..	.. ..
Coal, hard and blocky	10	.. ..	.. ..
Floor, clay.			
Thickness of bed	4 2	2 8	2 8
Thickness of coal sampled	3 4	2 8	2 8

[a] Not included in sample.

Section A (sample 21811) was measured at pillar, main entry, 400 feet east of mine mouth. Section B (sample 21812) was measured in 1 room, 1 right entry, 300 feet southeast of mine mouth. Section C (sample 21813) was measured in main entry on panhandle side, 600 feet southwest of mine mouth. The sample was wet.

The ultimate analysis of a composite sample made by mixing face samples 21811, 21812, and 21813 is given under laboratory No. 21814.

Coal Creek. Cambria Mine.

Analyses 21650 to 21653, inclusive (p. 87). Bituminous coal, from Cambria mine, a drift mine 4 miles north-northwest of Coal Creek, on the Southern and the Louisville & Nashville Railroads. Coal bed, Coal Creek; Carboniferous age, Briceville shale. Roof, sandy shale; floor, clay. The bed was sampled by F. R. Clark on March 15, 1915. Sample 21650 was collected at face of 1 room, 16 left entry, 5,280 feet N. 18° W. and 100 feet S. 72° W. of mine mouth, and represented 3 feet 4½ inches of massive hard coal containing bands of dull coal. Sample 21651 was collected at face of 5 room, 17½ right entry, 5,280 feet N. 18° W. and 500 feet N. 72° E. of mine mouth, and represented 2 feet 10 inches of massive hard coal with thin bands of dull coal. The section included 2 inches of "rash" which was excluded from the sample. Sample 21652 was collected on 8 and 9 pillars, 21 left entry, 6,280 feet N. 18° W. and 500 feet S. 72° W. of mine mouth, and represented 3 feet 2 inches of massive hard coal containing thin bands of dull coal entire thickness of bed.

The ultimate analysis of a composite sample made by mixing face samples 21650, 21651, and 21652 is given under laboratory No. 21653.

Cotula (Gatliff P. O.). Southern Mine.

Analyses 21687 to 21689 (p. 87). Bituminous coal, from Southern mine, a drift mine 2,000 feet west of Cotula, on the Louisville & Nashville R. R. Coal bed, Jordan; Carboniferous age, Wartburg sandstone. Roof, shale; floor, clay. The bed was sampled March 27, 1915, by F. R. Clark, as described below:

Sections of coal bed in Southern mine.

Section	A	B
Laboratory No.	21687	21688
Roof, sandy shale.	Ft. in.	Ft. in.
Coal, bright and blocky	11	9
Coal, intermixed with "rash"	2	.. ..
"Rash"	.. ..	[a] 2
Coal, massive and bright	.. ..	8½
"Rash" and mineral charcoal	.. ..	[a] 1
Coal, bright, hard, and blocky	3 6	2 5
Floor, clay.		
Thickness of bed	4 7	4 1½
Thickness of coal sampled	4 7	3 10½

[a] Not included in sample.

Section A (sample 21687) was measured in 4 room, A entry, 1,200 feet S. 20° W. of mine mouth. Section B (sample 21688) was measured at face of 1 room, main entry, 75 feet southwest of mouth of E entry, 1,700 feet S. 60° W. of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 21687 and 21688 is given under laboratory No. 21689.

Cotula. Wynn Mine.

Analyses 21690 to 21693 (p. 87). Bituminous coal, from Wynn mine, a drift mine 1 mile south of Cotula on the Louisville & Nashville R. R. Coal bed, Rich Mountain; Carboniferous age, Briceville shale. Average thickness, 3 feet. Roof,

shale; floor, clay. The bed was sampled, March 27, 1915, by F. R. Clark, as described below:

Sections of coal bed in Wynn mine.

Section	A	B	C
Laboratory No	21690	21691	21692
Roof, shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal, massive, hard, and blocky	1 4	1 2	1 3
"Rash"	[a] 5	[a] 2	[a] 3
Coal, massive, bright, and blocky	1 4	8	.. ..
Coal, containing knife-blade lenses of mineral charcoal	.. ..	1	.. ..
Coal, bright and hard	.. ..	1 2	1 3
"Rash"	.. ..	.. ..	[a] 4
Floor, clay.			
Thickness of bed	3 1	3 3	3 1
Thickness of coal sampled	2 8	3 1	2 6

[a] Not included in sample.

Section A (sample 21690) was measured at face of 36 room, 2 left entry, 250 feet west, 4,000 feet south, and 50 feet west of mine mouth. Section B (sample 21691) was measured at face of 5 right entry, 1,000 feet west, 1,300 feet south, 400 feet west, and 250 feet north of mine mouth. Section C (sample 21692) was measured at face of main entry, 1,000 feet west, 1,300 feet south, and 650 feet west of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 21690, 21691, and 21692 is given under laboratory No. 21693.

Elk Valley. Elkhart Mine.

Analyses 22015 to 22017 (p. 87). Bituminous coal from Elkhart mine, a drift mine three-quarters of a mile northwest of Elk Valley on the Southern Ry. Coal bed, Blue Gem; Carboniferous age, Briceville shale. Roof, sandy shale; floor, clay. The bed was sampled April 15, 1915, by F. R. Clark. Sample 22015 was taken at face of 2 left entry, 1,200 feet west-southwest of mine mouth, and represented 1 foot 7 inches of massive hard coal entire thickness of bed. Sample 22016 was taken at face of 8 room, 2 left entry, 700 feet west-southwest of mine mouth, and represented 1½ feet of massive hard coal entire thickness of bed.

The ultimate analysis of a composite sample made by mixing face samples 22015 and 22016 is given under laboratory No. 22017.

Elk Valley. Elk Valley Mine.

Analyses 22018 to 22020 (p. 87). Bituminous coal, from Elk Valley mine, a drift mine 1 mile northwest of Elk Valley on the Southern Ry. Coal bed, Blue Gem; Carboniferous age, Briceville shale. Roof, sandy shale; floor, clay. The bed was sampled April 15, 1915, by F. R. Clark. Sample 22018 was collected at face of main entry, 900 feet north of mine mouth, and represented 1 foot 7 inches of massive hard coal entire thickness of bed. Sample 22019 was measured at face of mud entry 300 feet north-northeast of mine mouth, and represented 1 foot 5½ inches of massive hard coal entire thickness of bed.

The ultimate analysis of a composite sample made by mixing face samples 22018 and 22019 is given under laboratory No. 22020.

Elk Valley. Perkins Branch Mine.

Analyses 22012 to 22014 (p. 87). Bituminous coal, from Perkins Branch mine, a drift mine 1½ miles northwest of Elk Valley on the Southern Ry. Coal bed, Buel Gem; Carboniferous age, Briceville shale. Roof, sandy shale; floor, clay. The bed was sampled April 15, 1915, by F. R. Clark, as described on page following.

Sections of coal bed in Perkins Branch mine.

Section	A	B
Laboratory No.	22012	22013
Roof, sandy shale.		
Coal, massive, hard, and brittle	Ft. in. 1 0	Ft. in. 1 7½
Coal, containing thin bands of "sulphur"	1	.. ..
Coal, massive, hard, and brittle	6	.. ..
Floor, clay.		
Thickness of bed	1 7	1 7½
Thickness of coal sampled	1 7	1 7½

Section A (sample 22012) was measured at face of 1 right entry, 700 feet west of mine mouth. Section B (sample 22013) was measured at face of 2 right entry, 700 feet west-southwest of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 22012 and 22013 is given under laboratory No. 22014.

Habersham. Davis Creek Mine.

Analysis 21825 (p. 87). Bituminous coal, from Davis Creek mine, a drift mine one-half mile north of Habersham (Cupp P. O.) on the Louisville & Nashville R. R. Coal bed, Jellico; Carboniferous age, Briceville shale (?). Roof, sandy shale; floor, clay. The bed was sampled March 31, 1915, by F. R. Clark, as described below:

Section of coal bed in Davis Creek mine.

	Ft. in.
Roof, sandy shale.	
Coal, bright and blocky	1 3
Clay	[a] 10
"Rash," intermixed with clay	[a] 9
Clay	[a] 11
Coal, bright and blocky	2 2½
Floor, clay.	
Thickness of bed	5 11½
Thickness of coal sampled	3 5½

[a] Not included in sample.

The sample was measured at face of 3 right entry, 1,500 feet southeast and 300 feet southwest of mine mouth.

Habersham. Old Davis Creek Mine.

Analysis 21826 (p. 87). Bituminous coal, from Old Davis Creek mine, a drift mine one-half mile north of Habersham (Cupp P. O.) on the Louisville & Nashville R. R. Coal bed, Jellico; Carboniferous age, Briceville shale (?). Roof, sandy shale; floor, clay. The bed was sampled March 31, 1915, by F. R. Clark, as described below:

Section of coal bed in Old Davis Creek mine.

	Ft. in.
Roof, sandy shale.	
Coal, bright and hard	10
Coal, soft and laminated	5
Clay	[a] 7
"Rash," intermixed with clay	[a] 4
Clay	[a] 9
Coal, bright and hard	2 4½
Floor, clay.	
Thickness of bed	5 3½
Thickness of coal sampled	3 7½

[a] Not included in sample.

The sample was measured at face of 5 left entry, 1,650 feet southeast and 250 feet northeast of mine mouth.

HABERSHAM. REMY MINE.

Analyses 21802 to 21805 (pp. 87–88). Bituminous coal, from Remy mine, a drift mine 2 miles southeast of Habersham on the Louisville & Nashville R. R. Coal bed, Rich Mountain; Carboniferous age, Briceville shale. Roof, sandy shale; floor, clay. The bed was sampled, March 29, 1915, by F. R. Clark, as described below:

Sections of coal bed in Remy mine.

Section	A	B	C
Laboratory No	21802	21803	21804
Roof, sandy shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*
Bone	[a] 8	.. ..	.. ..
Clay	[a] 8	.. ..	.. ..
Coal, massive and hard	2 4½	2 0	2 7
"Rash"	[a] 4	[a] 5	[a] 3
Floor, clay.			
Thickness of bed	4 ½	3 2	2 10
Thickness of coal sampled	2 4½	2 9	2 7

[a] Not included in sample.

Section A (sample 21802) was measured at face of 12 right entry, 3,100 feet from mine mouth. Section B (sample 21803) was measured at face of 13 left entry, 3,400 feet from mine mouth. Section C (sample 21804) was measured at face of 11½ left entry, 2,800 feet from mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 21802, 21803, and 21804 is given under laboratory No. 21805.

HABERSHAM (BENNETT P. O.). RICH MOUNTAIN MINE.

Analyses 21806 to 21810 (p. 88). Bituminous coal, from Rich Mountain mine, a drift mine 1 mile east of Habersham on the Louisville & Nashville R. R. Coal bed, Rich Mountain; Carboniferous age, Briceville shale. Roof, sandy shale; floor, clay. The bed was sampled March 30, 1915, by F. R. Clark, as described below:

Sections of coal bed in Rich Mountain mine.

Section	A	B	C	D
Laboratory No	21806	21807	21808	21809
Roof, sandy shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal, massive, bright, and brittle	1 8	1 8	2 4	2 7
Coal, soft and laminated	6	10	.. ..	.. ..
"Rash" and shale intermixed	[a] 1½	.. ..	[a] 7	[a] 4
Coal, bright and brittle	1½	.. ..	3	6
Coal, intermixed with "rash"	.. ..	.. ..	[a] 7	[a] 2
Coal, bright and brittle	.. ..	.. ..	6	[a] 1
Clay and "rash"	.. ..	.. ..	[a] 3	.. ..
Floor clay.				
Thickness of bed	2 5	2 6	4 6	3 8
Thickness of coal sampled	2 3½	2 6	3 1	3 1

[a] Not included in sample.

Section A (sample 21806) was measured at face of 7 left entry, 2,150 feet S. 30° E. and 800 feet N. 60° E. of mine mouth. Section B (sample 21807) was measured at face of 4 left entry, 1,200 feet S. 30° E. and 1,300 feet N. 60° E. of mine mouth. Section C (sample 21808) was measured at face of 8 right entry, 2,450 feet S. 30° E. and 400 feet S. 60° W. of mine mouth. Section D (sample 21809) was measured at face of 9 left entry, 2,650 feet S. 30° E. and 200 feet N. 60° E. of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 21806, 21807, 21808, and 21809 is given under laboratory No. 21810.

JELLICO. BLACK MINE.

Analysis 22000 (p. 88). Bituminous coal, from Black mine, a small drift mine 1½ miles east-southeast of Jellico on the Southern and the Louisville & Nashville Railroads. Coal bed, Blue Gem; Carboniferous age, Briceville shale (?). Roof, shale; floor, clay. The bed was sampled by F. R. Clark on April 12, 1915. The sample was collected at face of main entry, 300 feet north-northeast of mine mouth, and represented 2 feet of coal, of which 1¾ feet were massive and hard and 3 inches were laminated.

The coal is mined to supply a local demand at Jellico.

JELLICO. BLUE GEM MINE.

Analyses 21924 to 21927 (p. 88). Bituminous coal, from Blue Gem mine, a drift mine 1 mile south of Jellico on the Southern and the Louisville & Nashville Railroads. Coal bed, Blue Gem; Carboniferous age, Briceville shale (?). Roof, shale; floor, clay. The bed was sampled April 10, 1915, by F. R. Clark. Sample 21924 was collected at face of Pine Mountain left entry, 160 feet southeast of the entry mouth, and represented 2 feet 2 inches of coal, which was lustrous, hard, and brittle. The section included 1 inch of "rash," which was excluded from the sample. Sample 21925 was collected at face of Pine Mountain right entry, 200 feet southwest of the entry mouth, and represented 2 feet of lustrous, hard, brittle coal, entire thickness of bed. Sample 21926 was collected at face of 2 right entry, Crouch Creek entry, 450 feet west of the mouth, and represented 1½ feet of lustrous, hard coal, entire thickness of bed.

The ultimate analysis of a composite sample made by mixing face samples 21924, 21925, and 21926 is given under laboratory No. 21927.

JELLICO. BRAUGHTON MINE.

Analyses 21836 to 21838 (p. 89). Bituminous coal, from Braughton mine, a small drift mine ½ mile east of Jellico on the Southern and the Louisville & Nashville Railroads. Coal bed, Blue Gem; Carboniferous age, Briceville shale (?). Roof, sandy shale; floor, clay. The bed was sampled April 2, 1915, by F. R. Clark. Sample 21836 was taken at face of main entry, 1,600 feet south-southeast of mine mouth, and represented 1 foot 5 inches of massive, brittle coal. Sample 21837 was taken at face of last room, main entry, 1,200 feet southeast of mine mouth, and represented 2 feet 2 inches of massive, brittle coal.

The ultimate analysis of a composite sample made by mixing face samples 21836 and 21837 is given under laboratory No. 21838.

JELLICO. EVANS MINE.

Analyses 22001 to 22003 (p. 89). Bituminous coal, from Evans mine, a drift mine 1½ miles south of Jellico on the Southern and the Louisville & Nashville Railroads. Coal bed, Blue Gem; Carboniferous age, Briceville shale (?). Roof, shale; floor, clay. The bed was sampled April 10, 1915, by F. R. Clark. Sample 22001 was taken at face of 10 room, 3 left entry, 300 feet south of mine mouth, and represented 1 foot 10 inches of coal, which was lustrous, hard, and brittle. Sample 22002 was taken at face of 7 room, 4 left entry, 600 feet southwest of mine mouth, and represented 1 foot 11 inches of coal, which was lustrous, hard, and brittle. The section included 1 inch of rash, which was excluded from the sample.

The ultimate analysis of a composite sample made by mixing face samples 22001 and 22002 is given under laboratory No. 22003.

JELLICO. INDIAN MOUNTAIN NOS. 1, 2, 3, AND 5 MINES.

Analyses 21831 to 21835 (p. 89). Bituminous coal, from Indian Mountain Nos. 1, 2, 3, and 5 mines, drift mines 2½ miles west of Jellico on the Southern and the Louisville & Nashville Railroads. Coal bed, Jellico; Carboniferous age, Briceville shale(?). Roof, sandy shale; floor, clay. The bed was sampled April 2, 1915, by F. R. Clark, as described below:

Sections of coal bed in Indian Mountain Nos. 1, 2, 3, and 5 mines.

Section	A	B	C	D
Laboratory No.	21831	21832	21833	21834
Roof, sandy shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Bone	[a] 2	.. ..	.. ..	.. ..
Coal, bright, blocky, and brittle	3 1	3 8	2 11	2 2
Bone	.. ..	.. ..	[a] 1	.. ..
Coal, "rashy"	.. ..	.. ..	[a] 3	.. ..
Floor, clay.				
Thickness of bed	3 3	3 8	3 3	2 2
Thickness of coal sampled	3 1	3 8	2 11	2 2

[a] Not included in sample.

Section A (sample 21831) was measured on rib at mouth of Short Dog entry, 3 main entry, 1,000 feet southwest of mouth of No. 3 mine. Section B (sample 21832) was measured at face of 4 left entry, 1 main entry, 900 feet southeast of mouth of No. 1 mine. Section C (sample 21833) was measured at face of 2 left entry, 2 main entry, 700 feet southeast of mouth of No. 2 mine. Section D (sample 21834) was measured at face of 4 entry, 5 main entry, 1,200 feet southeast of mouth of No. 5 mine.

The ultimate analysis of a composite sample made by mixing face samples 21832, 21833, and 21834 is given under laboratory No. 21835.

JELLICO. JAMESON BLUE GEM MINE.

Analyses 21998 and 21999 (p. 89). Bituminous coal, from Jameson Blue Gem mine, a drift mine 3 miles south of Jellico on the Southern and the Louisville & Nashville Railroads. Coal bed, Blue Gem; carboniferous age, Briceville shale (?). Roof, sandy shale; floor, clay. The bed was sampled April 12, 1915, by F. R. Clark. Sample 21998 was measured at a rib, 150 feet north of mouth of 10 main entry, and represented 1 foot 11 inches of massive, hard coal, entire thickness of bed. The sample was wet. Sample 21999 was measured at face of 13 main entry, 650 feet south of mine mouth, and represented 1 foot 11 inches of massive, hard coal, entire thickness of bed.

KILSYTH. GEM NO. 2 AND NO. 4 MINES.

Analyses 21694 to 21698 (p. 89). Bituminous coal, from Gem No. 2 and No. 4 mines, drift mines 2 miles northeast of Kilsyth on the Louisville & Nashville R. R. Coal bed, Jordan; Carboniferous age, Wartburg sandstone. Roof, sandy shale; floor, clay. The bed was sampled March 25, 1915, by F. R. Clark, as described below:

Sections of coal bed in Gem No. 2 and No. 4 mines.

Section	A	B	C	D
Laboratory No.	21694	21695	21696	21697
Roof, sandy shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
"Rash"	[a] 1	.. ..	[a] 2	[a] 2
Coal, bright, massive, and hard	3 2½	3 5½	4 4	3 2
Shale, coal, and "rash" intermixed	[a] 4	[a] 8	.. ..	.. ..
Floor, clay.				
Thickness of bed	3 7½	4 1½	4 6	3 4
Thickness of coal sampled	3 2½	3 5½	4 4	3 2

[a] Not included in sample.

Section A (sample 21694) was measured at face of 2 right entry, 600 feet N. 11° W. and 550 feet N. 39° W. of mouth of No. 4 mine. Section B (sample 21695) was measured at face of 3 left entry, 1,050 feet N. 11° W. and 175 feet S. 79° W. of mouth of No. 4 mine. Section C (sample 21696) was measured at face of 2 room, 7 left entry, 1,450 feet N. 23° W., 1,300 feet N. 11° W., 180 feet S. 39° W., and 150 feet S. 11° E. of mouth of No. 2 mine. Section D (sample 21697) was measured at face of 8 right entry, 1,450 feet N. 23° W., 1,850 feet N. 11° W., and 150 feet N. 39° E. of mouth of No. 2 mine.

The ultimate analysis of a composite sample made by mixing face samples 21694, 21695, 21696, and 21697 is given under laboratory No. 21698.

KIMBERLY. KIMBERLY MINE.

Analyses 21821 to 21824 (p. 89). Bituminous coal, from Kimberly mine, a drift mine one-half mile east of Kimberly on the Louisville & Nashville R. R. Coal bed, Rich Mountain; Carboniferous age, Briceville shale. Roof, sandy shale; floor, clay. The bed was sampled March 31, 1915, by F. R. Clark, as described below:

Sections of coal bed in Kimberly mine.

Section	A	B	C
Laboratory No.	21821	21822	21823
Roof, sandy shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal, bright and blocky, locally contains thin lenses of "sulphur"	1 9	2 1	2 3½
"Rash"	[a] 1	[a] ½	[a] 1
Coal, bright and hard	7	7	6
"Rash"	[a] 2	.. ..	[a] 1
Floor, clay.			
Thickness of bed	2 7	2 8½	2 11½
Thickness of coal sampled	2 4	2 8	2 9½

[a] Not included in sample.

Section A (sample 21821) was measured at face of 10 left entry. Section B (sample 21822) was measured at face of 3 right entry, new main entry. Section C (sample 21823) was measured at face of 2 right entry, new main entry.

The ultimate analysis of a composite sample made by mixing face samples 21821, 21822, and 21823 is given under laboratory No. 21824.

LAFOLLETTE. REX NO. 1 MINE.

Analyses 17555, 17556, 17557, 17558, and 21699 to 21703 (Ann Arbor No. 10) (p. 90). Bituminous coal, from Rex No. 1 mine, a slope mine in the Big Creek district, 2 miles northeast of Lafollette on the Louisville & Nashville R. R. Coal bed, Rex; Carboniferous age, Briceville shale. Thickness, 3½ to 4 feet. Roof, "draw slate" and shale; floor, shale and clay; bed lies nearly horizontal. The bed was sampled by E. B. Sutton on July 14, 1913, as described below:

Sections of coal bed in Rex No. 1 mine.

Section	A	B	C
Laboratory No.	17555	17556	17557
Roof, "draw slate."	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	.. ..	6	9
"Rash"	.. ..	[a] 1	[a] 2
Coal	3 6	3 0	2 10
Floor, shale and clay.			
Thickness of bed	3 6	3 7	3 9
Thickness of coal sampled	3 6	3 6	3 7

[a] Not included in sample.

Section A (sample 17555) was measured at face of 1 main entry. Section B (sample 17556) was measured at face of 18 right entry, 1 right main entry. Section C (sample 17557) was measured at face of 15 right entry.

The ultimate analysis of a composite sample made by combining equal parts of samples 17555, 17556, and 17557 is given under laboratory No. 17558.

The bed was also sampled March 26, 1915, by F. R. Clark, as described below:

Sections of coal bed in Rex No. 1 mine.

Section	A		B		C		D	
Laboratory No.	21699		21700		21701		21702	
Roof, sandy shale and sandstone.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Bone		[a]1	..	..	..	..	..	..
Shale with thin lenses of coal	..	..		[a]4	..	..	..	..
Coal, cannel	..	..	..	..		[a]10	..	..
Coal, cannel-like	..	..	..	..	..	..		2
Coal, bright	..	..	..	..		[a]5	..	..
Shale	..	..	..	..	[a]2	2	..	..
Coal, soft, containing lenses of pyrite	..	..	..	..	..	..		10
Coal, bright and brittle	3	10	2	7	2	9	2	8
"Rash"		[a]1	..	..	..	..	..	..
Floor, clay.								
Thickness of bed	4	0	2	11	6	2	3	8
Thickness of coal sampled	3	10	2	7	2	9	3	8

[a] Not included in sample.

Section A (sample 21699) was measured at face of 1 left entry, 4,500 feet N. 37° W., 1,325 feet N. 24° E., and 800 feet N. 66° W. of mine mouth. Section B (sample 21700) was measured at face of main entry, 4,500 feet N. 37° W., and 2,550 feet N. 66° W. of mine mouth. Section C (sample 21701) was measured at the face of 2 right entry, 2,400 feet N. 37° W., 2,125 feet N. 53° E., 1,875 feet N. 24° E., and 1,775 feet S. 66° E. of mine mouth. Section D (sample 21702) was measured at face of 2 left main entry, 2,400 feet N. 37° W., 2,125 feet N. 53° E., 1,875 feet N. 24° E., and 2,900 feet N. 66° W. of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 21699, 21700, 21701, and 21702 is given under laboratory No. 21703.

The mine is worked on the panel system. In 1913 part of the coal was undercut by electric machines and broken down with permissible explosives. Dynamite was used for brushing the floor and roof. The mine produced about 600 tons per day, the coal being passed over the screens as follows: Bar screen 12 feet long with 5-inch openings, bar screen 12 feet long with 3-inch openings, shaking screens 12 feet long and 4 feet wide with 1½-inch and 3-inch perforations. About 40 per cent of the coal passed through the screens. Three pickers were employed on the cars. There were two loading tracks.

Lafollette. Rex No. 2 Mine.

Analyses 17544, 17552, 17553, and 17554 (Ann Arbor No. 10) (p. 90). Bituminous coal, Cumberland Plateau field, from Rex No. 2 mine, 1 mile northwest of Lafollette on the Louisville & Nashville R. R., and the Southern Ry. Coal bed, Rex; Carboniferous age, Briceville shale. Average thickness, 42 inches; dip, almost horizontal. Roof, "draw slate"; floor, shale and underclay. The bed was sampled by E. B. Sutton on July 12, 1913, as described below:

Sections of coal bed in Rex No. 2 mine.

Section	A		B		C	
Laboratory No.	17544		17552		17553	
Roof, "draw slate."	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Coal	2	1	2	5	3	3
Coal, "rashy"		8	[a]1	9	..	..
Floor, shale and clay.						
Thickness of bed	2	9	4	2	3	3
Thickness of coal sampled	2	9	2	5	3	3

[a] Not included in sample.

Section A (sample 17544) was measured at face of 3 left main entry. Section B (sample 17552) was measured at face of 2 left main entry. Section C (sample 17553) was measured at face of 6 right entry, 3 left main entry.

The ultimate analysis of a composite sample made by combining an equal amount of samples 17552 and 17553 is given under laboratory No. 17554.

The mine is opened by a slope and worked by the panel system. In 1913 the coal was undercut with puncher machines and broken down with black powder or permissible powder, dynamite being used for brushing floor and roof. The production of the mine averaged 600 tons a day with a maximum day's run of 800 tons. The coal was all screened as follows: Over bars 12 feet long with 5-inch openings, bars 12 feet long with 3-inch openings, shaker screens 12 feet long by 4 feet wide with holes 1½ to 3 inches. About 40 per cent of the coal passed through the screens. The screenings were coked. Three pickers were employed on the cars. There were two loading tracks.

Morley. Red Moon Mine.

Analyses 21827 to 21830 (pp. 90–91). Bituminous coal from Red Moon mine, a drift mine 1½ miles southeast of Morley on the Louisville & Nashville R. R. Coal bed, Jellico; Carboniferous age, Briceville shale (?). Roof, shale; floor, clay. The bed was sampled April 1, 1915, by F. R. Clark, as described below:

Sections of coal bed in Red Moon mine.

Section	A	B	C
Laboratory No.	21827	21828	21829
Roof, sandy shale and sandstone.			
Shale, with thin lenses of coal interbedded	[a] 1 3	.. ..	[a] 1 3
Coal, bony	.. ..	.. ..	[a] 1½
"Rash" and coal intermixed	.. ..	.. ..	[a] 2
Coal, massive, bright, and brittle	2 9	2 7	2 7½
Floor, clay.			
Thickness of bed	4 0	2 7	4 2
Thickness of coal sampled	2 9	2 7	2 7½

[a] Not included in sample.

Section A (sample 21827) was measured at face of 3 main south entry, 1,900 feet southwest of mine mouth. The sample was damp. Section B (sample 21828) was measured at face of 3 main north entry, 1,800 feet southwest of mine mouth. The sample was damp. Section C (sample 21829) was measured at face of 1 right entry, 1,950 feet southwest of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 21827, 21828, and 21829 is given under laboratory No. 21830.

Newcomb. Brummitt Mine.

Analysis 21996 (p. 91). Bituminous coal, from Brummitt mine, a drift mine 1½ miles west of Newcomb on the Southern Ry. Coal bed, Blue Gem; Carboniferous age, Briceville shale (?). Roof, sandy shale; floor, clay. The sample was cut April 14, 1915, by F. R. Clark from the rib of the main entry 100 feet west of the mine mouth, and represented 19 inches of massive, hard, weathered coal.

Newcomb. Jellico Cannel Mine.

Analysis No. 21997 (p. 91). Cannel coal, from Jellico cannel mine, a drift mine 2 miles west of Newcomb on the Southern Ry. Coal bed, not named; Carboniferous age, formation not identified. The bed was sampled April 14, 1915, by F. R. Clark, as described on page following.

Section of coal bed in Jellico cannel mine.

	Ft.	in.
Roof, sandstone.		
Shale, bituminous	[a]	10
Bone	[a]	½
Coal, cannel	2	1½
Clay	[a]	½
Shale, bituminous	[a]	1¾
Coal, cannel		7
Floor, clay.		
Thickness of bed	3	9
Thickness of coal sampled	2	8½

[a] Not included in sample.

The section was measured on rib on main entry opposite 3 left entry, 300 feet north-northeast and 720 feet west-northwest of mine mouth.

Newcomb. Marion-Anna Mine.

Analyses 22004 to 22007 (p. 91). Bituminous coal from Marion-Anna mine, a drift mine 3 miles north-northwest of Newcomb on the Southern Ry. Coal bed, Jellico; Carboniferous age, Briceville shale (?). The bed was sampled by F. R. Clark on April 13, 1915, as described below:

Sections of coal bed in Marion-Anna mine.

Section	A		B		C	
Laboratory No.	22004		22005		22006	
Roof, sandy shale.	Ft.	in.	Ft.	in.	Ft.	in.
Bone	[a]	4	[a]	2	[a]	1
Coal, bright and brittle		4		9		10
Coal, dull		1½	..	..	..	..
Coal, bright and hard		4½	..	..	..	..
Coal "rashy"	..	..		2	..	..
Coal, bony and "rashy"	[a]	4	..	..	[a]	2
Clay, containing "sulphur" balls	[a]	4	[a]	6	[a]	2
"Rash" and coal	..	..	..	..	[a]	3½
Clay	..	..	..	..	[a]	5
Coal, massive and hard [b]	1	6	1	4	1	8
Floor, clay.						
Thickness of bed	3	4	2	11	3	7½
Thickness of coal sampled	2	4	2	3	2	6

[a] Not included in sample. [b] Brittle in sample 22006.

Section A (sample 22004) was measured at face of 1 right entry, 3,000 feet west of mine mouth. Section B (sample 22005) was measured on pillar, T right entry, 3,200 feet west-northwest of mine mouth. Section C (sample 22006) was measured on pillar, 3 main entry, 3,400 feet west-northwest of mine mouth.

The ultimate analysis of composite sample made by mixing face samples 22004, 22005, and 22006 is given under laboratory No. 22007.

Newcomb. Old Italian Blue Gem Mine.

Analyses 21928 to 21930 (p. 91). Bituminous coal from Old Italian Blue Gem mine, a drift mine 1½ miles northeast of Newcomb on the Southern Ry. Coal bed, Blue Gem; Carboniferous age, Briceville shale (?). The bed was sampled April 12, 1915, by F. R. Clark, as described on page following.

Sections of coal bed in Old Italian Blue Gem mine.

Section	A	B
Laboratory No.	21928	21929
Roof, sandy shale.	*Ft. in.*	*Ft. in.*
Coal, massive	2	.. ..
"Mother coal"	½	.. ..
Coal, massive and hard	1 3	2 1
Floor, clay.		
Thickness of bed	1 5½	2 1
Thickness of coal sampled	1 5½	2 1

Section A (sample 21928) was measured at face of Ben Vicar entry, 4 right entry, 875 feet east-southeast, 190 feet south-southwest, and 150 feet west-northwest of mine mouth. Section B (sample 21929) was measured at face of 3 left entry, old main entry, 775 feet east-northeast and 800 feet north-northeast of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 21928 and 21929 is given under laboratory No. 21930.

Newcomb. Washington Blue Gem Mine.

Analyses 21931, 21932, and 21933 (p. 91). Bituminous coal from Washington Blue Gem mine, a drift mine 1½ miles north of Newcomb on the Southern Ry. Coal bed, Blue Gem; Carboniferous age, Briceville shale (?). The bed was sampled on April 13, 1915, by F. R. Clark, as described below:

Sections of coal bed in Washington Blue Gem mine.

Section	A	B
Laboratory No.	21931	21932
Roof, sandy shale.	*Ft. in.*	*Ft. in.*
Coal, massive and hard	9	.. ..
Mineral charcoal and "sulphur" interbedded	*a* ¾	.. ..
Coal, massive and hard	11	1 10
Floor, coal.		
Thickness of bed	1 8¾	1 10
Thickness of coal sampled	1 8	1 10

a Not included in sample.

Section A (sample 21931) was measured at face of 6 break-through, main tunnel entry, 700 feet west-southwest of mine mouth. Section B (sample 21932) was measured at face of 1 left entry, 800 feet west-southwest of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 21931 and 21932 is given under laboratory No. 21933.

Newcomb. Zechini Mine.

Analyses 22008 to 22011 (p. 91). Bituminous coal, from Zechini mine, a drift mine 2½ miles west of Newcomb on the Southern Ry. Coal bed, Jellico; Carboniferous age Briceville shale (?). The bed was sampled on April 14, 1915, by F. R. Clark, as described below:

Sections of coal bed in Zechini mine.

Section	A	B	C
Laboratory No.	22008	22009	22010
Roof, sandy shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal, laminated	.. ..	2	2
Bone	.. ..	*a* ½	*a* 1
Coal, massive, lustrous and hard *b*	2 1	1 8	1 9
Clay	*a* 9	.. ..	*a* 4
Coal, impure	*a* 3	.. ..	*a* 6
Floor, clay.			
Thickness of bed	3 1	1 10½	2 10
Thickness of coal sampled	2 1	1 10	1 11

a Not included in sample. *b* Brittle in sample 22010.

Section A (sample 22008) was measured at face of Vaughn entry, 500 feet N. 20° W. of mine mouth. Section B (sample 22009) was measured at face of main east entry, 400 feet N. 65° W. of mine mouth. Section C (sample 22010) was measured at face of main west entry, 500 feet N. 55° W. of mine mouth.

The ultimate analysis of composite sample made by mixing face samples 22008, 22009, and 22010 is given under laboratory No. 22011.

Oswego. Falls Branch Mine.

Analyses 21839 to 21843 (pp. 91-92), bituminous coal from Falls Branch mine, a drift mine 2½ miles northwest of Oswego on the Southern Ry. Coal bed, Jellico; Carboniferous age, Briceville shale (?). The bed was sampled April 3, 1915, by F. R. Clark, as described below:

Sections of coal bed in Falls Branch mine.

Section	A	B	C	D
Laboratory No.	21839	21840	21841	21842
Roof, sandy shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal, bony, interbedded with "rash"	[a] 3	[a] 2	[a] 2	[a] 2
Coal, bright, blocky, and hard	10	2 11	3 1	2 9
Bone	[a] 2	.. ..	.. ..	.. ..
Coal, bright and hard	2 2	.. ..	.. ..	.. ..
Floor, clay.				
Thickness of bed	3 5	3 1	3 3	2 11
Thickness of coal sampled	3 0	2 11	3 1	2 9

[a] Not included in sample.

Section A (sample 21839) was measured at mouth of 1 room, 49½ entry, 2,500 feet northeast, 550 feet northwest, and 350 feet northeast of mine mouth. Section B (sample 21840) was measured at face of 1 room, 39 right entry, 2,500 feet northeast, 375 feet southeast, 125 feet northeast, and 100 feet southeast of mine mouth. Section C (sample 21841) was measured at face of 59 entry, 1,000 feet northeast, 1,200 feet northwest, and 800 feet northeast of mine mouth. Section D (sample 21842) was measured at face of 58 entry, 1,000 feet northeast, 1,550 feet northwest, and 900 feet northeast of mine mouth.

The ultimate analysis of composite sample made by mixing face samples 21840, 21841, and 21842 is given under laboratory No. 21843.

Oswego. Powhatan Mine.

Analyses 21871, 21872, and 21873 (p. 92). Bituminous coal from Powhatan mine, a drift mine one-half mile northwest of Oswego on the Southern Ry. Coal bed, Blue Gem; Carboniferous age, Briceville shale (?). Roof, sandy shale; floor, clay. The bed was sampled April 3, 1915, by F. R. Clark. Sample 21871 was collected at face of 10 entry, 3,100 feet northwest of mine mouth and represented 1 foot 10 inches of bright, hard coal. The section included 1½ inches of "rash," which was excluded from the sample, the bed being 1 foot 11½ inches thick at that point. Sample 21872 was collected at face of 10 room, 9 entry, 2,700 feet north-northwest of mine mouth, and represented 1 foot 10 inches of bright, hard coal, the thickness of the bed.

The ultimate analysis of composite sample made by mixing face samples 21871 and 21872 is given under laboratory No. 21873.

Turley. Rock Springs Mine.

Analyses 22021, 22022, 22023, and 22024 (p. 92). Bituminous coal from Rock Springs mine, a drift mine 1⅛ miles southwest of Turley on the Southern Ry. Coal bed, Upper Dean; Carboniferous age, Scott shale (?). The bed was sampled April 16, 1915, by F. R. Clark, as described on page following.

Sections of coal bed in Rock Springs mine.

Section	A		B		C	
Laboratory No.	22021		22022		22023	
	Ft.	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Roof, sandy shale.						
Coal, bright and laminated, with "sulphur" bands in some parts of the mine	1	2	1	2	1	2
Coal, dull and hard, bony in places		6		6		8
Shale		[a]3		[a]4		[a]4
Coal, massive and hard	2	5	2	4½	2	4
Floor, clay.						
Thickness of bed	4	4	4	4½	4	6
Thickness of coal sampled	4	1	4	½	4	2

[a] Not included in sample.

Section A (sample 22021) was measured at face of 2 main entry, 2,500 feet west-southwest of mine mouth. Section B (sample 22022) was measured at face of 4 right entry, 2,000 feet west of mine mouth. Section C (sample 22023) was measured at face of 8 room, 2 left entry, 1,800 feet southwest of mine mouth.

The ultimate analysis of composite sample made by mixing face samples 22021, 22022, and 22023 is given under laboratory No. 22024.

VASPER. DISNEY MINE.

Analysis 21664 (p. 92). Bituminous coal from Disney mine, a prospect drift 1½ miles southwest of Vasper on the Southern Ry. Coal bed, Frozen Head (?); Carboniferous age, Scott shale (?). The bed was sampled by F. R. Clark on March 18, 1915, as described below:

Section of coal bed in Disney prospect.

	Ft.	*in.*
Roof, sandstone.		
Shale, carbonaceous with knife-blade lenses of coal		[a]2
Clay		[a]2
"Rash"		[a]1
Coal, hard, bright, with thin dull bands	3	1
Clay		[a]1
Coal		2
Floor, clay.		
Thickness of bed	3	9
Thickness of sample	3	3

[a] Not included in sample.

The sample was measured at rib in main entry, 150 feet south of mine mouth, and represented weathered coal.

VASPER. VASPER MINE.

Analyses 21665, 21666, and 21667 (p. 92). Bituminous coal, from Vasper mine, a slope mine one-half mile west of Vasper on the Southern and the Louisville & Nashville Railroads. Coal bed, Coal Creek; Carboniferous age, Briceville shale. Roof, sandstone; floor, clay. The bed was sampled by F. R. Clark on March 18, 1915. Sample 21665 was taken at face of main entry, 1,400 feet southwest of mine mouth, and represented 3 feet 10½ inches of hard coal, entire thickness of bed. Sample 21666 was taken at face of 1 right entry, main entry, 800 feet west and 260 feet north of mine mouth, and represented 3 feet 4 inches of clean massive coal entire thickness of bed.

The ultimate analysis of a composite sample made by mixing face samples 21665 and 21666 is given under laboratory No. 21667.

CLAIBORNE COUNTY.

Bosworth, Ky. Yellow Creek No. 3 Mine.

Analyses 22087 to 22091 (p. 93). Bituminous coal, from Yellow Creek No. 3 mine, a drift mine 2,500 feet south-southwest of Bosworth (Ky.) on the Mingo branch of the Louisville & Nashville R. R. Coal bed, Billygoat; Carboniferous age, formation not identified. Roof, sandy shale; floor, sandstone. The bed was sampled April 28, 1915, by F. R. Clark, as described below:

Sections of coal bed in Yellow Creek No. 3 mine.

Section	A	B	C	D
Laboratory No.	22087	22088	22089	22090
Roof, sandy shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
"Rash" and clay	[a] 1	[a] ¾	.. ..	.. ..
Coal, bright	.. ..	.. ..	[a] 1	.. ..
Coal, impure and bony	.. ..	.. ..	[a] 1	.. ..
Coal, badly crushed	1 4½	.. ..	.. ..	.. ..
Coal, lustrous and brittle	.. ..	2 10	2 4	2 8
Coal, massive, lustrous, and hard	[a] 1 5	.. ..	.. ..	.. ..
Floor, sandstone.				
Thickness of bed	2 10½	2 10⅝	2 6	2 8
Thickness of coal sampled	1 4½	2 10	2 4	2 8

[a] Not included in sample.

Section A (sample 22087) was measured on chain pillar, 2 right entry, 600 feet S. 30° E. of mine mouth. Section B (sample 22088) was measured at face of 4 right entry, 1,150 feet S. 25° E. of mine mouth. Section C (sample 22089) was measured at face of main entry, 1,500 feet S. 45° E. of mine mouth. Section D (sample 22090) was measured at face of 5 left entry, 1,250 feet S. 70° E. of mine mouth.

The ultimate analysis of a composite sample made by mixing samples 22087, 22088, 22089, and 22090 is given under laboratory No. 22091.

Bryson. Bryson Mountain No. 1 Mine.

Analyses 22106 to 22109 (p. 93). Bituminous coal, from Bryson Mountain No. 1 mine, a drift mine at Bryson on the Mingo branch of the Louisville & Nashville R. R. Coal bed, Mingo; Carboniferous age, Mingo formation. Roof, shale and sandy shale; floor, clay. The bed was sampled April 22, 1915, by F. R. Clark, as described below:

Sections of coal bed in Bryson Mountain No. 1 mine.

Section	A	B	C
Laboratory No.	22106	22107	22108
Roof, shale and sandy shale.	Ft. in.	Ft. in.	Ft. in.
Clay	.. ..	.. ..	[a] 5
Coal, lustrous, laminated, and soft [b]	2 2	2 4	1 10½
"Rash" and lenses of coal	[a] 3	[a] 5	[a] 3
Shale and "sulphur"	[a] 1	[a] 4	.. ..
Coal and "sulphur" lenses	.. ..	[a] 1	.. ..
Coal, bright [b]	2 0	2 1½	7
Shale or clay	[a] ½	[a] 1	[a] 1
"Sulphur" bands	[a] ½	.. ..	.. ..
Coal, bright [b]	1½	1½	11
"Rash"	[a] 1	.. ..	[a] ½
Coal, "rashy" and crushed	.. ..	.. ..	6½
Shale and "rash"	.. ..	.. ..	[a] 1½
Coal, bright and hard	.. ..	.. ..	2
"Rash"	.. ..	.. ..	[a] ½
Floor, clay.			
Thickness of bed	4 0½	5 6	5 ½
Thickness of coal sampled	4 3½	4 7	4 1

[a] Not included in sample. [b] Coal badly crushed in sample 22108.

Section A (sample 22106) was measured on 16 stump, 3 cross entry, 3,400 feet S. 70° W. of mine mouth. Section B (sample 22107) was measured on the chain pillar, 1 cross entry, 2,600 feet S. 45° W. of mine mouth. Section C (sample 22108) was measured on the chain pillar, 5 cross entry, 3,800 feet S. 85° W. of mine mouth.

The ultimate analysis of a composite sample made by mixing samples 22106, 22107, and 22108 is given under laboratory No. 22109.

Bryson. Bryson Mountain No. 2 Mine.

Analysis 22105 (p. 93). Bituminous coal, from Bryson Mountain No. 2 mine, a drift mine 700 feet west of Bryson on the Mingo branch of the Louisville & Nashville R. R. Coal bed, Poplar Lick; Carboniferous age, Catron formation. Roof, sandy shale; floor, clay. The bed was sampled April 22, 1915, by F. R. Clark, as described below:

Section of coal bed in Bryson Mountain No. 2 mine.

	Ft.	in.
Roof, sandy shale.		
Coal, massive, blocky, and hard	3	8
Coal, "rashy"		2
Coal, massive, bright, and hard	1	2
Floor, clay.		
Thickness of bed	5	0
Thickness of coal sampled	5	0

The section was measured on rib in main entry, 500 feet west of mine mouth. The mine was not in operation at the time the sample was collected; it was therefore probably slightly weathered.

Clairfield. King Mountain Mine.

Analyses 21849 to 21852 (p. 93). Bituminous coal, from King Mountain mine, a drift mine three-fourths mile east of Clairfield on the Clearfork branch of the Southern Ry. Coal bed, Jellico; Carboniferous age, Briceville shale (?). Roof, shale; floor, clay. The bed was sampled April 7, 1915, by F. R. Clark, as described below:

Sections of coal bed in King Mountain mine.

Section	A		B		C	
Laboratory No.	21849		21850		21851	
Roof, shale.	Ft.	in.	Ft.	in.	Ft.	in.
"Rash"	[a]	1	[a]	2	[a]	1½
Coal, hard and dull [b]	1	6	3	0	1	6
Coal, bright, lustrous, and hard	1	7	..	..	1	7
"Rash"	..	..	[a]	3	..	..
Floor, clay.						
Thickness of bed	3	2	3	5	3	2½
Thickness of coal sampled	3	1	3	0	3	1

[a] Not included in sample. [b] Sample 21850 contained thin films of sulphur.

Section A (sample 21849) was measured at face of 3 room, 3 left entry, 1 left entry, 1,000 feet S. 50° E. of mine mouth. Section B (sample 21850) was measured at face of 1 room, 2 left entry, 1 right main entry, 1,850 feet S. 30° W. of mine mouth. Section C (sample 21851) was measured at face of 4 room, 1 left entry, 1 left main entry, 700 feet S. 25° E. of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 21849, 21850, and 21851 is given under laboratory No. 21852.

Clairfield. Standard Mine.

Analyses 21867 to 21870 (p. 93). Bituminous coal, from Standard mine, a drift mine 1 mile east of Clairfield on the Clearfork branch of the Southern Ry. Coal bed, Jellico; Carboniferous age, Briceville shale (?). Roof, shale; floor, clay. The bed was sampled April 8, 1915, by F. R. Clark, as described below:

Sections of coal bed in Standard mine.

Section	A	B	C
Laboratory No.	21867	21868	21869
Roof, shale.	Ft. in.	Ft. in.	Ft. in.
Bone and "rash," interbedded	[a] 4	.. ..	.. ..
Coal, massive, dull, and hard	1 3	8	.. ..
Coal, soft and "rashy"	2	.. ..	.. ..
Coal, lustrous, brittle, and hard	1 6	2 4	2 6
Floor, clay.			
Thickness of bed	3 3	3 0	2 6
Thickness of coal sampled	2 11	3 0	2 6

[a] Not included in sample.

Section A (sample 21867) was measured at face of 17 room neck, 1-C entry, 825 feet N. 5° W. of mine mouth. Section B (sample 21868) was measured at face of 20 room, 3-D entry, 2,100 feet N. 15° E. of mine mouth. Section C (sample 21869) was measured at face of 3-C entry, 1,100 feet N. 30° W. of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 21867, 21868, and 21869 is given under laboratory No. 21870.

Eagan. Buffalo Mine.

Analyses 21862 to 21866 (p. 93). Bituminous coal, from Buffalo mine, a drift mine three-fourths mile south of Eagan on the Clearfork branch of the Southern Ry. Coal bed, Jellico; Carboniferous age, Briceville shale (?). Roof, shale and sandy shale; floor, clay. The bed was sampled April 8, 1915, by F. R. Clark, as described below:

Sections of coal bed in Buffalo mine.

Section	A	B	C	D
Laboratory No.	21862	21863	21864	21865
Roof, shale or sandy shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
"Rash"	[a] 2	[a] ½	[a] ½	[a] 1½
Coal, bright, massive, and hard	2 10½	3 ½	3 1	3 1
Floor, clay.				
Thickness of bed	3 ½	3 1	3 1½	3 2½
Thickness of coal sampled	2 10½	3 ½	3 1	3 1

[a] Not included in sample.

Section A (sample 21862) was measured at face of 9 main entry, 3,250 feet south of mine mouth. Section B (sample 21863) was measured at face of 10 right entry, 2,400 feet south and 1,050 feet west of mine mouth. Section C (sample 21864) was measured at face of 8 right entry 2,000 feet south and 1,500 feet west of mine mouth. Section D (sample 21865) was measured at face of 6 right entry, 1,500 feet south and 1,600 feet west of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 21862, 21863, 21864, and 21865 is given under laboratory No. 21866.

Fork Ridge. Fork Ridge No. 1 Mine.

Analyses 22114 to 22118 (p. 94). Bituminous coal, from Fork Ridge No. 1 mine, a drift mine five-eighths mile southwest of Fork Ridge on the Mingo branch of the Louisville & Nashville R. R. Coal bed, Mingo; Carboniferous age, Mingo formation.

Roof, sandy shale; floor, clay. The bed was sampled April 26, 1915, by F. R. Clark, as described below:

Sections of coal bed in Fork Ridge No. 1 mine.

Section	A	B	C	D
Laboratory No.	22114	22115	22116	22117
Roof, sandy shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal, massive, hard, and blocky	.. ..	.. ...	10	2 2
Coal, lustrous and laminated	2 2	1 11½	1 6	.. ..
Shale and "rash" interbedded [b]	[a] 3	[a] 2½	[a] 1½	[a] 2
Coal, lustrous and laminated [c]	2 1	2 1½	2 5	2 2
Floor, clay.				
Thickness of bed	4 6	4 3½	4 10½	4 6
Thickness of coal sampled	4 3	4 1	4 9	4 4

[a] Not included in sample.
[b] Samples 22115 and 22117 contained sulphur.
[c] Sample 22117 contained bands of mineral charcoal.

Section A (sample 22114) was measured at face of 17 room, 1 right entry, 9,200 feet S. 45° E. of mine mouth. Section B (sample 22115) was measured at face of 11 room, 2 right entry, 8,900 feet S. 43° E. of mine mouth. Section C (sample 22116) was measured at face of 11 room, 3 left entry, 8,850 feet S. 48° E. of mine mouth. Section D (sample 22117) was measured at face of 15 room, 4 left entry, 9,300 feet S. 52° E. of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 22114 to 22117 is given under laboratory No. 22118.

Fork Ridge. Fork Ridge No. 4 Mine.

Analyses Nos. 22110 to 22113 (p. 94). Bituminous coal, from Fork Ridge No. 4 mine, a drift mine 1¼ miles southwest of Fork Ridge on the Mingo branch of the Louisville & Nashville R. R. Coal bed, Poplar Lick; Carboniferous age, Catron formation. Roof, sandy shale; floor, clay. The bed was sampled April 27, 1915, by F. R. Clark, as described below:

Sections of coal bed in Fork Ridge No. 4 mine.

Section	A	B	C
Laboratory No.	22110	22111	22112
Roof, sandy shale.	Ft. in.	Ft. in.	Ft. in.
Coal, bright and soft	8½	.. ..	8
Coal, massive	.. ...	1 6½	.. ..
Bone	[a] 1	[a] 3½	[a] 2
Coal, bright and soft	4	.. ...	5
Bone	[a] 8	.. ...	[a] 7
Coal, bony	6	.. ...	.. ..
Coal, massive, bright, and brittle	1 8	1 10½	2 1
"Rash"	.. ...	.. ...	[a] ½
Floor, clay.			
Thickness of bed	3 11½	3 8½	3 11½
Thickness of coal sampled	3 2½	3 5	3 2

[a] Not included in sample.

Section A (sample 22110) was measured at face of 1 right entry, 1 face entry, 2,400 feet west, 350 feet north, and 200 feet east of mine mouth. Section B (sample 22111) was measured at face of main entry, 2,500 feet west of mine mouth. Section C (sample 22112) was measured at face of 2 cross entry, 2,400 feet west, and 600 feet south of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 22110, 22111, and 22112 is given under laboratory No. 22113.

HARTRANFT. MINGO NO. 5 MINE.

Analyses 22097, 22098, 22099, and 22126 (p. 94). Bituminous coal, from Mingo No. 5 mine, a drift mine 1,500 feet southeast of Hartranft on the Mingo branch of the Louisville & Nashville R. R. Coalbed, Poplar Lick; Carboniferous age, Catron formation. Roof, sandy shale; floor, clay. The bed was sampled April 23, 1915, by F. R. Clark, as described below:

Sections of coal bed in Mingo No. 5 mine.

Section	A	B	C
Laboratory No.	22097	22098	22126
Roof, sandy shale.	Ft. in.	Ft. in.	Ft. in.
Coal, bright and laminated, locally containing "sulphur" bands	5	8	9½
Bone [b]	[a] 5	[a] 2½	[a] 2½
Coal, hard and dull	.. ..	1 0	10½
Coal, soft and crushed	.. ..	.. ..	4
Coal, massive and hard	3 4	2 0	2 0
"Rash"	.. ..	[a] 4	.. ...
Floor, clay.			
Thickness of bed	4 2	4 2½	4 2½
Thickness of coal sampled	3 9	3 8	4 0

[a] Not included in sample. [b] Sample 22097 contained "sulphur" bands.

Section A (sample 22097) was measured at face of 21 left entry, 3,600 feet S. 45° E. of mine mouth. Section B (sample 22098) was measured at face of 11 right entry, 3,200 feet S. 5° W. of mine mouth. Section C (sample 22126) was measured at face of 19 right entry, 3,700 feet S. 10° E. of mine mouth.

The results of an ultimate analysis of a composite sample made by mixing face samples 22097, 22098, and 22126 is given under laboratory No. 22099.

HARTRANFT. RELIANCE NO. 1 AND NO. 2 MINES.

Analyses 22120 to 22124 (pp. 94–95). Bituminous coal, from Reliance No. 1 and No. 2 mines, a drift mine at Hartranft on the Mingo branch of the Louisville & Nashville R. R. Coal bed, Mingo; Carboniferous age, Mingo formation. The bed was sampled April 24, 1915, by F. R. Clark, as described below:

Sections of coal bed in Reliance No. 1 and No. 2 mines.

Section	A	B	C	D
Laboratory No.	22120	22121	22122	22123
Roof, sandy shale and sandstone.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal, lustrous and usually laminated	2 0	1 11	2 2	1 6
Coal, "rashy"	.. ..	.. ..	.. ..	4
"Rash"	[a] 2	.. ...	[a] 2	.. ..
Shale and "rash" interbedded	[a] 6	[a] 5	[a] 9	[a] 1 6
Coal, lustrous and bedded, locally crushed	1 6	1 5½	1 4	1 4
Shale, with bands of "rash"	[a] 7	[a] 4½	[a] 4	[a] 6
Coal, bright and hard	3	5	4	3
"Rash"	.. ..	.. ..	.. ..	[a] 1
Floor, clay.				
Thickness of bed	5 0	4 7	5 1	5 6
Thickness of coal sampled	3 9	3 9½	3 10	3 5

[a] Not included in sample.

Section A (sample 22120) was measured on barrier pillar, main air course, 2,700 feet S. 40° W. of No. 2 mine mouth. Section B (sample 22121) was measured on 30 pillar, 27 right entry, 1,950 feet S. 25° W. of No. 2 mine mouth. Section C (sample 22122) was measured at new side track, 2 left entry, 500 feet N. 65° W. of No. 1 mine mouth. Section D (sample 22123) was measured in 1 room, 3 left entry, 750 feet N. 70° W. of No. 1 mine mouth.

The ultimate analysis of a composite sample made by mixing samples 22120 to 22123 is given under laboratory No. 22124.

HARTRANFT. SANDSTONE PARTING MINE.

Analysis 22119 (p. 95). Bituminous coal, from Sandstone Parting mine, a drift mine 900 feet west of Hartranft on the Mingo branch of the Louisville & Nashville R. R. Coal bed, Sandstone Parting; Carboniferous age, Mingo formation. Roof, sandstone; floor, shale. The bed was sampled April 24, 1915, by F. R. Clark, as described below:

Section of coal bed in Sandstone Parting mine.

	Ft.	in.
Roof, sandstone.		
Coal, splintlike		1½
Shale		[a] 2
Coal, blocky		2½
Shale and clay interbedded		[a] 11
Coal, massive, blocky, and hard	2	11
Floor, clay.		
Thickness of bed	4	4
Thickness of coal sampled	3	3

[a] Not included in sample.

The section was measured near face of 1 left entry, 500 feet S. 85° W. of mine mouth, and represented wet coal. The mine has not been operated for a considerable time, and therefore the coal was probably slightly weathered.

MANRING. STERLING MINE.

Analyses 22100 to 22104 (p. 95). Bituminous coal, from Sterling mine, a drift mine one-half mile west-southwest of Manring at the terminus of the Mingo branch of the Louisville & Nashville R. R. Coal bed, Poplar Lick; Carboniferous age, Catron formation. Roof, sandy shale and sandstone; floor, clay. The bed was sampled April 21, 1915, by F. R. Clark, as described below:

Sections of coal bed in Sterling mine.

Section	A		B		C		D	
Laboratory No.	22100		22101		22102		22103	
Roof, sandy shale and sandstone.	Ft.	in.	Ft.	in.	Ft.	in.	Ft.	in.
Coal, lustrous and brittle	--	--	--	--		4		5
Coal, lustrous, laminated, and "rashy"		9		6		9		8
Coal, bony		1	--	--	--	--	--	--
Coal, bright and hard	1	0		11		8	1	3
Coal, bony with bands of "sulphur"		1	--	--	--	--	--	--
Coal, dull and hard	--	--		4		8	--	--
Shale	--	--	--	--	--	--		[a] ½
Coal, massive and hard	2	8	2	6	1	8	2	8
Floor, clay.								
Thickness of bed	4	7	4	3	4	1	5	½
Thickness of coal sampled	4	7	4	3	4	1	5	0

[a] Not included in sample.

Section A (sample 22100) was measured at face of 6 left entry, 2 face entry, 6,400 feet west and 2,000 feet north of mine mouth. Section B (sample 22101) was measured at face of 2 entry, 4 right entry, 2 face entry, 5,500 feet west and 2,900 feet north of mine mouth. Section C (sample 22102) was measured at face of 1 room, 2 right entry, 2 face entry, 4,500 feet west and 2,800 feet north of mine mouth. Section D (sample 22103) was measured at face of 1 room, 3 left entry, 2 face entry, 5,600 feet west and 1,400 feet north of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 22100 to 22103 is shown under laboratory No. 22104.

PRUDEN. HIGH CLIFF MINE.

Analyses 21857 to 21861 (p. 95). Bituminous coal, from High Cliff mine, a drift mine one-half mile south of Pruden on the Clearfork branch of the Southern Ry.

Coal bed, Mingo; Carboniferous age, Mingo formation. Roof, shale; floor, clay. The bed was sampled April 6 and 7, 1915, by F. R. Clark, as described below:

Sections of coal bed in High Cliff mine.

Section	A	B	C	D
Laboratory No.	21857	21858	21859	21860
Roof, shale.				
Coal	a 1	a 1	2	a 1½
Clay	.. ..	a 2	a 3	a 3
"Rash"	a 2	a 1½	a 1	.. ..
Bone and lenses of coal interbedded	.. ..	.. ..	.. ..	a 2
Coal, bright and laminated	2 8	2 4	2 0	2 2
Clay and "rash," locally containing "sulphur" balls	a 4	a ½	a 1½	a 1
Coal, bright and lustrous	.. ..	2	5½	3
Clay, containing bands of coal and "sulphur" lenses	.. ..	a 8	a 5	a 4
Coal, massive and hard, with dull bands	2 6	2 11	2 11½	2 8
Floor, clay.				
Thickness of bed	5 9	6 6	6 5½	6 ½
Thickness of coal sampled	5 2	5 5	5 7	5 1

a Not included in sample.

Section A (sample 21857) was measured at face of main entry, 3,300 feet S. 45° E. of mine mouth. Section B (sample 21858) was measured at face of 5 room, 8 right entry, 2,900 feet S. 45° E. and 300 feet S. 45° W. of mine mouth. Section C (sample 21859) was measured at face of 6 room, 7 right entry, 2,530 feet S. 45° E. and 400 feet S. 45° W. of mine mouth. Section D (sample 21860) was measured at face of 5 room, 6 right entry, 2,160 feet S. 45° E. and 350 feet S. 45° W. of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 21857, 21858, 21859, and 21860 is given under laboratory No. 21861.

Pruden. Pruden Mine.

Analyses 21844 to 21848 (p. 95). Bituminous coal, from Pruden mine, a drift mine 1 mile east of Pruden on the Clearfork branch of the Southern Ry. Coal bed, Mingo; Carboniferous age, Mingo formation. Roof, sandy shale and shale; floor, clay. The bed was sampled April 6, 1915, by F. R. Clark, as described below:

Sections of coal bed in Pruden mine.

Section	A	B	C	D
Laboratory No.	21844	21845	21846	21847
Roof, shale and sandy shale.				
Coal, bright, usually laminated	2 0	.. ..	2 1	1 9
Coal	.. ..	1	.. ..	.. ..
Coal, "rashy"	2	.. ..	.. ..	.. ..
"Rash"	.. ..	a ½	a 2	.. ..
Coal, laminated and impure	.. ..	1 10	.. ..	.. ..
Coal, bright and soft	.. ..	.. ..	4	.. ..
Clay or shale *b*	a ½	.. ..	a 1½	a 3
Coal, dull and bony	2	.. ..	.. ..	.. ..
"Rash"	.. ..	a 2	.. ..	.. ..
Clay and "rash" interbedded	.. ..	a 6	.. ..	.. ..
Bone and lenses of impure coal, interbedded	.. ..	.. ..	.. ..	a 3
"Rash"	.. ..	a 4	.. ..	.. ..
Coal, bright, containing thin films of "sulphur" *c*	2 4	1 10	.. ..	2 2
Clay	a 1	.. ..	.. ..	.. ..
"Rash"	.. ..	a 4	.. ..	a ½
Coal, bright	5	2½	3	2
Shale or clay *d*	.. ..	a 1	a 5	a 10
Coal	.. ..	2	.. ..	.. ..
Shale	.. ..	a 6	.. ..	.. ..
Coal, massive and hard	.. ..	3 1	3 0	2 11
Floor, clay.				
Thickness of bed	5 2½	9 2	6 4½	8 6½
Thickness of coal sampled	5 1	7 2½	5 8	7 0

a Not included in sample.
b Sample 21847 contained bands of bone.
c Sample 21847 contained dull bands of bony coal.
d Sample 21846 contained sulphur balls.

Section A (sample 21844) was measured at face of 4 room, 7 left entry, 3 main entry, 1,900 feet east of mine mouth. Section B (sample 21845) was measured

at face of 9 room, 17 left entry, 1 main entry, 2,100 feet south of mine mouth. Section C (sample 21846) was measured at face of 17 right entry, 1 main entry, 3,000 feet south of mine mouth. Section D (sample 21847) was measured at face of 16 room, 5 right entry, 3 main entry, 1,300 feet south-southeast of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 21844, 21845, 21846, and 21847 is given under laboratory No. 21848.

FENTRESS COUNTY.

DAVIDSON. DAVIDSON MINE.

Analyses 20987, 20988, and 20989 (pp. 95–96). Bituminous coal, from Davidson mine, a drift mine five-eighths mile north of Davidson, and $1\frac{5}{8}$ miles north of Highland Junction on the Crawford branch of the Tennessee Central R. R. Coal bed, Bon Air No. 2; Carboniferous age, Lee formation. Average thickness, 4 to 5 feet. The bed was sampled by F. R. Clark on February 9, 1915, as described below:

Sections of coal bed in Davidson mine.

Section	A	B
Laboratory No.	20987	20988
Roof, sandstone and sandy shale.		
Coal, with bands of shale	[a] 1	[a] 1
"Sulphur" kidneys	[a] 1½	-- --
Coal	6½	10
Coal, soft, with "sulphur" balls	-- --	3
Coal, containing thin lenses of "sulphur"	7	-- --
"Sulphur" kidneys	-- --	[a] 1½
Coal	-- --	4
"Sulphur" kidneys	[a] 1	½
Coal	2 11½	2 6
Floor, sandstone and shale.		
Thickness of bed	4 4½	4 2
Thickness of coal sampled	4 1	3 11½

[a] Not included in sample.

Section A (sample 20987) was measured at face of main entry, 200 feet northeast of opening, and represented damp coal. Section B (sample 20988) was measured at face of main cross entry, 1,000 feet north-northeast of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 20987 and 20988 is given under laboratory No. 20989.

DAVIDSON. HIGHLAND NO. 2 MINE.

Analyses 20982 to 20985 and 20986 (p. 96). Bituminous coal, from Highland No. 2 mine, a drift mine one-half mile north of Davidson, and $1\frac{1}{2}$ miles north of Highland Junction on the Crawford branch of the Tennessee Central R. R. Coal bed, Bon Air No. 2; Carboniferous (Pottsville) age, Lee formation. Average thickness, 4 feet to 4 feet 8 inches. The bed was sampled February 8 and 9, 1915, by F. R. Clark, as described below:

Sections of coal bed in Highland No. 2 mine.

Section	A	B	C	D
Laboratory No.	20982	20983	20984	20986
Roof, sandstone and shale.				
Coal	1 0	9	10	5½
Coal, containing "sulphur" balls	-- --	-- --	6	-- --
"Sulphur"	a ½	-- --	-- --	-- --
Bone	-- --	[a] 2½	-- --	[a] 1
Coal	-- --	-- --	-- --	4
"Sulphur"	-- --	-- --	-- --	[a] 2½
Coal	3 2	2 8	3 ½	3 ½
Clay	-- --	-- --	[a] 1	-- --
Floor, sandstone.				
Thickness of bed	4 2½	3 7½	4 5½	4 1½
Thickness of coal sampled	4 2	3 5	4 4½	3 10

[a] Not included in sample.

Section A (sample 20982) was measured at face of main entry, 1,350 feet N. 41° E. of mine mouth. Section B (sample 20983) was measured at face of 2 right entry, 900 feet northeast of mine mouth. Section C (sample 20984) was measured at face of 3 right entry, 1,300 feet east of mine mouth. Section D (sample 20986) was measured 50 feet north of mouth of 2 left entry, 1,000 feet N. 41° E. of mine mouth. The coal had been exposed for a considerable time and may have been slightly weathered. The sample was wet.

The ultimate analysis of a composite sample made by mixing face samples 20982, 20983, and 20984 is given under laboratory No. 20985.

Wilder. Wilder No. 3 Mine.

Analyses 24845 to 24850 (p. 96). Bituminous coal, from Wilder No. 3 mine, a drift mine one-half mile northeast of Wilder, on the Tennessee Central R. R. Coal bed, Bon Air No. 2; Carboniferous (Pottsville) age, Lee formation. Thickness, 4½ to 5 feet. Roof, blue slate 20 to 30 feet thick; floor, hard smooth clay. Dip, 1½° NE. Cover at points of sampling, 150 feet. The bed was sampled by E. B. Sutton on April 8, 1916, as described below:

Sections of coal bed in Wilder No. 3 mine.

Section	A	B	C	D	E
Laboratory No.	24845	24846	24847	24848	24849
Roof, shale.					
Coal, with bands of "sulphur"	Ft. 4 in. 7½	Ft. in. 6	Ft. 4 in. 9½	Ft. 2 in. 3½	Ft. 4 in. 6½
"Sulphur"	.. ..	[a] 1¾	.. ..	[a] 1½	.. ..
Coal	.. ..	3 8¼	.. ..	2 2½	.. ..
Floor, clay.					
Thickness of bed	4 7½	4 4	4 9½	4 7½	4 6½
Thickness of coal sampled	4 7½	4 2¼	4 9½	4 6	4 6½

[a] Not included in sample.

Section A (sample 24845) was cut from face of 19 right entry. Section B (sample 24846) was cut from face of 5 room, 3 left entry, cross heading. Section C (sample 24847) was cut from face of 27 room, 20 right entry. Section D (sample 24848) was cut from face of 14 left heading. Section E (sample 24849) was cut from face of 43 room, 7 left entry.

The ultimate analysis of a composite sample made by combining face samples 24845, 24846, 24847, 24848, and 24849, is given under laboratory No. 24850.

The coal is mined by the room-and-pillar system. In 1916 it was partly cut by machine, and partly shot off the solid, black powder being used. The average daily output was about 550 tons, which was to be increased to 1,000 tons. About 80 per cent of the coal came from advance work. Screens were used, and the coal was picked over on car and on belt. There were 4 loading tracks with capacity for 60 empty and 60 loaded railroad cars. There was about 9,000 acres to be mined. The lifetime of the mine was estimated to be about 100 years.

GRUNDY COUNTY.

Coalmont. Coalmont E and I Mines.

Analyses 22383 and 22384 (p. 96). Bituminous coal, from Coalmont E and I mines, drift mines one-half mile N. 15° W. of Coalmont, at the terminus of the Tracy City branch of the Nashville, Chattanooga & St. Louis Ry. Coal bed, Sewanee; Carboniferous age, "Walden sandstone." Roof, shale; floor, shale and clay. The bed was sampled May 21, 1915, by F. R. Clark. Sample 22383 was collected at face of 11 room, 2 left entry, 1,140 feet N. 37° W. and 500 feet S. 55° W. of the mouth of Coalmont I mine, and represented 3 feet of laminated and contorted coal containing thin bands of mineral

charcoal, entire thickness of bed. The sample was damp. Sample 22384 was collected at face of main entry, 500 feet east of mouth of Coalmont E mine, and represented 4 feet 2½ inches of laminated and badly contorted coal, entire thickness of bed. The sample was damp.

Coalmont. Coalmont New A and Old A Mines.

Analyses 22385, 22386, and 22387 (pp. 96–97). Bituminous coal, from Coalmont New A and Old A mines, drift mines. The New A mine is one-fourth mile and Old A one-half mile southeast of Coalmont, the terminus of the Tracy City branch of the Nashville, Chattanooga & St. Louis Ry. Coal bed, Sewanee; Carboniferous age, "Walden sandstone." Roof and floor, shale. The bed was sampled May 21, 1915, by F. R. Clark.

Sample 22385 was measured in room neck, main entry, 600 feet northeast of the mouth of the Coalmont New A mine, and represented 2 feet 7 inches of laminated glossy coal, entire thickness of bed. Sample 22386 was measured in room neck, west main entry, 300 feet east of the mouth of Coalmont Old A mine, and represented 2 feet 3 inches of soft, laminated coal. One inch of rash above the coal was not included in the sample.

The ultimate analysis of a composite sample made by mixing samples 22383, 22384, 22385, and 22386, is given under laboratory No. 22387.

Coalmont. Coalmont S New Hill and S Old Hill Mines.

Analyses 22374 and 22375 (p. 97). Bituminous coal, from Coalmont S New Hill and S Old Hill drift mines, 2½ miles south-southeast and 2½ miles southeast of Coalmont, the terminus of the Tracy City branch of the Nashville, Chattanooga & St. Louis Ry. Coal bed, Sewanee; Carboniferous age, "Walden sandstone." Roof, shale; floor, shale and sandy shale. The bed was sampled May 21, 1915, by F. R. Clark.

Sample 22374 was measured at face of main entry, 2,380 feet S. 56° W. of the mouth of the Coalmont S Old Hill mine, and represented 4 feet 11 inches of laminated coal, entire thickness of bed.

Sample 22375 was measured at the face of 1 right entry, main entry, 1,063 feet S. 75° W. of the mouth of the Coalmont S New Hill mine and represented 3 feet of laminated coal. The section included 6 inches of carbonaceous shale, which was excluded from the sample.

Coalmont. Flanagan Mine.

Analysis 22373 (p. 97). Bituminous coal, from Flanagan mine, a drift mine 2 miles southeast of Coalmont, at the terminus of the Tracy City branch of the Nashville, Chattanooga & St. Louis Ry. Coal bed, Sewanee; Carboniferous age, "Walden sandstone." Roof and floor, shale. The bed was sampled May 21, 1915, by F. R. Clark. The sample was taken at face of main entry, 700 feet east and 300 feet south of mine mouth, and represented 2¾ feet of laminated and badly crushed coal, entire thickness of bed.

Coalmont. Mill Creek Prospects.

Analyses 22379, 22380, 22381, and 22382 (p. 97). Bituminous coal, from Mill Creek prospects, small drifts on Mill Creek, 11½ miles N. 40° E. of Coalmont, at the terminus of the Tracy City branch of the Nashville, Chattanooga & St. Louis Ry. Coal bed, Sewanee; Carboniferous age, "Walden sandstone." Roof, shale and sandstone; floor, shale and clay. The bed was sampled in each of three prospects on May 22, 1915, by F. R. Clark.

Sample 22379 was measured at the face of the drift entry, 60 feet east of mouth of prospect, near bottom of main branch of Mill Creek, and represented 4 feet of massive, hard coal, which was damp.

Sample 22380 was measured at the face of the drift entry, 50 feet south of the mouth of the prospect, on the west side of Mill Creek, and represented 3 feet 7 inches of massive, bright, hard coal. Sample was wet and weathered.

Sample 22381 was measured at the face of the drift entry, 100 feet east of mouth of prospect, on east side of Mill Creek, and represented 4 feet 2 inches of massive, bright, hard, coal, entire thickness of bed. Sample was weathered.

The ultimate analysis of a composite sample, made by mixing face samples 22379, 22380, and 22381 is given under laboratory No. 22382.

Tracy City. East Fork Mine.

Analysis 22361 (p. 97). Bituminous coal, from East Fork mine, a drift mine 1¼ miles northeast of Tracy City, on the Sparta branch of the Nashville, Chattanooga & St. Louis Ry. Coal bed, Sewanee; Carboniferous age, "Walden sandstone." Roof and floor, shale. The sample was cut May 19, 1915, by F. R. Clark in a room off 2 right entry, 1 main entry, 1,600 feet S. 16° W. of mine mouth, and represented 2 feet 10 inches of soft crushed and contorted coal. There was 2 inches of "rash" above the coal.

See analysis 22364 of composite sample under East Staub mine.

Tracy City. East Staub Mine.

Analyses 22363 and 22364 (p. 97). Bituminous coal, from East Staub mine, a drift mine 1¼ miles north-northeast of Tracy City, on the Sparta branch of the Nashville, Chattanooga & St. Louis Ry. Coal bed, Sewanee; Carboniferous age, "Walden sandstone." Roof and floor, shale. Sample 22363 was cut May 19, 1915, by F. R. Clark near 1 right entry, Campbell entry, 4,600 feet N. 20° E. of mine mouth, and represented 4 feet 4 inches of hard coal. There was 1 inch of soft clay above the coal.

The ultimate analysis of a composite sample, made by mixing samples 22359 (Reed Hill No. 1 mine), 22360 (Reed Hill No. 2 mine), 22361 (East Fork mine), 22362 (Rattlesnake mine), and 22363 is shown under laboratory No. 22364.

Tracy City. Old Clouse Hill Mine.

Analysis 22372 (p. 97). Bituminous coal, from Old Clouse Hill mine, a drift mine 3½ miles west of Tracy City on the Tracy City branch of the Nashville, Chattanooga & St. Louis Ry. Coal bed, Sewanee; Carboniferous age, "Walden sandstone." Roof, shale; floor, shale and clay. The bed was sampled May 20, 1915, by F. R. Clark.

Section of coal bed in Old Clouse Hill mine.

	Ft.	in.
Roof, shale.		
Coal		[a] ½
Shale, carbonaceous		[a] 2
Clay		[a] 3
Coal, bedded and contorted	3	4
Floor, clay.		
Thickness of bed	3	9½
Thickness of coal sampled	3	4

[a] Not included in sample.

The section was measured in a room 200 feet east of the mouth of a new opening at southwest point of Clouse Hill.

Tracy City. Old Ramsey Mine.

Analysis 22404 (p. 97). Bituminous coal, from Old Ramsey mine, a drift mine 2½ miles north-northwest of Tracy City on the Sparta branch of the Nashville, Chattanooga & St. Louis Ry. Coal bed, Sewanee; Carboniferous age, "Walden sandstone." Roof and floor, shale. The sample was cut May 20, 1915, by F. R. Clark near 11 right

entry, old T. C. I. main entry, 2,600 feet N. 45° E. of mouth near Old Ramsey tipple and represented 4 feet 8 inches of coal that was glossy and banded. The section included 2 inches of rash, which was excluded from the sample.

The ultimate analysis of a composite sample made by mixing sample 22404 and sample 22403 (from West Ramsey mine) is shown under laboratory No. 22405.

Tracy City. Old Staub Mine.

Analysis 22371 (p. 97). Bituminous coal, from Old Staub mine, a drift mine 1 mile east of Tracy City on the Sparta branch of the Nashville, Chattanooga & St. Louis Ry. Coal bed, Sewanee; Carboniferous age, "Walden sandstone." Roof and floor, shale. The sample was cut May 20, 1915, by F. R. Clark at face of Jerry Downing entry, old main entry of No. 1 mine, 5,850 feet N. 20° W. of mouth of old No. 1 mine, and represented 3 feet 8 inches of coal, which was banded and badly contorted. There was 2 inches of clay above the coal.

Tracy City. Rattlesnake Mine.

Analysis 22362 (p. 97). Bituminous coal, from Rattlesnake mine, a drift mine 1¾ miles northeast of Tracy City on the Sparta branch of the Nashville, Chattanooga & St. Louis Ry. Coal bed, Sewanee; Carboniferous age, "Walden sandstone." Roof and floor, shale. The sample was cut May 19, 1915, by F. R. Clark at the face of crosscut, old Rattlesnake entry, 2,100 feet N. 10° W. of mine mouth, and represented 2 feet 10 inches of coal. There was 1 inch of soft clay above the coal.

See analysis 22364 of composite sample under East Staub mine.

Tracy City. Reed Hill No. 1 Mine.

Analysis 22359 (p. 97). Bituminous coal, from Reed Hill No. 1 mine, a drift mine 1½ miles east of Tracy City on the Tracy City branch of the Nashville, Chattanooga & St. Louis Ry. Coal bed, Sewanee; Carboniferous age, "Walden sandstone." Roof and floor, shale. The sample was cut May 19, 1915, by F. R. Clark at face of a room off main entry, 2,400 feet south of mine mouth, and represented 2 feet 8½ inches of hard, glossy coal. There was 4 inches of "rash" below the coal.

See analysis 22364 of composite sample under East Staub mine.

Tracy City. Reed Hill No. 2 (Henley) Mine.

Analysis 22360 (p. 97). Bituminous coal, from Reed Hill No. 2 (Henley) mine, a drift mine 2 miles east of Tracy City on the Sparta branch of the Nashville, Chattanooga & St. Louis Ry. Coal bed, Sewanee; Carboniferous age, "Walden sandstone." Roof and floor, shale. The bed was sampled on May 19, 1915, by F. R. Clark. The section was measured at the face of Sitz entry near the face of old No. 7 in Old Reed Hill mine, 1,300 feet N. 75° W. of the mine mouth, and represented 3 feet 8 inches of hard, massive coal, which was damp when sampled. The upper 3 inches of coal, containing bands of "sulphur," was excluded from the sample. The bed is 3 feet 11 inches thick.

See analysis 22364 of composite sample under East Staub mine.

Tracy City. West Ramsey Mine.

Analyses 22403 and 22405 (p. 97). Bituminous coal, from West Ramsey mine, a drift mine 2½ miles west of Tracy City on the Sparta branch of the Nashville, Chattanooga & St. Louis Ry. Coal bed, Sewanee; Carboniferous age, "Walden sandstone." Roof and floor, shale. The sample was cut May 20, 1915, by F. R. Clark near face of Saunders entry, Old N. C. main entry, 1,850 feet S. 60° W. of mine mouth near old Ramsey tipple, and represented 3 feet 8 inches of coal which was badly contorted. One inch of clay above the coal.

The ultimate analysis of a composite sample made by mixing samples 22403 and 22404 is given under laboratory No. 22405.

HAMILTON COUNTY.

DAISY. ABEL MINE.

Analysis 22249 (p. 98). Bituminous coal, from Abel mine, a small drift mine three-fourths mile northwest of Daisy on the Cincinnati, New Orleans & Texas Pacific Ry. Coal bed, not identified; Carboniferous age, Lookout sandstone(?). Roof, sandy shale; floor, clay. The sample was cut May 6, 1915, by F. R. Clark at the face of 2 room, main entry, 350 feet north-northeast of mine mouth, and represented 1 foot 4 inches of hard steel-gray coal, which was wet when sampled. Above the coal was 6 inches of shale containing lenses of "sulphur," which was excluded from the sample.

MONTLAKE. MONTLAKE MINE.

Analyses 22243 to 22246 (p. 98). Bituminous coal, from Montlake mine, a drift mine 2½ miles northwest of Montlake on the Cincinnati, New Orleans & Texas Pacific Ry. Coal bed, No. 10; Carboniferous age, "Walden sandstone." The bed was sampled May 6, 1915, by F. R. Clark.

Sections of coal bed in Montlake mine.

Section	A		B		C	
Laboratory No.	22243		22244		22245	
Roof, sandy shale.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Shale and bands of bone	..	..	..	..		[a] 3
Coal, bony	..	..		[a] 2	..	..
Coal, bright and laminated	..	..	..	..		4
Coal, massive, bright, and hard	2	5	3	2	2	9
Floor, shale.						
Thickness of bed	2	5	3	4	3	4
Thickness of coal sampled	2	5	3	2	3	1

[a] Not included in sample.

Section A (sample 22243) was measured at face of 3 cross entry, 1,400 feet N. 30° E. of mine mouth. The coal was wet when sampled. Section B (sample 22244) was measured at face of 11 cross entry, 2,850 feet N. 32° E. of mine mouth. The coal was wet when sampled. Section C (sample 22245) was measured at face of 11 right cross entry, 2,700 feet N. 20° E. of mine mouth.

The results of an ultimate analysis of a composite sample made by mixing face samples 22243, 22244, and 22245 is given under laboratory No. 22246.

DAISY. MONTLAKE NO. 4 MINE.

Analysis 22247 (p. 98). Bituminous coal, from Montlake No. 4 mine, 2⅜ miles northwest of Montlake station on the Cincinnati, New Orleans & Texas Pacific Ry. Coal bed, not identified; Carboniferous age, "Walden sandstone." Roof, sandy shale; floor, clay. The sample was cut May 6, 1915, by F. R. Clark at the face of 1 right entry, 185 feet N. 4° E. and 415 feet S. 86° E. of the mine mouth, and represented 2 feet 10 inches of soft, badly crushed coal, which was damp, when sampled, entire thickness of bed.

RATHBURN. BIG SODDY MINE.

Analysis 22248 (p. 98). Bituminous coal, from Big Soddy mine, a drift mine 2¼ miles northwest of Rathburn on the Cincinnati, New Orleans & Texas Pacific Ry. Coal bed, Soddy; Carboniferous age, "Walden sandstone." Roof, sandy shale; floor, shale. The sample was cut May 5, 1915, by F. R. Clark in 8 room, main entry, 1,200 feet N. 25° E. of mine mouth, and represented 3 feet 8 inches of laminated soft coal. There was 2 inches of "rash" above the coal sampled. The rib had been exposed for a considerable time, and the coal may have been slightly weathered.

Rathburn. Furman Mine.

Analyses 22211 to 22213 (p. 98). Bituminous coal from Furman mine, a drift mine three-fourths mile west of Rathburn on the Cincinnati, New Orleans & Texas Pacific Ry. Coal bed, Soddy; Carboniferous age, "Walden sandstone" (?). The bed was sampled May 4, 1915, by F. R. Clark, as described below:

Sections of coal bed in Furman mine.

Section	A	B
Laboratory No.	22211	22212
Roof, sandy shale.		
"Rash" and clay	*a* 2	*a* 1
Coal, laminated *b*	1 11	2
Coal, steel gray and hard	.. ..	1 3
Coal, "rashy"	2	.. ..
Floor, shale and sandstone.		
Thickness of bed	2 3	1 6
Thickness of coal sampled	2 1	1 5

a Not included in sample. *b* 22211 contained thin bands of mineral charcoal.

Section A (sample 22211) was measured at face of Jones place, 650 feet N. 15° W. of mine mouth. Section B (sample 22212) was measured at face of 4 room, 1 right entry, 700 feet N. 10° W. of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 22211 and 22212 is given under laboratory No. 22213.

Rathburn. Old Bunker Mine.

Analysis 22190 (p. 98). Bituminous coal, from Old Bunker mine, a drift mine 1¼ miles southwest of Rathburn, on the Cincinnati, New Orleans & Texas Pacific Ry. Coal bed, Soddy; Carboniferous age, "Walden Sandstone" (?). The bed was sampled May 4, 1915, by F. R. Clark, as described below:

Section of coal bed in Old Bunker mine.

	Ft.	in.
Roof, shale and sandstone.		
Coal, lustrous and soft		7
Coal, steel gray and hard	1	11
Coal, laminated		3
Floor, clay.		
Thickness of bed	2	9
Thickness of coal sampled	2	9

The section was measured at the face of 5 room, main entry, 500 feet N. 80° W. of mine mouth and represented weathered coal.

Rathburn. Sheephead Mine.

Analyses 22187 to 22189 (pp. 98–99). Bituminous coal from Sheephead mine, a slope mine 1½ miles southwest of Rathburn on the Cincinnati, New Orleans & Texas Pacific Ry. Coal bed, Soddy; Carboniferous age, "Walden sandstone" (?). The bed was sampled May 4, 1915, by F. R. Clark, as described below:

Sections of coal bed in Sheephead mine.

Section	A		B	
Laboratory No.	22187		22188	
Roof, sandy shale.	*Ft.*	*in.*	*Ft.*	*in.*
Coal, steel gray and hard	2	0	1	5½
Coal, lustrous and hard	..	..		5
Coal, laminated		4		11
Floor shale.				
Thickness of bed	2	4	2	9½
Thickness of coal sampled	2	4	2	9½

Section A (sample 22187) was measured at face of 3 room, new slope, 400 feet N. 10° W. of mine mouth. Section B (sample 22188) was measured at face of 6 room, back entry, 350 feet S. 40° W. of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 22187 and 22188 is given under laboratory No. 22189.

Rathburn. Soddy No. 1 Mine.

Analyses 22160 to 22164 (p. 99). Bituminous coal, from Soddy No. 1 mine, a drift mine 1¼ miles west of Rathburn on the Cincinnati, New Orleans & Texas Pacific Ry. Coal bed, Soddy; Carboniferous age, "Walden sandstone" (?). The bed was sampled May 3, 1915, by F. R. Clark, as described below:

Section of coal bed in Soddy No. 1 mine.

Section	A	B	C	D
Laboratory No.	22160	22161	22162	22163
Roof, sandy shale and sandstone.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
"Rash"	[a] ½	.. ..	.. ..	.. ..
Bone	.. ..	.. ..	.. ..	[a] 1
Coal, steel gray and hard	2 8	2 0	2 0	2 4
Coal, laminated and brittle	.. ..	3	4	.. ..
Rash [b]	[a] 1	.. ..	.. ..	[a] 8
Bone	.. ..	[a] 2	.. ..	.. ..
Floor, shale or clay.				
Thickness of bed	2 9½	2 5	2 4	3 1
Thickness of coal sampled	2 8	2 3	2 4	2 4

[a] Not included in sample. [b] In sample 22163 rash and coal lenses were interbedded.

Section A (sample 22160) was measured at face of 43 room, 5 right entry, new haulage-way, 8,900 feet S. 75° W. of mine mouth. Section B (sample 22161) was measured at face of 3 room, 11 right entry, new haulage way, 9,300 feet S. 65° W. of mine mouth. Section C (sample 22162) was measured at face of 14 right entry, new main entry, 7,000 feet N. 85° W. of mine mouth. Section D (sample 22163) was measured at face of 1 room, 17 right entry, main entry, 8,200 feet west of mine mouth.

The ultimate analyses of a composite sample made by mixing face samples 22160, 22161, 22162, and 22163 is given under laboratory No. 22164.

MARION COUNTY.

Orme. Battle Creek Nos. 3, 4, and 5 Mines.

Analyses 22230 to 22234 (p. 99). Bituminous coal, from Battle Creek Nos. 3, 4, and 5 mines, drift mines 1½ miles north of, 1½ miles north of, and 2¾ miles northwest of Orme on a branch of the Nashville, Chattanooga & St. Louis Ry. Coal bed, Battle Creek; Carboniferous age, Lookout sandstone (?). The bed was sampled May 11, 1915, by F. R. Clark, as described below:

Sections of coal bed in Battle Creek Nos. 3, 4, and 5 mines.

Section	A	B	C	D
Laboratory No.	22230	22231	22232	22233
Roof, sandy shale and shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal, bright, hard, and massive	1 5	2 0	3 6	3 4
"Rash"	[a] 1½	[a] 2	[a] 4	[a] 2
Coal, lustrous and laminated	3 7½	1 8	2 4	2 2
"Rash"	.. ..	[a] 5	[a] 3 2	[a] 4
Coal, bright, crushed, and contorted	.. ..	1 1	.. ..	7
"Rash"	.. ..	.. ..	.. ..	[a] 3
Floor, shale and clay.				
Thickness of bed	5 2	5 4	9 4	6 10
Thickness of coal supplied	5 ½	4 9	5 10	6 1

[a] Not included in sample.

Section A (sample 22230) was measured on pillar, 5 right entry, 1,600 feet north and 750 feet east of mouth of Battle Creek No. 4 mine. Section B (sample 22231) was measured on pillar, Collins entry, 1,550 feet west of mouth of Battle Creek No. 3 mine. Section C (sample 22232) was measured in main entry, 60 feet east of mouth of Battle Creek No. 5 mine. The sample was taken from a prospect just being opened and the coal was probably slightly weathered. Section D (sample 22233) was measured on pillar, face of 16 left entry, 2,500 feet north and 1,500 feet west of mouth of Battle Creek No. 4 mine.

The ultimate analysis of a composite sample made by mixing samples 22230 to 22233 is shown under laboratory No. 22234.

Tracy City. Long Ridge Mine.

Analysis 22370 (p. 99). Bituminous coal, from Long Ridge mine, a drift mine 7 miles east of Tracy City on the Tracy City branch of the Nashville, Chattanooga & St. Louis Ry. Coal bed, Sewanee; Carboniferous age, "Walden sandstone." Roof, shale; floor, clay. The sample was cut May 18, 1915, by F. R. Clark at face of main entry, 250 feet S. 45° E. of mine mouth, and represented 3 feet 3 inches of hard, massive coal, entire thickness of bed. The coal was damp and slightly weathered.

Tracy City. Pryor Ridge No. 1 Mine.

Analyses 22398 to 22402 (p. 99). Bituminous coal, from Pryor Ridge No. 1 mine, a drift mine 5½ miles east of Tracy City on the Tracy City branch of the Nashville, Chattanooga & St. Louis Ry. Coal bed, Sewanee; Carboniferous age, "Walden sandstone." The bed was sampled on May 18, 1915, by F. R. Clark, as described below:

Sections of coal bed in Pryor Ridge No. 1 mine.

Section Laboratory No.	A 22398	B 22399	C 22400	D 22401
	Ft. in.	*Ft. in.*	*Ft. in.*	*Ft. in.*
Roof, shale.				
Clay, soft	.. ..	[a] ½	.. ..	.. ..
Coal, laminated	.. ..	.. ..	.. ..	3
"Mother coal"	.. ..	.. ..	.. ..	1
Coal, laminated	.. ..	8	.. ..	6
Coal, massive and hard	.. ..	4 0	3 11½	2 0
Coal, soft and glossy	3 6	.. ..	.. ..	.. ..
"Rash"	.. ..	.. ..	[a] ½	.. ..
Coal, laminated and soft	.. ..	.. ..	.. ..	1 0
Coal, massive and hard	.. ..	.. ..	.. ..	1 3
Floor, shale.				
Thickness of bed	3 6	4 8½	4 0	5 1
Thickness of coal sampled	3 6	4 8	3 11½	5 1

[a] Not included in sample.

Section A (sample 22398) was measured at face of 6 room, Thompson entry, left main entry, 1,200 feet N. 10° E. of mine mouth. Section B (sample 22399) was measured at face of 4 right entry, 5 right entry, left main entry, 2,700 feet east of mine mouth. Section C (sample 22400) was measured at face of 5 right entry, right main entry, 1,800 feet N. 45° W. of mine mouth. Section D (sample 22401) was measured on 20 stump, 5 left entry, right main entry, 1,900 feet S. 80° W. of mine mouth.

The ultimate analysis of a composite sample made by mixing samples 22398 to 22401 is shown under laboratory No. 22402.

Whiteside. Bessie Prospect.

Analysis 22258 (p. 99). Bituminous coal, from Bessie Prospect, a small drift 1 mile southwest of Whiteside on the Nashville, Chattanooga & St. Louis Ry. Coal bed, Old Etna; Carboniferous age, "Walden sandstone." Roof, sandy shale; floor, clay. The sample was cut on May 8, 1915, by F. R. Clark from rib, main entry, 400 feet south

of drift mouth, and represented 24½ inches of lustrous, hard coal entire thickness of bed. The coal was weathered.

WHITESIDE. CASTLE ROCK MINE.

Analyses 22254 to 22256 (pp. 99–100). Bituminous coal, from Castle Rock mine, a drift mine 1 mile west of Whiteside on the Nashville, Chattanooga & St. Louis Ry. Coal bed, Castle Rock; Carboniferous age, "Walden sandstone." The bed was sampled May 8, 1915, by F. R. Clark, as described below:

Sections of coal bed in Castle Rock mine.

Section	A	B
Laboratory No.	22254	22255
Roof, sandy shale.	*Ft. in.*	*Ft. in.*
Bone and "sulphur" lenses interbedded	[a] 1	.. ..
Coal, bright and hard	10½	.. ..
Coal, soft and laminated	7	2 0
"Rash"	[a] 1½	.. ..
Coal, lustrous and soft	2 1	.. ..
Coal, "rashy"	.. ..	4
"Rash"	.. ..	[a] 3
Floor, clay.		
Thickness of bed	3 9	2 7
Thickness of coal sampled	3 6½	2 4

[a] Not included in sample.

Section A (sample 22254) was measured at face of main entry, 200 feet south of mine mouth. The coal was wet when sampled. Section B (sample 22255) was measured at face of 1 right entry, 175 feet S. 20° W. of mine mouth. The coal was damp when sampled.

The ultimate analysis of a composite sample made by mixing face samples 22254 and 22255 is shown under laboratory No. 22256.

WHITESIDE. CLEMENTS PROSPECT.

Analysis 22257 (p. 100). Bituminous coal, from Clements prospect, a drift prospect 1 mile southwest of Whiteside on the Nashville, Chattanooga & St. Louis Ry. Coal bed, Castle Rock; Carboniferous age, "Walden sandstone." Roof, sandy shale; floor, clay. The sample was cut May 8, 1915, by F. R. Clark from rib of main entry, 100 feet southwest of drift mouth, and represented 3 feet 4 inches of massive, hard coal entire thickness of bed. The coal was damp and slightly weathered.

WHITESIDE. NEW ETNA NO. 1 AND NO. 2 MINES.

Analyses 22235 to 22238 (p. 100). Bituminous coal, from New Etna No. 1 and No. 2 mines, drift mines 7 miles northwest of Whiteside on the Nashville, Chattanooga & St. Louis Ry. Coal bed, Kelley; Carboniferous age, "Walden sandstone." The bed was sampled on May 10, 1915, by F. R. Clark, as described below:

Sections of coal bed in New Etna No. 1 and No. 2 mines.

Section	A	B	C
Laboratory No.	22235	22236	22237
Roof, shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal, lustrous and massive [a]	1 9	1 6	2 6
Coal, laminated	1 0	1 0	.. ..
Floor, shale.			
Thickness of bed	2 9	2 6	2 6
Thickness of coal sampled	2 9	2 6	2 6

[a] Sample 22235 contained coal of cubical structure.

Section A (sample 22235) was measured at face of 4 cross entry, 3,000 feet northwest of mouth of No. 1 mine. Section B (sample 22236) was measured at face of 7 cross entry, 2,000 feet northeast of mouth of No. 1 mine. Section C (sample 22237) was measured at face of 1 left entry, 1,000 feet southwest of mouth of No. 2 mine. The coal was damp when sampled.

The ultimate analysis of a composite sample made by mixing face samples 22235 to 22237 is given under laboratory No. 22238.

WHITESIDE. OLD ETNA NO. 1 AND NO. 2 MINES.

Analyses 22251 to 22253 (p. 100). Bituminous coal, from Old Etna No. 1 and No. 2 mines, drift mines 1⅛ miles west of Whiteside on the Nashville, Chattanooga & St. Louis Ry. Coal bed, Old Etna; Carboniferous age, "Walden sandstone." Roof, sandy shale; floor, fire clay. The bed was sampled May 8, 1915, by F. R. Clark.

Sample 22251 was collected at face of main entry, 165 feet west of mouth of No. 1 mine, and represented a 25-inch cut of hard, lustrous coal, entire thickness of bed. The coal was wet when sampled.

Sample 22252 was collected at the face of main entry, 200 feet south-southwest of mouth of No. 2 mine, and represented a 23-inch cut of hard, bright coal, entire thickness of bed. The coal was wet when sampled.

The ultimate analysis of a composite sample made by mixing face samples 22251 and 22252 is given under laboratory No. 22253.

WHITWELL. WHITWELL NO. 1 AND NO. 5 MINES.

Analyses 22267 to 22271 (pp. 100–101). Bituminous coal, from Whitwell No. 1 and No. 5 mines, drift mines 1 mile southwest and 1¾ miles northwest of Whitwell on the Pikeville branch of the Nashville, Chattanooga & St. Louis Ry. Coal bed, Sewanee; Carboniferous age, "Walden sandstone." Roof and floor, shale. The bed was sampled on May 15, 1915, by F. R. Clark.

Sample 22267 was cut at face of 23 south entry, 5,500 feet S. 21° W. of mouth of No. 1 mine, and represented 40½ inches of massive, hard coal, entire thickness of bed.

Sample 22268 was cut at face of 7 north entry, main haulageway, 1,150 feet N. 39° E. of the main haulageway south opening of No. 5 mine, and represented 41 inches of massive hard coal, entire thickness of bed.

Sample 22269 was cut at the face of the main slope entry, 500 feet north and 2,750 feet N. 21° E. of mouth of main haulageway, No. 5 mine, and represented 39 inches of hard bedded coal entire thickness of bed.

Sample 22270 was collected at the face of 4 north entry, main haulageway, 1,850 feet N. 39° E. of mouth of No. 5 mine, and represents 39 inches of massive, hard coal, entire thickness of bed.

The ultimate analysis of a composite sample made by mixing samples 22267, 22268, 22269, and 22270 is given under laboratory No. 22271.

MORGAN COUNTY.

BLUE GEM SIDING. BOTTOMLEE MINE.

Analysis 21150 (p. 101). Bituminous coal, from Bottomlee mine, a small drift mine 2 miles west-southwest of Blue Gem Siding on the Harriman & Northeastern R. R. Coal bed, Blue Gem; Carboniferous age, Briceville shale. Roof, sandy shale; floor, clay. The sample was cut by F. R. Clark on February 26, 1915, from face of 1 right entry, 650 feet west of mine mouth, and represented 2 feet of massive, hard coal, entire thickness of bed.

Blue Gem Siding. Coal Cut Mine.

Analysis 21145 (p. 101). Bituminous coal, from Coal Cut mine, a small drift mine at Blue Gem Siding on the Harriman & Northeastern R. R. Coal bed, Blue Gem; Carboniferous age, Briceville shale. Roof, shale or sandy shale; floor, clay. The bed was sampled by F. R. Clark on February 26, 1915, as described below:

Section of coal bed in Coal Cut mine.

	Ft.	in.
Roof, sandy shale.		
Coal, bright and hard		9½
"Rash" and clay		[a] ½
Coal, bright and hard		8½
"Rash" and clay		[a] 2
Floor, clay.		
Thickness of bed	1	8½
Thickness of coal sampled	1	6

[a] Not included in sample.

The sample was measured in the main entry, 250 feet east of mine mouth. The coal was slightly weathered.

Christmas Siding. Grassy Ridge Mine.

Analysis 21151 (p. 101). Bituminous coal, from Grassy Ridge mine, an abandoned drift mine 1½ miles west of Christmas Siding on the Harriman & Northeastern R. R. Coal bed, Grassy Ridge; Carboniferous age, "Walden sandstone." Average thickness, 2 feet 2 inches. Roof, sandy shale; floor, clay. The bed was sampled by F. R. Clark on February 27, 1915. The sample was cut on rib of main entry of new opening, 250 feet north of mine mouth, and represented 2 feet 1½ inches of hard, massive coal, entire thickness of bed. The coal was weathered.

Christmas Siding. Harriman Mine.

Analysis 21152 (p. 101). Bituminous coal, from Harriman mine, an abandoned slope mine one-half mile west of Christmas siding on the Harriman & Northeastern R. R. Coal bed, Hooper; Carboniferous age, formation not identified. Roof, sandy shale; floor, clay. The sample was cut by F. R. Clark on February 27, 1915, in rib of main slope, 50 feet south of mine mouth, and represented 3 feet 10 inches of hard, massive coal. The section, 4 feet 1 inch, included 3 inches of rash and coal interbedded, which was excluded from the sample. The coal was wet and weathered.

Christmas Siding. Smith Mine.

Analysis 21153 (p. 101). Bituminous coal, from Smith mine, a small drift mine one-fourth mile south of Christmas siding on the Harriman & Northeastern R. R. Coal bed, Hooper (?); Carboniferous age, formation not identified. The bed was sampled by F. R. Clark on February 27, 1915, as described below:

Section of coal bed in Smith mine.

	Ft.	in.
Roof, sandy shale.		
"Rash"		[a] 2
Coal, bright and hard		4
Coal, dull and hard		1½
Coal, bright, hard, and massive		11½
"Rash"		[a] 2
Floor, clay.		
Thickness of bed	1	9
Thickness of coal sampled	1	5

[a] Not included in sample.

The sample was cut from rib in main entry, 100 feet south of mine mouth, in wet, slightly weathered coal.

Coalfield. Bowing Mine.

Analyses 21104, 21105, and 21106 (p. 101). Bituminous coal, from Bowing mine, a drift mine 1½ miles northeast of Coalfield on the Harriman & Northeastern R. R. Coal bed, Coal Creek; Carboniferous age, Briceville shale. Average thickness, 4½ feet. The bed was sampled by F. R. Clark on February 22, 1915, as described below:

Sections of coal bed in Bowing mine.

Section	A	B
Laboratory No.	21104	21105
Roof, shale.	Ft. in.	Ft. in.
Coal, containing "sulphur" kidneys	.. ..	8½
Coal, "rashy"	.. ..	1
Coal, bright and hard	1 2	.. ..
Coal, containing "sulphur" lenses	10	2 ½
Clay, containing thin bands of coal	a 3	a 5
Clay	a 4	.. ..
Coal, bright and soft	1 8	11
Coal (reported)	.. ..	a 1 0
Floor, sandy shale.		
Thickness of bed	4 3	5 2
Thickness of coal sampled	3 8	3 9

a Not included in sample.

Section A (sample 21104) was measured in 6 left entry, 1 entry, 2,400 feet N. 30° W. of mine mouth. Section B (sample 21105) was measured in main Fisher entry, 600 feet northeast of mine mouth. The coal in sample 21105 was taken from the rib where it had been exposed to the mine air for a considerable time, and was damp and probably slightly weathered.

The ultimate analysis of a composite sample made by mixing samples 21104 and 21105 is given under laboratory No. 21106.

Coalfield. Conger (Old Baker) Mine.

Analyses 21100 to 21103 (p. 101). Bituminous coal from Conger (Old Baker) mine, a drift mine 1½ miles northeast of Coalfield on the Harriman & Northeastern R. R. Coal bed, Coal Creek; Carboniferous age, Briceville shale. Average thickness, 3 feet 10 inches. The bed was sampled by F. R. Clark on February 23, 1915, as described below:

Sections of coal bed in Conger (Old Baker) mine.

Section	A	B	C
Laboratory No.	21100	21101	21102
Roof, sandy shale.	Ft. in.	Ft. in.	Ft. in.
Shale, containing thin lenses of coal	.. ..	a 2	a 2
Coal, bright and soft	.. ..	.. ..	11
Coal, massive and hard, locally laminated	3 10	2 4	7
Coal, soft	.. ..	6	.. ..
"Sulphur"	.. ..	a ½	a 1
Coal, hard, massive	.. ..	8½	.. ..
Coal, containing thin lenses of "sulphur"	.. ..	.. ..	1 10
Coal and "sulphur" lenses interbedded	a 5	a 2	a 2
Floor, clay.			
Thickness of bed	4 3	3 11	3 9
Thickness of coal sampled	3 10	3 6½	3 4

a Not included in sample.

Section A (sample 21100) was measured at face of 2 right entry, 1,800 feet northeast of mine mouth. The coal was damp when sampled. Section B (sample 21101) was measured at face of 6 right entry, 2,000 feet northeast of mine mouth. Section C (sample 21102) was measured at face of 8 right entry, 2,000 feet northeast of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 21100, 21101, and 21102 is given under laboratory No. 21103.

COALFIELD. DAVIS MINE.

Analysis 21147 (p. 101). Bituminous coal, from Davis mine, a small local drift mine three-fourths mile west of Coalfield on the Harriman & Northeastern R. R. Coal bed, Coal Creek (?); Carboniferous age, Briceville shale (?). The bed was sampled by F. R. Clark on February 25, 1915, as described below:

Section of coal bed in Davis mine.

	Ft.	in.
Roof, sandy shale.		
Coal, hard and bright	1	7
Clay, with thin bands of "rash" interbedded	[a] 1	2
Coal		11
Clay		[a] 11
Coal		10
Floor, clay.		
Thickness of bed	5	5
Thickness of coal sampled	3	4

[a] Not included in sample.

The sample was cut in 1 right entry, 200 feet from the main entry. The coal was damp and weathered.

COALFIELD. SLOPE MINE.

Analysis 21099 (p. 101). Bituminous coal, from Slope mine, 1½ miles northeast of Coalfield on the Harriman & Northeastern R. R. Coal bed, Coal Creek; Carboniferous age, Briceville shale. Average thickness, 4 feet 6 inches to 4 feet 10 inches. The bed was sampled by F. R. Clark on February 22, 1915, as described below:

Section of coal bed in Slope mine.

	Ft.	in.
Roof, shale.		
Coal, bright and laminated		9½
Coal, bright and hard	1	1
Coal, bright and massive	1	5½
"Rash"		½
Coal, massive	1	2½
Coal (reported)		[a] 4
Floor, shale.		
Thickness of bed	4	10¾
Thickness of coal sampled	4	6¾

[a] Not included in sample.

The sample was cut in mouth of 1 east entry, 250 feet northeast of the mine mouth. The sample was wet.

COALFIELD. THORNTON MINE.

Analysis 21146 (p. 101). Bituminous coal, from Thornton mine, a small drift mine 1¼ miles southeast of Coalfield on the Harriman & Northeastern R. R. Coal bed, Blue Gem; Carboniferous age, Briceville shale. Average thickness, 3 feet. Roof, shale; floor, clay. The bed was sampled by F. R. Clark on February 26, 1915, as described below:

Section of coal bed in Thornton mine.

	Ft.	in.
Roof, shale.		
Coal, blocky		9
Clay		[a] 2
Coal, finely crushed and mixed with clay		[a] 4
Coal, bright and massive	2	3
Floor, clay.		
Thickness of bed	3	6
Thickness of coal sampled	3	0

[a] Not included in sample.

The sample was cut at the face of 1 left entry, 100 feet north and 50 feet west of mine mouth. The coal was weathered and the sample was wet.

LANCING. SUMMERS MINE.

Analysis 21148 (p. 101). Bituminous coal, from Summers mine, a small drift mine 8 miles east of Lancing on the Cincinnati, New Orleans & Texas Pacific Ry. Coal bed, not named; Carboniferous age, Wartburg sandstone. Roof, sandstone; floor, clay. The bed was sampled by F. R. Clark on February 25, 1915, as described below:

Section of coal bed in Summers mine.

	Ft.	in.
Roof, sandstone.		
Coal, bright and blocky		10
"Rash" and clay interbedded		[a] 4
Coal, massive and blocky	2	2
Floor, clay.		
Thickness of bed	3	4
Thickness of coal sampled	3	0

[a] Not included in sample.

The sample was cut at face of main entry, 230 feet S. 30° E. of mine mouth. The coal was weathered and the sample was wet.

NEMO. CATOOSA MINE.

Analysis 21428 (p. 101). Bituminous coal, from Catoosa mine, a small drift mine 3½ miles southwest of Nemo on the Cincinnati, New Orleans & Texas Pacific R. R. Coal bed, Walden Ridge; Carboniferous age, Lee (?) formation. Average thickness, 3 feet 6 inches. The bed was sampled by F. R. Clark on March 8, 1915, as described below:

Section of coal bed in Catoosa mine.

	Ft.	in.
Roof, sandy shale.		
Coal		[a] 1
"Rash," black shale, and lenses of coal		[a] 5
Coal, soft and more or less crushed	2	2
Floor, clay.		
Thickness of bed	2	8
Thickness of coal sampled	2	2

[a] Not included in sample.

The sample was cut at face of 2 room, 1 right entry, 75 feet north of mine mouth. The coal was mined only for use in the company's engines.

OLIVER SPRINGS. BIG MOUNTAIN MINE.

Analysis 21424 (p. 102). Bituminous coal, from Big Mountain mine, an abandoned drift mine 3¾ miles north-northwest of Oliver Springs on the Southern and the Louisville & Nashville Railroads. Coal bed, Coal Creek; Carboniferous age, Briceville shale. The bed was sampled by F. R. Clark on March 10, 1915, as described below:

Section of coal bed in Big Mountain mine.

	Ft.	in.
Roof, shale.		
"Rash" and coal interbedded		[a] 1
Coal, massive and blocky		6
Clay		[a] 3
Coal, massive and blocky	2	7
Coal (under water)		[a] 4
Floor, clay.		
Thickness of bed	3	9
Thickness of coal sampled	3	1

[a] Not included in sample.

The sample was cut on rib in main entry, 300 feet north of mine mouth. The coal was slightly weathered.

OLIVER SPRINGS. JACKSON MINE.

Analysis 21426 (p. 102). Bituminous coal, from Jackson mine, a small drift mine 1¾ miles northwest of Oliver Springs on the Southern and the Louisville & Nashville Railroads. Coal bed, Coal Creek (?); Carboniferous age, Briceville shale (?). The bed was sampled by F. R. Clark on March 9, 1915, as described below:

Section of coal bed in Jackson mine.

	Ft.	in.
Roof, shale.		
Coal and some "rash"		[a] 2½
Coal, massive, hard, and flinty	2	0
Coal, soft and crushed		10
Floor, clay.		
Thickness of bed	3	½
Thickness of coal sampled	2	10

[a] Not included in sample.

The sample was cut from rib, main entry, 400 feet northwest of mine mouth. The coal was slightly weathered.

OLIVER SPRINGS. LEVAN MINE.

Analysis 21420 (p. 102). Bituminous coal, from Levan (wagon) mine, a drift mine 1½ miles west-northwest of Oliver Springs on the Southern and the Louisville & Nashville Railroads. Coal bed, Old Eagle; Carboniferous age, Briceville shale. Average thickness, 3 feet. The bed was sampled by F. R. Clark on March 10, 1915, as described below:

Section of coal bed in Levan mine.

	Ft.	in.
Roof, shale.		
Coal and "rash" interbedded		[a] 5
Coal, hard, massive, and blocky	1	10
Coal and "rash" interbedded		[a] 3
Floor, clay.		
Thickness of bed	2	6
Thickness of coal sampled	1	10

[a] Not included in sample.

The sample was cut from face of butt entry, 250 feet north of mine mouth.

OLIVER SPRINGS. OLD MOUNT CARBON MINE.

Analysis 21421 (p. 102). Bituminous coal, from Old Mount Carbon mine, a small drift mine 2¼ miles north-northwest of Oliver Springs on the Southern and the Louisville & Nashville Railroads. Coal bed, Coal Creek; Carboniferous age, Briceville shale. Thickness, 2 feet 10 inches. Roof, shale; floor, clay. The bed was sampled by F. R. Clark on March 10, 1915. The sample was cut on rib in main entry, 75 feet east of mine mouth, and represented 2 feet 8 inches of slightly weathered coal that was bright, massive, and splintlike. There were 2 inches of rash and coal above the part sampled.

OLIVER SPRINGS. POPLAR CREEK MINE.

Analysis 21423 (p. 102). Bituminous coal, from Poplar Creek mine, a small drift mine 4 miles north-northwest of Oliver Springs on the Southern and the Louisville & Nashville Railroads. Coal bed, Coal Creek; Carboniferous age, Briceville shale. The bed was sampled by F. R. Clark on March 10, 1915, as described on page following.

Section of coal bed in Poplar Creek mine.

	Ft.	in.
Roof, sandy shale.		
Coal, bedded, with some "rash"		7
Clay		[a] 2
Coal, soft and bedded		7½
"Sulphur" kidney		½
Coal, hard and massive	2	8
Floor, clay.		
Thickness of bed	4	1
Thickness of coal sampled	3	11

[a] Not included in sample.

The sample was cut on rib, main entry, 400 feet north of mine mouth, and represented slightly weathered coal.

Oliver Springs. Prudential Mine.

Analyses 21412 to 21415 (p. 102). Bituminous coal, from Prudential mine, a drift mine 3½ miles northwest of Oliver Springs, on the Southern and Louisville & Nashville Railroads. Coal bed, Coal Creek; Carboniferous age, Briceville shale. Average thickness, 4 feet. The bed was sampled by F. R. Clark on March 9, 1915, as described below:

Sections of coal bed in Prudential mine.

Section	A		B		C	
Laboratory No.	21412		21413		21414	
	Ft.	in.	Ft.	in.	Ft.	in.
Roof, shale.						
"Rash" and lenses of "sulphur" interbedded	..	..		[a] 1½	..	..
Coal, laminated		3	..	..	..	..
Coal, soft and badly crushed		10	3	8½	4	4
Coal, massive	2	1	..	..	..	..
Floor, clay.						
Thickness of bed	3	2	3	10	4	4
Thickness of coal sampled	3	2	3	8½	4	4

[a] Not included in sample.

Section A (sample 21412) was measured at face of 13 left entry, 850 feet north and 2,300 feet northwest of mine mouth. The sample was damp. Section B (sample 21413) was measured in face of 12 left entry, 850 feet north and 2,000 feet northwest of mine mouth. Section C (sample 21414) was measured at face of 11 left entry, 850 feet north and 1,800 feet northwest of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 21412, 21413, and 21414 is given under laboratory No. 21415.

Oliver Springs. Reed Mine.

Analysis 21425 (p. 102). Bituminous coal from Reed mine, a drift mine 1 mile west-northwest of Oliver Springs, on the Southern and the Louisville & Nashville Railroads. Coal bed not identified; is below the Coal Creek; Carboniferous age, Lee (?) formation. Roof, shale; floor, fire clay. The sample was cut by F. R. Clark on March 10, 1915, at face of 2 right entry, 800 feet north and 500 feet east of mine mouth, and represented 1 foot 10 inches of massive hard coal, the upper 4 inches of which contained thin lenses of "rash" and "sulphur."

This mine was operated primarily for the clay underlying the coal bed. The coal was mined slightly in advance of the clay, and was used principally in the company's own power plant.

Oliver Springs. Richards Mine.

Analyses 21416, 21417, and 21418 (pp. 102–103). Bituminous coal, from Richards mine, a drift mine 3 miles northwest of Oliver Springs on the Southern and the Louis-

ville & Nashville Railroads. Coal bed, Coal Creek; Carboniferous age, Briceville shale. The bed was sampled by F. R. Clark on March 9, 1915, as described below:

Sections of coal bed in Richards mine.

Section	A	B
Laboratory No.	21416	21417
Roof, shale and sandy shale.		
"Rash" coal, and "sulphur" lenses, interbedded	.. ..	[a] 1 2
Coal, locally laminated, containing lenses of "sulphur"	1 8	10
Coal, crushed and soft	.. ..	1 4
"Sulphur" kidney	.. ..	[a] 3
Coal, crushed	.. ..	1 8½
Coal, dull and hard	4	.. ..
"Sulphur" kidney	.. ..	[a] 1
Coal, massive, but locally crushed	2 5	3 6
Floor, clay.		
Thickness of bed	4 5	8 10½
Thickness of coal sampled	4 5	7 4½

[a] Not included in sample.

Section A (sample 21416) was measured at face of main face entry. The sample was damp. Section B (sample 21417) was measured at face of main entry.

The ultimate analysis of a composite sample made by mixing face samples 21416 and 21417 is given under laboratory No. 21418.

OLIVER SPRINGS. SIGNAL MOUNTAIN MINE.

Analysis 21422 (p. 103). Bituminous coal from Signal Mountain mine, a small drift mine 2½ miles north-northwest of Oliver Springs on the Southern and the Louisville & Nashville Railroads. Coal bed, Coal Creek; Carboniferous age, Briceville shale. Roof, shale; floor, clay. The sample was cut by F. R. Clark on March 10, 1915, at face of main entry, 250 feet north of mine mouth, and represented 2 feet 7 inches of coal. The lower 2 feet was massive, hard, and bright coal; the upper 7 inches contained thin "sulphur" bands.

OLIVER SPRINGS. WILLIAMS MINE.

Analysis 21419 (p. 103). Bituminous coal, from Williams (wagon) mine, a drift mine 1½ miles north-northwest of Oliver Springs on the Southern and the Louisville & Nashville Railroads. Coal bed, Coal Creek; Carboniferous age, Briceville shale. The bed was sampled by F. R. Clark on March 10, 1915, as described below:

Section of coal bed in Williams mine.

	Ft. in.
Roof, shale.	
Coal and "rash" interbedded	5
Coal, bright, blocky, and hard	2 6
"Rash"	[a] 10
Floor, clay.	
Thickness of bed	3 9
Thickness of coal sampled	2 11

[a] Not included in sample.

The sample was cut in main entry, 100 feet west of mine mouth.

PETROS. FROZEN HEAD MINE.

Analysis 21083 (p. 103). Bituminous coal from Frozen Head mine, a drift mine 1½ miles north of Petros at terminus of the Harriman & Northeastern R. R. Coal bed, Frozen Head; Carboniferous age, Scott shale (?). The bed was sampled by F. R. Clark on February 18, 1915, as described on page following.

Section of coal bed in Frozen Head mine.

	Ft.	in.
Roof, shale.		
Coal, bright and laminated		6
Clay and "rash" interbedded		[a] 2
Coal, bright and laminated	1	2
Coal, dull, splint-like, and hard		6
Coal, massive, bright, and hard	1	0
Coal, "rashy"		1
Clay and coal lenses interbedded		[a] 1½
"Rash" and coal lenses interbedded		[a] 4
Clay		[a] 1
Coal, hard and bright		[a] 4
Floor, clay.		
Thickness of bed	4	3½
Thickness of coal sampled	3	3

[a] Not included in sample.

The sample was cut from a rib on main entry 900 feet north of mine mouth and represented slightly weathered coal. The mine had been inactive for several years but the coal apparently had deteriorated only a little.

Petros. Petros No. 5 Mine.

Analyses 21088 to 21091 (p. 103). Bituminous coal from Petros No. 5 mine, a drift mine 1 mile east of Petros, at the terminus of the Harriman & Northeastern R. R. Coal bed, Jellico; Carboniferous age, Briceville shale (?). Average thickness, 3 feet 6 inches. Roof, sandy shale; floor, shale. The bed was sampled by F. R. Clark on February 19, 1915, as described below:

Sections of coal bed in Petros No. 5 mine.

Section	A		B		C	
Laboratory No.	21088		21089		21090	
Roof, sandy shale.	Ft.	in.	Ft.	in.	Ft.	in.
Coal, locally laminated		6	1	0	..	..
Coal, "rashy"		1	..	..	..	..
Coal, massive		6¾	1	4	..	..
"Sulphur," kidney		¼	..	..	..	..
Coal, "rashy"	..	..	..	1	..	..
Coal, massive,[a] in places	1	5	1	1	2	4
Floor, shale.						
Thickness of bed	2	7	3	6	2	4
Thickness of coal sampled	2	7	3	6	2	4

[a] In places, hard; in places, carrying thin lenses of sulphur.

Section A (sample 21088) was measured at face of 2 right entry, 2,000 feet east-southeast of mine mouth. Section B (sample 21089) was measured at face of 3 left entry, about 2,500 feet north of mine mouth. Section C (sample 21090) was measured at face of 4 entry, 2,500 feet north-northeast of mine mouth.

The ultimate analysis of a composite sample, made by mixing face samples 21088, 21089, and 21090, is given under laboratory No. 21091.

Petros. State No. 3 Mine.

Analyses 21092 to 21096 (p. 103). Bituminous coal, from State No. 3 mine, a drift mine 1 mile north of Petros, at the terminus of the Harriman & Northeastern R. R., Coal bed, Jellico; Carboniferous age, Briceville shale (?). Average thickness, 3 to 4 feet. Roof, sandy shale and sandstone; floor shale. The bed was sampled by F. R. Clark on February 17-19, 1915, as described on page following.

Sections of coal bed in State No. 3 mine.

Section	A	B	C	D
Laboratory No	21092	21093	21094	21095
Roof, sandy shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal, hard, massive	.. ..	1¾	.. ..	8
Coal, laminated, locally contains "sulphur" lenses	9	1	4	2
"Mother coal"	1	.. ..	.. ..	.. ..
Coal, laminated	.. ..	6¼	.. ..	.. ..
Coal, massive, hard	.. ..	.. ..	.. ..	8
"Mother coal"	.. ..	2	.. ..	½
Coal, massive	.. ..	1 5	.. ..	.. ..
Coal, containing lenses of "mother coal"	.. ..	5	2 3	6
Coal, massive	1 10	1 5	.. ..	1 8
"Rash"	[a] 2	.. ..	.. ..	.. ..
Floor, clay.				
Thickness of bed	2 10	4 2	2 7	3 8½
Thickness of coal sampled	2 8	4 2	2 7	3 8½

[a] Not included in sample.

Section A (sample 21092) was measured at face of 15 cross entry, 3,500 feet N. 55° W. of main entry. Section B (sample 21093) was measured at face of 9 cross entry, 3,800 feet N. 55° W. of main entry. Section C (sample 21094) was measured at face of 8 cross entry, 4,500 feet S. 55° E. of main entry. Section D (sample 21095) was measured at face of 12 cross entry, 4,400 feet S. 55° E. of main entry.

The results of an ultimate analysis of a composite sample made by mixing face samples 21092, 21093, 21094, and 21095 is given under laboratory No. 21096.

Stephens. Laymance Mine.

Analysis 21149 (p. 103). Bituminous coal, from Laymance mine, a small drift mine 5 miles west of Stephens switch on the Harriman & Northeastern R. R. Coal bed, not named; Carboniferous age, Wartburg sandstone. Roof, sandy shale; floor, clay. The bed was sampled by F. R. Clark on February 24, 1915. The sample was cut on rib, main entry, 200 feet south of mine mouth, and represented 3 feet 2 inches of coal, the thickness of the bed. The lower 2½ feet was massive, hard coal, the upper 8 inches was soft, laminated coal. The coal was weathered and the sample was wet.

The coal is mined to supply near-by settlers.

Stephens. Little Brushy Mine.

Analyses 21084 to 21087 (p. 104). Bituminous coal, from Little Brushy mine, a drift mine half a mile southwest of Stephens on the Harriman & Northeastern R. R. Coal bed, Jellico; Carboniferous age, Briceville shale (?). Average thickness, 2 feet 9 inches. Roof, sandy shale; floor, sandstone. The bed was sampled by F. R. Clark, on February 20, 1915.

Sample 21084 was taken at mouth of 12 room, 1 entry, 2,600 feet S. 43° W. of the mine mouth and represented 1 foot 1 inch of coal that was laminated and contained thin bands of "sulphur," and 1 foot 7½ inches of bright, slightly laminated coal. Sample was wet. Sample 21085 was taken at face of dip entry, 2,600 feet S. 43° W. of mine mouth and represented 2 feet 11 inches of laminated coal containing bands of "sulphur," entire thickness of bed. Sample was damp. Sample 21086 was taken at mouth of 4 room, main entry, new opening, 2,650 feet S. 43° W. of mine mouth (old opening), and represented 2 feet 10 inches of laminated coal containing bands of "sulphur," entire thickness of bed. Sample was wet.

The ultimate analysis of a composite sample made by mixing face samples 21084, 21085, and 21086 is given under laboratory No. 21087.

OVERTON COUNTY.

HIGHLAND JUNCTION. OVERTON MINE.

Analyses 20978, 20979, 20980, and 20981 (p. 103). Bituminous coal, from Overton mine, a drift mine 2½ miles northwest of Highland Junction on the Crawford branch of the Tennessee Central R. R. Coal bed, Bon Air No. 2; Carboniferous age, Lee formation. Average thickness, 5 feet. Roof, sandy shale; floor, shale. The bed was sampled by F. R. Clark on February 10, 1915, as described below:

Sections of coal bed in Overton mine.

Section	A		B		C	
Laboratory No.	20978		20979		20980	
Roof, shale.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Coal		[a]3	..	..	..	..
"Sulphur" kidney		[a]1½	..	..	..	..
Coal, with bands of shale	..	..		[a]3		[a]2
Coal, laminated		7½	1	0	1	1
Coal, impure, containing "sulphur" kidneys		[a]1		[a]1		[a]2
Coal, massive	3	6½	3	6	3	4
Floor, shale or clay.						
Thickness of bed	4	7½	4	10	4	9
Thickness of coal sampled	4	2	4	6	4	5

[a] Not included in sample.

Section A (sample 20978) was measured at face of main straight entry, 460 feet southwest of mine mouth; sample was damp. Section B (sample 20979) was measured at face of main entry, 1,200 feet N. 20° W. of mine mouth; sample was damp. Section C (sample 20980) was measured in 1 left entry, 500 feet from mine mouth. This was a rib sample and therefore the coal was probably slightly weathered.

The ultimate analysis of a composite sample made by mixing face samples 20978, 20979, and 20980 is given under laboratory No. 20981.

OBEY CITY. OBEY RIVER MINE.

Analysis 20991 (p. 103). Bituminous coal, from Obey River mine, a drift mine one-half mile east of Obey City on the Crawford branch of the Tennessee Central R. R. Coal bed, Bon Air No. 2; Carboniferous age, Lee (?) formation. Average thickness, 2½ to 3 feet. Roof, sandy shale; floor, shale. The bed was sampled by F. R. Clark, on February 11, 1915.

Sample 20991 was collected at face of cross entry, 1 left entry, 500 feet northeast of mine mouth, and represented 2 feet 4½ inches of coal. The section included at the bottom 5 inches of "rash," which was excluded from the sample. The sample was cut from coal that had been exposed to the mine air for a considerable time and was probably slightly weathered.

The mine at the time of sampling was not in operation and had been idle for several months.

OBEY CITY. PEACOCK MINE.

Analysis 20992 (p. 104). Bituminous coal, from Peacock mine, a drift mine one-eighth mile west of Obey City station on the Crawford branch of the Tennessee Central R. R. Coal bed, Bon Air No. 2; Carboniferous age, Lee (?) formation. Thickness, 2⅓ to 2½ feet. Roof, sandstone; floor, shale. The bed was sampled by F. R. Clark on February 11, 1915. The sample was measured at the face of the cross entry, 1 right entry, 1,000 feet southwest of the mine mouth, and represented 2½ feet of massive coal, the entire thickness of the bed.

PUTNAM COUNTY.

MONTEREY. MONTEREY MINE.

Analysis 20990 (p. 104). Bituminous coal, from Monterey mine, a (wagon) drift mine 2 miles north of Monterey on the Tennessee Central R. R. Coal bed, Bon Air No. 2; Carboniferous age, Bon Air sandstone. Thickness reported to be 2½ to 4 feet. The bed was sampled by F. R. Clark February 12, 1915, as described below:

Section of coal bed in Monterey mine.

	Ft.	in.
Roof, sandstone.		
Coal, laminated		9½
Coal, locally containing "sulphur" balls		1
Coal, laminated	1	4
"Sulphur" kidney		a 1½
Coal	1	6½
"Rash"		a 5
Floor, shale.		
Thickness of bed	4	3½
Thickness of coal sampled	3	9

a Not included in sample.

The section (sample 20990) was measured at face of main entry, 200 feet south of mine mouth; the sample was damp.

RHEA COUNTY.

GRAYSVILLE. MONTAGUE NO. 1 MINE.

Analyses 22159 and 22165 (p. 104). Bituminous coal, from Montague No. 1 mine, a drift mine 2⅛ miles north of Graysville on the Cincinnati, New Orleans & Texas Pacific Ry. Coal bed, Nelson (upper bench); Carboniferous age, Lookout sandstone. The bed was sampled May 1, 1915, by F. R. Clark, as described below:

Sections of coal bed in Montague No. 1 mine.

Section	A		B	
Laboratory No.	22159		22165	
	Ft.	in.	Ft.	in.
Roof, sandy shale.				
Clay	..	..		a 4
"Rash"		a 2		a 2
Clay		a 1	..	..
Coal, impure and badly crushed	..	..		7
"Rash"		a 3	..	..
Shale	..	..		a 1
Coal, crushed and contorted	2	4	2	7
Floor, sandstone.				
Thickness of bed	2	10	3	9
Thickness of coal sampled	2	4	3	2

a Not included in sample.

Section A (sample 22159) was measured on air-course pillar, 2 haulage way, 1 main entry. Section B (sample 22165) was measured on chain pillar, main entry.

GRAYSVILLE. MONTAGUE NOS. 3, 5-A, AND 5-B MINES.

Analyses 22180 to 22184 (p. 104). Bituminous coal, from Montague Nos. 3, 5-A, and 5-B mines, drift mines 3, 2½, and 2½ miles north of Graysville on the Cincinnati, New Orleans & Texas Pacific Ry. Coal bed, Sewanee; Carboniferous age, "Walden sandstone." Roof and floor, sandstone and sandy shale. The bed was sampled on April 30, 1915, by F. R. Clark, as described on page following.

Sections of coal bed in Montague Nos. 3, 5–A, and 5–B mines.

Section	A	B	C	D
Laboratory No.	22180	22181	22182	22183
Roof, sandstone and sandy shale.				
Clay or coal and "rash"	.. ..	[a] 3	.. ..	[a] 2
Coal, laminated, badly crushed in places	1 10	3 4	2 11	2 11½
"Rash"	.. ..	[a] 1 0	.. ..	[a] 2
Floor, sandstone and sandy shale.				
Thickness of bed	1 10	4 7	2 11	3 3½
Thickness of coal sampled	1 10	3 4	2 11	2 11½

[a] Not included in sample.

Section A (sample 22180) was measured at face of 8 right entry, 3,200 feet N. 20° E. and 500 feet S. 70° E. of mouth of No. 3 mine. Section B (sample 22181) was measured at face of 2 right entry, 600 feet east of mouth of No. 5–A mine. Section C (sample 22182) was measured at face of 2 left entry, 1,200 feet north of mouth of No. 5–A mine. Section D (sample 22183) was measured on the pillar, 1 right entry, 600 feet south of mouth of No. 5–B mine.

The ultimate analysis of a composite sample made by mixing samples 22180 to 22183, inclusive, is given under laboratory No. 22184.

Graysville. Montague No. 6 Mine.

Analysis 22158 (p. 104). Bituminous coal, from Montague No. 6 mine, a slope mine 2 miles north of Graysville on the Cincinnati, New Orleans & Texas Pacific Ry. Coal bed, Nelson (lower bench); Carboniferous age, Lookout sandstone. Roof and floor, sandstone. The sample was cut on May 1, 1915, by F. R. Clark at face of 1 room, main entry, 400 feet west of mine mouth, and represented 2 feet 7 inches of steel gray, hard, brittle coal; 2 inches of sandy shale at the top of the bed were excluded from the sample.

ROANE COUNTY.

Harriman. Walden Ridge Mine.

Analysis 21082 (p. 105). Bituminous coal, from Walden Ridge mine, a small slope mine 2 miles northeast of Harriman on the Southern Ry. Coal bed, Walden Ridge; Carboniferous age, Walden formation. Roof, sandy shale; floor, hard clay. The sample was cut on February 16, 1915, by F. R. Clark at the face of 1 room, 1 right entry, 300 feet north of mine mouth, and represented 2½ feet of hard coal; 2 inches of rash at the top of the bed were excluded from the sample; sample was damp.

McLean. McLean Mine.

Analyses 21023, 21024, and 21025 (p. 105). Bituminous coal, from McLean mine, a slope mine three-fourths mile south of McLean siding on the Tennessee Central R. R. Coal bed, Sewanee; Carboniferous age, Walden sandstone. Roof, shale; floor, hard clay. The bed was sampled February 13, 1915, by F. R. Clark.

Sample 21023 was measured at the face of Sam Day's place, 3,000 feet N. 70° W. of mine mouth, and represented 4 feet 3 inches of crushed, "rashy" coal; at the top of the bed were 6 inches of "rash" and carbonaceous shale, interbedded, which were excluded from the sample. Sample 21024 was measured at the face of Hartberger's place, 700 feet northwest of mine mouth, and represented 4 feet of soft, badly crushed coal, entire thickness of bed.

The ultimate analysis of a composite sample made by mixing face samples 21023 and 21024 is given under laboratory No. 21025.

Owing to the crushed condition of the coal in this mine, the ash varies from about 9 per cent where there is little admixture of foreign material to more than 20 per cent where the shale is intimately mixed with the coal.

ROCKWOOD. ROCKWOOD MINE.

Analyses 18695 to 18698 and 21015 to 21019 (p. 105). Bituminous coal, from Rockwood mine, a slope mine three-fourths mile west of the Rockwood station on the Tennessee Central and the Queen & Crescent Railroads. Coal bed, Sewanee; Carboniferous age, Walden sandstone (?). Roof, blue shale; floor, hard underclay and conglomerate. The bed was sampled by E. B. Sutton on February 13, 1914.

Sample 18695 was cut from the face of 1 dip entry, 9 entry, and represented 4 feet 2 inches of clean coal, the thickness of the bed. Sample 18696 was cut from face of incline, 6 entry, and represented 5 feet 5 inches of clean coal, the thickness of the bed. Sample 18697 was cut from face of 2 entry and represented 5 feet 5½ inches, the thickness of the bed.

The ultimate analysis of a composite sample made by combining equal amounts of samples 18695, 18696, and 18697 is given under laboratory No. 18698.

Owing to the crushed condition of the coal in the Rockwood mine, the ash content varies greatly, ranging from about 9 per cent where there is little admixture of foreign material to more than 20 per cent where the shale is intimately mixed with the coal.

The bed was also sampled February 15, 1915, by F. R. Clark, as described below:

Sections of coal bed in Rockwood mine.

Section	A	B	C	D
Laboratory No.	21015	21016	21017	21018
	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Roof, shale and sandy shale.				
Coal, badly crushed	6	.. ..	.. ..	.. ..
Shale	[a] ½	.. ..	.. ..	.. ..
Coal, badly crushed	1 6¾	.. ..	.. ..	.. ..
Shale and coal, intermixed	[a] 4	.. ..	.. ..	.. ..
Coal, soft and badly crushed	2 6	3 0	4 10	4 ½
Floor, hard clay.				
Thickness of bed	4 11	3 0	4 10	4 ½
Thickness of coal sampled	4 6¾	3 0	4 10	4 ½

[a] Not included in sample.

Section A (sample 21015) was measured at face of Bill Mahorn's place, 2 entry, 10,500 feet northwest of mine mouth. Section B (sample 21016) was measured at face of Lee McNeil's place, 6 entry, 10,500 feet N. 20° W. of mine mouth. Section C (sample 21017) was measured at face of John Long's place, 9 entry, 11,500 feet N. 15° E. of mine mouth. Section D (sample 21018) was measured at face of W. T. Acuff's place, 10 entry, 6,500 feet north of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 21015, 21016, 21017, and 21018 is given under laboratory No. 21019.

The mine is worked on an irregular room-and-piller system. The coal was first undercut by hand and then broken down with a permissible explosive. The cuttings were loaded with the coal. The daily production was about 600 tons, all of which was run through a crusher and then washed and sent to the ovens to be coked. Owing to the crushed condition of the coal in this mine the ash varies from about 9 per cent where there is little admixture of foreign material to over 20 per cent where the shale is intimately mixed with the coal.

SCOTT COUNTY.

BEAR CREEK JUNCTION. PHILLIPS MINE.

Analyses 21154, 21155, and 21156 (p. 105). Bituminous coal from Phillips mine, a drift mine 2 miles north of Bear Creek Junction on the Cincinnati, New Orleans & Texas Pacific Ry. Coal bed, No. 4 of the Kentucky series; Carboniferous age, formation not identified. Roof, shale; floor, clay. The bed was sampled by F. R. Clark on March 1, 1915, as described on page following.

Sections of coal bed in Phillips mine.

Section	A	B
Laboratory No.	21154	21155
Roof, shale.		
Coal, bedded and hard	Ft. in. 1 0	Ft. in. 1 0
Bone	a 1 1	a 11
Coal, massive and hard	1 5	1 7
Floor, clay.		
Thickness of bed	3 6	3 6
Thickness of coal sampled	2 5	2 7

a Not included in sample.

Section A (sample 21154) was measured at face of 17 room, 2 right entry, 600 feet west and 1,100 feet north of mine mouth. Section B (sample 21155) was measured at mouth of 6 right entry, main entry, 1,800 feet west of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 21154 and 21155 is given under laboratory No. 21156.

The slack coal from the Phillips mine and the Wilson mine is run through a washer. A sample of the washed product was taken from a railroad car. The ultimate analysis of this sample is given under laboratory No. 21218.

Bear Creek Junction. Wilson Mine.

Analyses 21219, 21220, and 21221 (p. 105). Bituminous coal, from Wilson mine, a drift mine 2½ miles west of Bear Creek Junction on the Cincinnati, New Orleans & Texas Pacific Ry. Coal bed, No. 4 of the Kentucky series; Carboniferous age, formation not identified. Average thickness, 3 feet. Roof, shale; floor, clay. The bed was sampled by F. R. Clark on March 1, 1915, as described below:

Sections of coal bed in Wilson mine.

Section	A	B
Laboratory No.	21219	21220
Roof, shale.		
Coal, laminated and hard	Ft. in. 1 2	Ft. in. 1 7
Shale, with thin lenses of coal	.. ..	a 1 3
Bone and coal interbedded	a 9	a 5
Coal, massive and hard	1 5	1 7
"Rash," coal, and "sulphur" lenses interbedded	a 2	.. ..
Floor, clay.		
Thickness of bed	3 6	4 10
Thickness of coal sampled	2 7	3 2

a Not included in sample.

Section A (sample 21219) was measured at face of 7 room, 4 south entry, 200 feet west and 600 feet south of mine mouth. Section B (sample 21220) was measured at face of 10 room, 1 north entry, 700 feet north of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 21219 and 21220 is given under laboratory No. 21221.

The slack coal from the Wilson mine and the Phillips mine is run through a washer. A sample of the washed product was taken from a railroad car. The ultimate analysis of this sample is given under laboratory No. 21218.

Huntsville. Cross Mine.

Analysis 21222 (p. 106). Bituminous coal, from Cross mine, a drift (wagon) mine at Cross's crossing, 1½ miles northeast of Huntsville on the Tennessee Ry. Coal bed known as Paint Rock; Carboniferous age, Briceville shale. Roof, shale; floor, clay. The bed was sampled by F. R. Clark on March 4, 1915, as described on page following.

Section of coal bed in Cross mine.

	Ft.	in.
Roof, shale.		
Coal, bright and soft		5
Coal, dull and hard		3
Coal, massive, bright, and hard	1	0
Floor, clay.		
Thickness of bed	1	8
Thickness of coal sampled	1	8

The sample was cut at face of main entry, 100 feet northwest of mine mouth. The coal may have been slightly weathered.

JAKES TANK. JAKES BRANCH MINE.

Analysis 21226 (p. 106). Bituminous coal, from Jakes Branch mine, one-fourth mile west of Jakes Tank on the Tennessee Ry. Coal bed, known as Paint Rock; Carboniferous age, Briceville shale. Roof, sandy shale; floor, clay. The bed was sampled by F. R. Clark on March 3, 1915, as described below:

Section of coal bed in Jakes Branch mine.

	Ft.	in.
Roof, sandy shale.		
Coal, bright and soft		5
Coal, dull and hard		3
Coal, bright, massive, and hard	1	2
Floor, clay.		
Thickness of bed	1	10
Thickness of coal sampled	1	10

The sample was cut at the rib, 300 feet from the mouth of 2 right entry. The coal was slightly weathered.

JAKES TANK. OPOSSUM JAW MINE.

Analysis 21223 (p. 106). Bituminous coal, from Opossum Jaw mine, a small drift mine one-half mile south of Jakes Tank on the Tennessee Ry. Coal bed, known as Paint Rock; Carboniferous age, Briceville shale. Roof, shale; floor, clay. The sample was cut by F. R. Clark on March 3, 1915, at face of 2 right room, main entry, 100 feet south-southwest of mine mouth, and represented 1 foot 6 inches of hard, massive coal, and at the top 2 inches of coal containing thin lenses of "rash." The bed is 1 foot 8 inches thick and the coal was damp and slightly weathered.

NEWLAND. ARCH MOUNTAIN MINE.

Analysis 21272 (p. 106). Bituminous coal, from Arch Mountain mine, a small drift mine at Newland, the terminus of a branch of the Tennessee Ry. Coal bed, Jellico; Carboniferous age, Briceville shale. Roof, sandy shale; floor, clay. The bed was sampled by F. R. Clark on March 2, 1915, as described below:

Section of coal bed in Arch Mountain mine.

	Ft.	in.
Roof, sandy shale.		
Coal, massive	1	4
Shale, with thin lenses of coal interbedded		[a]7
Coal, massive	1	4
Floor, clay.		
Thickness of bed	3	3
Thickness of coal sampled	2	8

[a] Not included in sample.

The sample was cut at face of 2 left entry, 300 feet southwest, and 270 feet northwest and 140 feet southwest of mine mouth.

ROBBINS. CLAY NO. 1 MINE.

Analysis 21228 (p. 106). Bituminous coal, from Clay No. 1 mine, a drift mine 1 mile south of Robbins on the Cincinnati, New Orleans, & Texas Pacific Ry. Coal bed, Blue Gem (?); Carboniferous age, Wartburg sandstone (?). The bed was sampled by F. R. Clark on March 5, 1915, as described below:

Section of coal bed in Clay No. 1 mine.

	Ft.	in.
Roof, shale.		
"Rash"		[a] 5
Coal, massive and bright	1	5
Clay		[a] 1
Coal, bright		4
Floor, clay.		
Thickness of bed	2	3
Thickness of coal sampled	1	9

[a] Not included in sample.

The sample was cut at face of main entry, 1,000 feet south of mine mouth.
The mine is worked primarily for the clay that underlies the coal.

ROBBINS. HUGHETT MINE.

Analysis 21229 (p. 106). Bituminous coal, from Hughett mine, a small drift (wagon) mine one-half mile south of Robbins on the Cincinnati, New Orleans & Texas Pacific Ry. Coal bed, Blue Gem (?); Carboniferous age, Wartburg sandstone (?). Roof, shale; floor, clay. The sample was cut by F. R. Clark on March 5, 1915, at face of main entry, 300 feet east of mine mouth, and represented 1 foot 1 inch of hard, massive coal, the total thickness of the bed.

The mine is operated to supply local demand at Robbins.

ROBBINS. HUGHETT PROSPECT.

Analysis 21314 (p. 106). Bituminous coal, from Hughett prospect, a small drift 8 miles southeast of Robbins on the Cincinnati, New Orleans & Texas Pacific Ry. Coal bed, known as Mud Slip; Carboniferous age, Briceville shale (?). Roof, shale; floor, clay. The sample was cut by F. R. Clark on March 6, 1915, at the face of the main entry, 25 feet west of drift mouth, and represented 2 feet 9 inches of massive coal and 7 inches of soft, laminated coal, the total thickness of the bed being 3 feet 4 inches. The coal was weathered and the sample was wet.

ROBBINS. LONG PROSPECT.

Analysis 21316 (p. 106). Bituminous coal, from Long prospect, a small drift prospect 6 miles southeast of Robbins on the Cincinnati, New Orleans & Texas Pacific Ry. Coal bed, not identified; Carboniferous age, Briceville shale. Roof, shale; floor, clay. The sample was cut by F. R. Clark on March 6, 1915, at face of main entry, 20 feet north of drift mouth, and represented 2 feet of massive coal. There was 4 inches of "rash" and coal above the part sampled, the bed being 2 feet 4 inches thick. The coal was weathered.

ROBBINS. NEWMAN PROSPECT.

Analysis 21315 (p. 106). Bituminous coal, from Newman prospect, a small drift prospect 6 miles south-southeast of Robbins on the Cincinnati, New Orleans & Texas Pacific Ry. Coal bed, not named; Carboniferous age, Briceville shale (?). Roof, shale; floor, clay. The bed was sampled by F. R. Clark on March 6, 1915, as described on page following.

Section of coal bed in Newman prospect.

	Ft.	in.
Roof, shale.		
Coal, massive and blocky	1	8
Shale	a 1	5
Coal, containing some "rash"	1	0
Coal, massive and blocky	2	2
Floor, clay.		
Thickness of bed	6	3
Thickness of coal sampled	4	10

a Not included in sample.

The sample was cut at face of main entry, 200 feet south of drift mouth; the coal was weathered and the sample was damp.

STANLEY JUNCTION. KEATON BROTHERS MINE.

Analysis 21227 (p. 107). Bituminous coal, from Keaton Brothers mine, a small drift mine 1,000 feet northwest of Stanley Junction on the Tennessee Ry. Coal bed, Paint Rock; Carboniferous age, Briceville shale. The bed was sampled by F. R. Clark on March 4, 1915, as described below:

Section of coal bed in Keaton Brothers mine.

	Ft.	in.
Roof, sandy shale.		
Shale, containing thin coal lenses	a 1	2
Coal, bright and soft		6
Coal, dull and hard		1
Coal, massive, bright, and hard	1	9
Floor, clay.		
Thickness of bed	3	6
Thickness of coal sampled	2	4

a Not included in sample.

The sample was cut in main entry, 200 feet south-southwest of mine mouth. Coal was slightly weathered.

STANLEY JUNCTION. PUMPKIN HOLLOW MINE.

Analysis 21225 (p. 107). Bituminous coal, from Pumpkin Hollow mine, a small drift mine one-fourth mile southwest of Stanley Junction on the Tennessee Ry. Coal bed, Paint Rock; Carboniferous age, Briceville shale. Roof, shale; floor, clay. The bed was sampled by F. R. Clark on March 4, 1915, as described below:

Section of coal bed in Pumpkin Hollow mine.

	Ft.	in.
Roof, sandy shale.		
Shale, with thin lenses of coal		a 4
Coal, bright and soft		4
Coal, dull and hard		2
Coal, massive, bright, and hard	1	9
Floor, clay.		
Thickness of bed	2	7
Thickness of coal sampled	2	3

a Not included in sample.

The sample was cut in main entry, 250 feet west of mine mouth; the coal may have been slightly weathered.

STANLEY JUNCTION. SEXTON MINE.

Analysis 21224 (p. 107). Bituminous coal, from Sexton mine, a small drift mine 1,000 feet east of Stanley Junction on the Tennessee Ry. Coal bed, Paint Rock; Car-

boniferous age, Briceville shale. Roof, sandy shale; floor, clay. The bed was sampled by F. R. Clark on March 4, 1915, as described below:

Section of coal bed in Sexton mine.

	Ft.	in.
Roof, sandy shale.		
Bone and shale interbedded		[a] 9
Coal, bright and soft		4
Coal, dull and hard		2
Coal, massive, bright, and hard	1	10
Floor, clay.		
Thickness of bed	3	1
Thickness of coal sampled	1	4

[a] Not included in sample.

The sample was cut at face of main entry, 200 feet northeast of mine mouth.

SEQUATCHIE COUNTY.

DUNLAP. DOUGLAS NO. 2 MINE.

Analyses 22239 to 22242 (p. 107). Bituminous coal, from Douglas No. 2 mine, a drift mine 2 miles west of Dunlap on the Pikeville branch of the Nashville, Chattanooga & St. Louis Ry. Coal bed, Sewanee; Carboniferous age, "Walden sandstone." Roof, shale and sandy shale; floor, shale. The bed was sampled May 12, 1915, by F. R. Clark, as described below:

Sections of coal bed in Douglas No. 2 mine.

Section	A		B		C	
Laboratory No.	22239		22240		22241	
Roof, shale and sandy shale.	Ft.	in.	Ft.	in.	Ft.	in.
Shale, carbonaceous	--	--	--	--		[a] 2
Coal, bright and laminated, "rashy" in places	1	1		7		4
Coal, steel-gray and hard	--	--	1	0	--	--
Coal, lustrous and contorted, with bands of dull coal in places	4	3		6	3	10
Shale and bone		[a] 1	--	--	--	--
"Rash" and coal interbedded	--	--		[a] 4	--	--
Coal, laminated and soft		[a] 2		10	--	--
Floor, shale.						
Thickness of bed	5	7	3	8	4	4
Thickness of coal sampled	5	4	2	11	4	2

[a] Not included in sample.

Section A (sample 22239) was measured at face of 9 north entry, 22 west entry, 4,500 feet N. 9° 34′ W., 2,350 feet S. 19° 21′ W., and 1,600 feet N. 39° 34′ W. of mine mouth. Section B (sample 22240) was measured at face of 6 north entry, 22 west entry, 4,500 feet N. 9° 34′ W., 1,675 feet S. 19° 21′ W., and 1,800 feet N. 9° 34′ W. of mine mouth. Section C (sample 22241) was measured at the face of 32 room, 10 north entry, 22 west entry, 4,500 feet N. 9° 34′ W., 2,400 feet S. 19° 21′ W., and 1,300 feet N. 9° 34′ W. of mine mouth.

The ultimate analysis of a composite sample made by mixing face samples 22239, 22240, and 22241 is given under laboratory No. 22242.

WHITE COUNTY.

BON AIR. BON AIR MINE.

Analyses 22365 to 22369 (p. 107). Bituminous coal, from Bon Air mine, a shaft mine 212 feet deep, 1¼ miles south of Bon Air on the Sparta branch of the Nashville, Chattanooga & St. Louis Ry. Coal bed, Bon Air (lower bench); Carboniferous age, formation not identified. Roof, shale; floor, shale. The bed was sampled May 24, 1915, by F. R. Clark, as described on page following.

Sections of coal bed in Bon Air mine.

Section	A	B	C	D
Laboratory No.	22365	22366	22367	22369
Roof, shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal, lustrous and hard	.. ..	.. ..	.. ..	2
Bone	.. ..	.. ..	.. ..	[a] ½
Coal, cannel	.. ..	.. ..	.. ..	7
Coal, massive, bright, and hard	2 7	2 11½	[a] 3 0	2 6
Floor, shale.				
Thickness of bed	2 7	2 11½	3 0	3 3½
Thickness of coal sampled	2 7	2 11½	3 0	3 3

[a] Bed contained thin bands of "sulphur."

Section A (sample 22365) was measured at face of main airway, 2,020 feet S. 41° E. of shaft. Section B (sample 22366) was measured at face of 2 east entry, 200 feet S. 41° E. and 900 feet southwest of shaft. Section C (sample 22367) was measured at face of main west entry, 1,030 feet N. 41° W. and 400 feet N. 13° W. of shaft.

The ultimate analysis of a composite sample made by mixing face samples 22365, 22366, and 22367, is given under laboratory No. 22368.

Section D (sample 22369) was measured on rib, 3 east entry, 200 feet from main entry, or 592 feet S. 41° E. and 185 feet N. 49° E. of shaft. This rib had been exposed to the mine air for a considerable time and the coal may have been slightly weathered.

Clifty. Clifty No. 1 Mine.

Analyses 22388 to 22392 (p. 107). Bituminous coal, from Clifty No. 1 mine, a drift mine one-fourth mile east of Clifty at the terminus of the Sparta branch of the Nashville, Chattanooga & St. Louis Ry. Roof, sandstone; floor, shale. Coal bed, Sewanee(?); Carboniferous age, "Walden sandstone" (?). The bed was sampled May 26, 1915, by F. R. Clark, as described below:

Sections of coal bed in Clifty No. 1 mine.

Section	A	B	C	D
Laboratory No.	22388	22389	22390	22391
Roof, Sandstone.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal, laminated	10	.. ..	7	8½
Coal, bright and hard	.. ..	9	.. ..	.. ..
"Sulphur"	.. ..	[a] ½	.. ..	.. ..
Coal, massive and hard	1 3	1 6	2 6	1 0
Sulphur	.. ..	[a] ½	.. ..	[a] 1½
Coal, soft	1 5	.. ..	.. ..	2 2
Coal, massive and hard	.. ..	1 0	.. ..	.. ..
Floor, shale.				
Thickness of bed	3 6	3 4	3 1	4 0
Thickness of coal sampled	3 6	3 3	3 1	3 10½

[a] Not included in sample.

Section A (sample 22388) was measured at face of 1 west entry, 3,450 feet N. 5° W., 3,225 feet N. 86° W., and 3,150 feet west of mine mouth. The sample was wet. Section B (sample 22389) was measured at face of 8 west entry, 3,450 feet N. 5° W., 3,225 feet N. 86° W., 1,750 feet north, and 1,950 feet west of mine mouth. Section C (sample 22390) was measured at face of 3 main air course, 3,450 feet N. 5° W., 3,225 feet N. 86° W., 2,150 feet west, and 1,050 feet north of mine mouth. The sample was wet. Section D (sample 22391) was measured at face of 3 west entry, 3,450 feet N. 5° W., 3,225 feet N. 86° W., 2,150 feet west, 425 feet north, and 280 feet west of mine mouth. The sample was wet.

The ultimate analysis of a composite sample made by mixing face samples 22388, 22389, 22390, and 22391, is given under laboratory No. 22392.

RAVENSCROFT. RAVENSCROFT MINE.

Analyses 22393 to 22397 (p. 108). Bituminous coal from Ravenscroft mine, a shaft mine, ⅝ mile northeast of Ravenscroft on a spur of the Sparta branch of the Nashville, Chattanooga & St. Louis Ry. Coal bed, Bon Air (?); Carboniferous age; formation not identified. Shaft, 178 feet deep. The bed was sampled May 25, 1915, by F. R. Clark, as described below:

Sections of coal bed in Ravenscroft mine.

Section	A	B	C	D
Laboratory No.	22393	22394	22395	22396
Roof, sandstone.	Ft. in.	Ft. in.	Ft. in.	Ft in.
Coal, lustrous	.. ..	.. ..	.. 3	.. ..
Coal, with thin lenses of "sulphur"	.. ..	.. ..	1 5	.. ..
"Sulphur" lenses	.. ..	.. ..	[a] ½	.. ..
Coal, massive and hard, locally containing thin bands of "sulphur" and mineral charcoal	4 2	3 8	1 11	4 9
"Sulphur"	.. ..	.. ..	[a] ½	.. ..
Clay	[a] 2	.. ..	.. ..	.. ..
Coal, massive and hard	.. ..	.. ..	10	.. ..
"Rash"	[a] 4	.. ..	..	.. ..
Floor, shale.				
Thickness of bed	4 8	3 8	4 6	4 9
Thickness of coal sampled	4 2	3 8	4 5	4 9

[a] Not included in sample.

Section A (sample 22393) was measured at face of cross entry, Will Marr entry, 1,500 feet northeast of shaft. Section B (sample 22394) was measured at face of room, Kelley entry, 2,000 feet north of shaft. Section C (sample 22395) was measured at face of Campbell entry, 2,700 feet east of shaft. Section D (sample 22396) was measured in room in new west workings, 1,700 feet west of shaft.

The ultimate analysis of a composite sample made by mixing face samples 22393, 22394, 22395, and 22396, is given under laboratory No. 22397.

UTAH.

CARBON COUNTY.

CARBON. PANTHER MINE.

Analysis 19881 (p. 108). Bituminous coal, Book Cliffs field, from Panther mine, a slope mine in SE. ¼ SE. ¼ sec. 1, T. 13 S., R. 9 E., 1¼ miles north of Carbon post office, on the Denver & Rio Grande R. R. Coal bed, Castlegate; Upper Cretaceous age, Mesaverde formation. Roof and floor are shale. The bed was sampled September 25, 1914, by F. R. Clark, as described below:

Section of coal bed in Panther mine.

	Ft. in.
Roof, shale.	
Coal	[a] 4
Bone	[a] 5
Coal	6 2½
Floor, shale.	
Thickness of bed	6 11½
Thickness of coal sampled	6 2½

[a] Not included in sample.

The section was measured at face of 2 east entry, main slope, 1,000 feet N. 45° E. and 500 feet east of mine mouth.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, p. 302.

CASTLEGATE. CAMERON NO. 1 MINE.

Analysis 19880 (p. 108). Bituminous coal, Book Cliffs field, from Cameron No. 1 mine, a slope mine in sec. 35, T. 12 S., R. 9 E., 1½ miles northwest of Castlegate, on the Denver & Rio Grande R. R. Coal bed, No. 1; Upper Cretaceous age, Mesaverde formation. The bed was sampled September 24, 1914, by F. R. Clark, as described below:

Section of coal bed in Cameron No. 1 mine.

	Ft.	in.
Coal, left as roof	[a]	8
Coal	5	6½
Coal, left as floor	[a]	6
Thickness of bed	6	8½
Thickness of coal sampled	5	6½

[a] Not included in sample.

The section was measured in 2 left entry, main entry, 800 feet S. 50° W. of mine mouth.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, p. 338.

CASTLEGATE. CAMERON NO. 2 MINE.

Analysis 19879 (p. 108). Bituminous coal, Book Cliffs field, from Cameron No. 2 mine, a slope mine in NE. ¼ sec. 35, T. 12 S., R. 9 E., 1 mile northwest of Castlegate, on the Denver & Rio Grande R. R. Coal bed, No. 2; Upper Cretaceous age, Mesaverde formation. Roof and floor are shale. The bed was sampled September 24, 1914, by F. R. Clark, as described below:

Section of coal bed in Cameron No. 2 mine.

	Ft.	in.
Roof, shale.		
Coal, not mined, reported	[a] 2	0 ±
Bone	[a]	4
Coal	5	0
Coal, cut by machine	[a]	6½
Coal, left as floor, estimated	[a]	9
Floor, shale.		
Thickness of bed	8	7½ ±
Thickness of coal sampled	5	0

[a] Not included in sample.

The section was measured at the face of main rise entry, 900 feet S. 85° W. of mine mouth.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, p. 338.

CASTLEGATE. CASTLEGATE NO. 1 MINE.

Analyses 19844, 19846, and 19847 (p. 108). Bituminous coal, Book Cliffs field, from Castlegate No. 1 mine, in NW. ¼ sec. 1, T. 13 S., R. 9 E., at Castlegate on the Denver & Rio Grande R. R. Coal beds, "A," "C," and "D"; Upper Cretaceous age, Mesaverde formation. Roof and floor of each bed is sandstone. Roof of A bed in mine is coal. Each bed was sampled at one point on September 22, 1914, by F. R. Clark.

Sample 19844 was cut from "D" bed in 1 right entry, 1 dip entry, 5,400 feet S, 66° W., and 1,400 feet N. 45° W. of mine mouth, and represented 5 feet of coal, the lower 2 inches of which was excluded from the sample.

Sample 19846 was cut from "C" bed in 18 room, 4 right entry, 1 rise entry, 5,400 feet S. 66° W., and 1,900 feet S. 45° W. of mine mouth, and represented 5 feet 7 inches of coal. The section included 3 inches of bone, which was excluded from the sample.

The "A" bed was sampled as described on page following.

Section of "A" bed in Castlegate No. 1 mine.

Laboratory No.	19847
	Ft. in.
Roof, sandstone; roof in mine, coal.	
Coal	[a] 8±
Coal	7 4½
Bone	[a] 3
Floor, sandstone.	
Thickness of bed	8 3½±
Thickness of coal sampled	7 4½

[a] Not included in sample.

The section (sample 19847) was measured on the entry stump, 12 level, 10 rise entry, 4,000 feet S. 66° W., 4,650 feet S. 4° W., and 200 feet S. 80° E. of mine mouth.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, p. 302.

CASTLEGATE. CASTLEGATE NO. 2 MINE.

Analyses 19843 and 19845 (p. 109). Bituminous coal, Book Cliffs field, from Castlegate No. 2 mine, a drift mine in NW. ¼ sec. 6, T. 13 S., R. 10 E., three-fourths mile northeast of Castlegate on the Denver & Rio Grande R. R. Coal beds, "B" and "D"; Upper Cretaceous age, Mesaverde formation. Roof and floor of "B" bed are sandstone. Roof and floor of "D" bed in mine is coal. Each bed was sampled at one point on September 23, 1914, by F. R. Clark, as described below:

Section of "D" bed in Castlegate No. 2 mine.

Laboratory No.	19843
	Ft. in.
Coal (left up)	[a]
Bone	[b] ½
Coal	3 3
Bone	[b] 1
Coal	3
Bone	[b] ½
Coal	3 4
Coal, cut by machine	[b] 6
Coal (not mined)	[a]
Thickness of coal mined	7 6
Thickness of coal sampled	6 10

[a] Thickness unknown; not included in sample. [b] Not included in sample.

Sample 19843 was taken in 1 left main entry, 1 rise entry, 3,200 feet south of mine mouth.

Section of "B" bed in Castlegate No. 2 mine.

Laboratory No.	19845
	Ft. in.
Roof, sandstone.	
Coal	[a] 6
Bone	[a] 3
Coal	6
Bone	[a] 3
Coal	7
Bone	[a] 2
Coal	3 5
Bone	[a] 5
Coal	8+
Coal, thickness unknown.	
Floor, sandstone.	
Thickness of coal measured	6 9+
Thickness of coal sampled	5 2

[a] Not included in sample.

Sample 19845 was taken at the face of 4 right entry, 1 rise entry, 1,700 feet S. 30° E. of mine mouth.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, p. 302.

HELPER. PROSPECT.

Analysis 19837 (p. 109). Bituminous coal, Book Cliffs field, from prospect drift in Hardscrabble Canyon in SW. ¼ NE. ¼ sec. 10, T. 13 S., R. 9 E., 3 miles northwest of Helper on the Denver & Rio Grande R. R. Coal bed, Spring Canyon No. 1; Upper Cretaceous age, Mesaverde formation. Roof, sandy shale; floor, sandstone. The sample was cut September 19, 1914, by F. R. Clark at face of main entry, 350 feet S. 35° W. of mine mouth, and represented 4 feet ½ inch of coal. The coal was probably slightly weathered.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, p. 338.

HELPER. PROSPECT.

Analysis 19838 (p. 109). Bituminous coal, Book Cliffs field, from prospect drift in Hardscrabble Canyon, in SW. ¼ NE. ¼ sec. 10, T. 13 S., R. 9 E., 3 miles northwest of Helper on the Denver & Rio Grande R. R. Coal bed, Spring Canyon No. 1; Upper Cretaceous age, Mesaverde formation. Roof, sandy shale; floor, sandstone. The sample was cut on September 19, 1914, by F. R. Clark at face of main entry, 400 feet S. 70° W. of mine mouth, and represented 4 feet of coal, the thickness of the bed. This prospect is near the one from which sample 19837 was taken, and the coal is from the same bed as that sample.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, p. 338.

KENILWORTH. ABERDEEN PROSPECT.

Analysis 19702 (p. 109). Bituminous coal, Book Cliffs field, from Aberdeen prospect, in SW. ¼ sec. 10, T. 13 S., R. 10 E., 1½ miles northeast of Kenilworth, the terminus of the Kenilworth & Helper R. R. Coal bed, "Aberdeen;" Upper Cretaceous age, Mesaverde formation. Roof and floor, sandstone; floor in mine is coal. The bed was sampled July 23, 1914, by F. R. Clark, as described below:

Section of coal bed in Aberdeen prospect.

	Ft.	in.
Roof, sandstone.		
Shale, 3 inches.		
Coal	10	10
Coal	[a]3	4
Floor, sandstone; floor in mine, coal.		
Thickness of bed	14	2
Thickness of coal sampled	10	10

[a] Not included in sample.

The section was measured 460 feet west of mine mouth.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, p. 351.

KENILWORTH. KENILWORTH MINE.

Analyses 19680, 19681, 19682, 19710, 19711, and 19712 (p. 109). Bituminous coal, Book Cliffs field, from Kenilworth mine, a slope mine in NW. ¼ sec. 16, T. 13 S., R. 10 E., three-fourths mile north of Kenilworth, the terminus of the Helper & Kenilworth R. R. Coal beds, Aberdeen, Kenilworth, and Royal Blue; Upper Cretaceous age, Mesaverde formation. Roof and floor of Aberdeen and Kenilworth beds are sandstone; roof of Royal Blue bed is sandstone, floor is shale and sandstone. Each bed was sampled at two points in July, 1914, by F. R. Clark, as described on page following.

Sections of Aberdeen bed in Kenilworth mine.

Section	A	B
Laboratory No.	19680	19711
Roof, sandstone.	Ft. in.	Ft. in.
Coal	(a)	(a)
Coal	6 10	16 2
Coal	(a)	.. ..
Floor, sandstone.		
Thickness of bed	.. ..	.. ..
Thickness of coal sampled	6 10	16 2

a Not included in sample.

Section A (sample 19680) was measured at face of 10 right entry, 4,750 feet from mine mouth. Section B (sample 19711) was measured in 7 room, 9 left entry, 4,030 feet from mine mouth.

Sections of Kenilworth bed in Kenilworth mine.

Section	A	B
Laboratory No.	19681	19712
Roof, sandstone.	Ft. in.	Ft. in.
Coal	a 2 0	.. ..
Shale, sandy	a 3 0	.. ..
Coal	a 2 0	(a)
Coal	8 0	7 0
Coal	(a)	a 1 0±
Floor, sandstone.		
Thickness of bed	15 0	8 0±
Thickness of coal sampled	8 0	7 0

a Not included in sample.

Section A (sample 19681) was measured at face of main slope, 2,930 feet from mine mouth. Section B (sample 19712) was measured at face of 1 left back entry, 2,800 feet from mine mouth.

Sections of Royal Blue bed in Kenilworth mine.

Section	A	B
Laboratory No.	19682	19710
Roof, sandstone.	Ft. in.	Ft. in.
Coal, soft	.. ..	8
Coal, dull and hard	.. ..	2
Coal, bright and hard	.. ..	1 8
Bone	.. ..	½
Coal, bright and hard	.. ..	1 8
Bone	.. ..	1
Coal	5 7	a 2 3
Floor, shale and sandstone.		
Thickness of bed	5 7	6 6½
Thickness of coal sampled	5 7	6 6½

a Very hard.

Section A (sample 19682) was measured at face of 1 right entry, up new tunnel, 2,400 feet from mine mouth. Section B (sample 19710) was measured in 3 room, 2 west entry, 850 feet from mine mouth.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, p. 350.

Kenilworth. Milburn Prospect.

Analysis 19706 (p. 109). Bituminous coal, Book Cliffs field, from Milburn prospect, in SW. ¼ sec. 11, T. 13 S., R. 10 E. 2¼ miles northeast of Kenilworth, the terminus of the Kenilworth & Helper R. R. Coal bed, Kenilworth; Upper Cretaceous age, Mesaverde formation. Thickness, about 11 feet. Roof, shale; floor not exposed in drift. The sample was cut on July 23, 1914, by F. R. Clark at the face of the entry,

100 feet N. 55° W., and 90 feet north of mine mouth, and represented 6 feet 4 inches of coal. There was 4 feet 10 inches of coal below the part sampled.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, p. 338.

STANDARDVILLE. STANDARD MINE.

Analyses 19988 and 19989 (p. 109). Bituminous coal, Book Cliffs field, from Standard mine, a drift mine in SW. ¼ NE. ¼ sec. 8, T. 13 S., R. 9 E., at Standardville, the terminus of the Spring Canyon R. R. Coal bed, Castlegate; Upper Cretaceous age, Mesaverde formation. Thickness about 15 feet. Roof and floor are sandstone. The bed was sampled October 17, 1914, by F. R. Clark, as described below:

Sections of coal bed in Standard mine.

Section	A	B
Laboratory No.	19988	19989
	Ft. in.	Ft. in.
Roof, sandstone.		
Coal (left up)	[a] t 0	.. ..
Coal	8 2	[a] 8 0±
Coal, cannel	1	[a] 1
Bone	[a] 1½	[a] 8
Coal	[a] 5 8	1 8
Bone	.. ..	[a] 1
Coal	.. ..	3 4
Coal	.. ..	[a] 10
Floor, sandstone.		
Thickness of bed	15 ½	14 8±
Thickness of coal sampled	8 3	5 0

[a] Not included in sample.

Section A (sample 19988) was measured in crosscut, 200 feet S. 50° E. of face of fanway, and 1,450 feet N. 50° W. of mine mouth. Section B (sample 19989) was measured 150 feet from face of main fanway, and 1,550 feet N. 50° W. of mine mouth.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, p. 352.

STORRS. SPRING CANYON NO. 1 MINE.

Analysis 19986 (p. 109). Bituminous coal, Book Cliffs field, from Spring Canyon No. 1 mine, a slope mine in NE. ¼ SW. ¼ sec. 9, T. 13 S., R. 9 E., near Storrs, on the Spring Canyon R. R. Coal bed, Spring Canyon No. 1; Upper Cretaceous age, Mesaverde formation. The bed was sampled October 16, 1914, by F. R. Clark, as described below:

Section of coal bed in Spring Canyon No. 1 mine.

	Ft.	in.
Roof, shale.		
Coal	6	4
Bone		[a] 2
Coal	2	2
Coal		[a] 4
Floor, sandstone.		
Thickness of bed	9	0
Thickness of coal sampled	8	6

[a] Not included in sample.

The section was measured at face of 4 right entry, main entry, 1,720 feet N. 32° W. of mine mouth.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, p. 338.

STORRS. SPRING CANYON NO. 2 MINE.

Analysis 19987 (p. 109). Bituminous coal, Book Cliffs field, from Spring Canyon No. 2 mine, in NW. ¼ sec. 9, T. 13 S., R. 9 E., near Storrs on the Spring Canyon R. R. Coal bed, Spring Canyon No. 2; Upper Cretaceous age, Mesaverde formation. Roof and floor are shale. The sample was cut October 17, 1914, by F. R. Clark at face of

main entry, 810 feet east of mine mouth, and represented 4 feet 2½ inches of coal, the thickness of the bed.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, p. 338.

STORRS. SPRING CANYON NO. 3 MINE.

Analysis 19990 (p. 109). Bituminous coal, Book Cliffs field, from Spring Canyon No. 3 mine, in NW. ¼ sec. 9, T. 13 S., R. 9 E., 1 mile northwest of Storrs, on the Spring Canyon R. R. Coal bed, Spring Canyon No. 3; Upper Cretaceous age, Mesaverde formation. Roof and floor are sandstone. The bed was sampled October 17, 1914, by F. R. Clark, as described below:

Section of coal bed in Spring Canyon No. 3 mine.

	Ft.	in.
Roof, sandstone.		
Coal	3	10
Bone		[a] ½
Coal	3	10
Coal		[a] 8
Floor, sandstone.		
Thickness of bed	8	4½
Thickness of coal sampled	7	8

[a] Not included in sample.

The section was measured at face of main entry.

SUNNYSIDE. NO. 3 MINE.

Analyses 17604 and 17605 (p. 110). Bituminous coking coal, Book Cliffs field, from No. 3 mine, in SW. ¼ SW. ¼ sec. 4, T. 15 S., R. 14 E., 1 mile southeast of Sunnyside, on branch of Denver & Rio Grande R. R.; connected with the railroad by the main haulage way through No. 2 mine. Coal beds, Lower and Upper; Cretaceous age, Mesaverde formation. Each bed was sampled by F. R. Clark on August 5, 1913.

Sample 17604, from the Lower bed, was cut from the face of 2 left entry, "in the dips" about 150 feet inside of 1 room and about 1 mile northeast of the mine opening. The bed at this point is 9 feet 10 inches thick, but the upper 1 foot and the lower 2 feet were excluded from the sample.

Sample 17605, from the Upper bed, was cut from the face of 5 room, 2 right entry, about 1 mile south of mine opening. The whole thickness, 5 feet 4 inches, of the coal was included in the sample.

The beds at the points sampled were free from partings and the coal was black and massive. Most of the output was coked. The coals from each bed seem to have about the same coking tendencies, so that no attempt was made to keep them separate. They were sent to the tipple, screened, and either loaded on cars to be shipped to market or were crushed for treatment in the coke ovens.

For analyses and descriptions of the Sunnyside coals see Bureau of Mines Bull. 22, 1913, pp. 191, 800; Bull. 85, 1914, pp. 103, 324.

For geologic relations of these coals see U. S. Geol. Survey Bull. 285, 1906, p. 295.

EMERY COUNTY.

BLACK HAWK. BLACK HAWK MINE.

Analyses 22350 to 22357 and 22414 (p. 110). Bituminous semicoking coal, Book Cliff field, Castle Valley district, from Black Hawk mine, a slope mine in sec. 4, T. 16 S., R. 8 E., three-fourths mile from Black Hawk on Utah R. R. Coal bed, Hiawatha; Upper Cretaceous age, Mesaverde formation. Thickness, 13 to 25 feet. Roof and floor, hard feldspathic sandstone; dip, 2° SW. The bed was sampled by J. C. Roberts on March 2, 1915, as described on page following.

Sections of coal bed in Black Hawk mine.

Section	A	B	C	D	E	F	G	H
Laboratory No.	22350	22351	22352	22353	22354	22355	22356	22414
Roof, sandstone.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal (left up)	a 8 6	a 4 6	a 5 0	a 5 0	a 4 0	a 4 0	a 4 0	a 5 0
Coal	12 0	12 0	12 6	12 6	10 0	13 0	10 0	12 0
Coal (not mined)	.. ..	.. ..	.. ..	.. ..	a 4 0	a 5 0	a 4 0	.. ..
Floor, sandstone.								
Thickness of bed	20 6	16 6	17 6	17 6	18 0	22 0	18 0	17 0
Thickness of coal sampled	12 0	12 0	12 6	12 6	10 0	13 0	10 0	12 0

a Not included in sample.

Section A (sample 22350) was measured at face of 3 west main entry. Section B (sample 22351) was measured at face of Carbon entry. Section C (sample 22352) was measured at face of 13 room, 1 east main entry. Section D (sample 22353) was measured at face of 16 room, 1 east entry, back entry. Section E (sample 22354) was measured at face of 3 east entry. Section F (sample 22355) was measured at face of main entry in Mexico entry. Section G (sample 22356) was measured at face of 2 west entry. Section H (sample 22414) was measured from 4 pillar in Carbon entry.

The ultimate analysis of a composite sample made by combining face samples 22350 to 22356, inclusive, is given under laboratory No. 22357.

Room-and-pillar system of mining. In 1915 the coal was undercut by machine and shot down with permissible explosives after the miners were out. The output was 1,500 to 1,800 tons per day, 25 per cent of which was from advance workings. A dike about 3 feet thick cuts the vein between Carbon and Emery entries (2 and 3 west) and there is about 15 inches of coke on each side of the dike. Only a few pillars had been pulled, and they were close to the outcrop. The mine was kept continuously wet, no dust being allowed to accumulate. The coal is all clean. Eight to twelve inches of top coal was left in advance workings. A new tipple produces 14 grades or sizes of coal, according to the demands of the market. About 48 per cent of the coal passes through the screens. The tracks had a capacity of 100 empty and 100 loaded cars. There was about 1,000 acres to be mined from the present opening. The lifetime of the mine was estimated to be about 50 years.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, p. 302.

GRAND COUNTY.

Thompson. No. 1-A Mine.

Analysis 17577 (p. 110). Bituminous coal, Book Cliffs field, from No. 1-A mine in NW. ¼ sec. 27, T. 20 S., R. 20 E., 5 miles north of Thompson, which is on the Denver & Rio Grande R. R.; connection by branch line from Thompson. Coal bed, "B" (middle bed of Bear coal); Cretaceous age, Mesaverde formation. The bed was sampled by F. R. Clark July 17, 1913, as described below:

Section of coal bed in No. 1-A Mine.

	Ft. in.
Roof, sandstone, massive.	
Shale	a 6
Coal, bright, blocky	1 3
Coal, dull, probably high in ash	1 1
Coal, bright, massive	1 0
Shale	½
Coal, bright, massive, hard	1 2
Bone, low in ash	1
Coal, bright, massive, hard	1 1
Shale, sandy	a 4
Floor, shale.	
Thickness of bed	6 6½
Thickness of coal sampled	5 8½

a Not included in sample.

The sample was taken at face of main entry, 1,200 feet east of mine opening.
The bed varies in thickness and is generally badly split by bone and shale partings.
For geologic relations of this coal see U. S. Geol. Survey Bull. 541, 1914, p. 462.
For analysis of other samples of this coal see U. S. Geol. Survey Bull, 371, p. 46.

THOMPSON. PROSPECT.

Analysis 17578 (p. 110). Bituminous coal, Book Cliffs field, from prospect being opened when sample was taken; in SE. ¼ NW. ¼ sec. 27, T. 20 S., R. 20 E., 5 miles north of Thompson, which is on the Denver & Rio Grande R. R. Coal bed, "A" (lowest bed of Bear coal); Cretaceous age, Mesaverde formation. The bed was sampled by F. R. Clark on July 17, 1913, as described below:

Section of coal bed in prospect opening.

	Ft.	in.
Roof, sandstone.		
Shale, 10 inches.		
Coal	[a]	10
Clay	[a]	5
Coal, bright, massive	4	3½
Floor, shale.		
Thickness of bed	5	6½
Thickness of coal sampled	4	3½

[a] Not included in sample.

The sample was taken 85 feet east of opening.
This bed is apparently more constant in thickness and freer from bone and shale partings than is the "B" bed in this locality.
For geologic relations of this coal see U. S. Geol. Survey Bull. 541, 1914, p. 459.

MORGAN COUNTY.

DEVILS SLIDE. HEBER ROBINSON MINE.

Analysis 19799 (p. 111). Subbituminous coal, Lost Creek field, from Heber Robinson mine, in sec. 28, T. 5 N., R. 5 E., in Toone Canyon, 12 miles northeast of Devils Slide on the Union Pacific R. R. Coal bed, not named; Tertiary age (?), formation not determined. The bed was sampled September 5, 1914, by F. R. Clark, as described below:

Section of coal bed in Heber Robinson mine.

	Ft.	in.
Roof, shale.		
Coal	1	8
Bone	[a]	2
Coal, dull and earthy		5
Coal, bright	1	2
Coal, dull		2
Coal	1	7
Coal	[a] 1	0
Floor, of workings, coal.		
Thickness of bed	6	2
Thickness of coal sampled	5	0

[a] Not included in sample.

The section was measured on the main entry, 300 feet northeast of the mine mouth. The coal was probably a little weathered.

DEVILS SLIDE. LUCAS & SMITH MINE.

Analysis 19800 (p. 111). Subbituminous coal, Lost Creek field, from Lucas & Smith mine, an abandoned slope mine in sec. 17, T. 5 N., R. 5 E., 12½ miles northeast of Devils Slide on the Union Pacific R. R. Coal bed, not named; Tertiary age (?),

formation not determined. Roof, shale and sandstone; floor, shale. The sample was cut September 5, 1914, by F. R. Clark from the rib, 200 feet west of the mine mouth, and represented 1 foot 5 inches of coal. The 26-inch bed included 5 inches of bone at the bottom, which was excluded from the sample. The mine was abandoned and the coal was slightly weathered.

SANPETE COUNTY.

WALES. COAL CREEK (JOHN REESE) MINE.

Analysis 17715 (p. 111). Bituminous coal, Book Cliff field, from Coal Creek (John Reese) mine, in NE. ¼ sec. 14, T. 16 S., R. 2 E., about 5 miles southwest of Wales; no railroad connection. Coal bed, not named; Tertiary age, Wasatch formation. The coal was sampled by F. R. Clark in September, 1913, as shown below:

Section of coal bed in Coal Creek (John Reese) mine.

	Ft.	in.
Roof, shale, calcareous.		
Coal, hard, bright and blocky		5
Coal, dull, flinty, and massive		5
Coal, bright, lustrous		2
Coal, dull, flinty and massive		8
Bone		[a] 11
Floor, shale, brown.		
Thickness of bed	2	7
Thickness of coal sampled	1	8

[a] Not included in sample.

The sample was taken from a point 300 feet N. 24° E. of the opening.

This mine was worked only during the winter months to supply coal to near by small towns and ranches.

For geologic relations of this coal see U. S. Geol. Survey Bull. 541, 1914, p. 482.

WALES. NORTH TUNNEL MINE.

Analysis 17717 (p. 111). Bituminous coal, Book Cliffs field, from North Tunnel mine, an abandoned mine in Indian Pete Canyon in NE. ¼ SE. ¼ sec. 2, T. 16 S., R. 2 E., about 3½ miles southwest of Wales. No railroad connection. Coal bed, not named; Tertiary age, Wasatch formation. The bed was sampled by F. R. Clark on September 9, 1913, as shown below:

Section of coal bed in North Tunnel mine.

	Ft.	in.
Roof, sandstone, calcareous.		
Coal	1	3
Shale	[a] 1	10
Coal		3
Shale		[a] 1½
Coal		4
Shale		[a] 1
Coal		6
Shale		[a] 6
Coal	1	1
Bone		[a] 3
Floor, shale.		
Thickness of bed	6	2½
Thickness of coal sampled	3	5

[a] Not included in sample.

The sample was taken 300 feet N. 5° E. of mine mouth. The coal may have been slightly weathered.

In the early seventies some coke was made from the coal mined in Indian Pete Canyon, and at that time there was also a railroad connecting the mines with the terminus of the Utah Central Railroad at Nephi, Utah. This early development

lasted only a short time, and exploitation on a large scale since that time has been given little serious thought.

For geologic relations of this coal see U. S. Geol. Survey Bull. 541, 1914, p. 482.

WALES. THOMAS MINE.

Analysis 17718 (p. 111). Bituminous coal, Book Cliffs field, from Thomas mine, in Old Canyon, in N. ½ NE. ¼ sec. 35, T. 15 S., R. 2 E., about 2 miles west of Wales; no railroad connection. Coal bed, not named; Tertiary age, Wasatch formation. The coal was sampled by F. R. Clark on September 9, 1913, as shown below:

Section of coal bed in Thomas mine.

	Ft.	in.
Roof, sandstone, calcareous.		
Coal	1	6
Bone		¾
Coal		5½
Bone		½
Coal	1	2½
Bone		a 8
Coal		a 2
Floor, shale, sandy.		
Thickness of bed	4	1¼
Thickness of coal sampled	3	8¼

a Excluded from sample.

The sample was taken from the face of 6 room, 1,400 feet due north of the opening. The coal was mined during the winter months only and was sold to the people of near-by settlements for domestic use.

For geologic relations of this coal see U. S. Geol. Survey Bull. 541, 1914, p. 483.

SUMMIT COUNTY.

CARTER (WYO.). PROSPECT.

Analysis 20894 (p. 111). Bituminous coal, Weber River field, from prospect in NE. ¼ sec. 8, T. 2 N., R. 18 E., 50 miles southeast of Carter, Wyo. Coal bed, not named; Carboniferous (Pennsylvanian) age, formation not determined. The sample consisted of a lump taken from the prospect on September 19, 1914, by A. R. Schultz. The coal bed is 3 feet thick and the coal is weathered.

CARTER (WYO.). LOCAL PROSPECT.

Analysis 20895 (p. 111). Bituminous coal (weathered), Weber River field, from prospect in NE. ¼ sec. 4, T. 2 N., R. 16 E., 50 miles southeast of Carter. Coal bed, not named; Carboniferous (Pennsylvanian) age, formation not determined. Roof, shale; floor not seen. The sample consisted of a lump taken from the prospect in September, 1914, by A. R. Schultz. There was 2 feet of carbonaceous shale above the coal sampled, the bed being 5 feet thick.

VIRGINIA.

BUCHANAN COUNTY.

BIG ROCK. OLIVER ELSWICK MINE.

Analysis 19735 (p. 111). Bituminous coal, Buchanan County field, from Oliver Elswick mine, a small local mine at Big Rock, 10 miles northeast of Elkhorn City, Ky., on the Carolina, Clinchfield & Ohio Ry. and the Chesapeake & Ohio R. R. Coal bed, not named; Carboniferous age, Pottsville group, Norton formation. Thickness fairly uniform; position nearly flat. Roof, shale; floor, shale. The sample was cut by T. K. Harnsberger on August 11, 1914, at the working face, 60 feet N. 70° E. of the opening, and represented 3 feet 8½ inches of coal, the thickness of the bed.

This mine furnishes coal to the immediate neighborhood and is practically idle during the summer.

BLACKEY. BLACKEY MINE.

Analyses 19833 and 19834 (p. 111). Bituminous coal, Buchanan County field, from Blackey mine, a drift mine 1 mile southeast of Blackey on the Big Sandy and Cumberland R. R. Coal bed, Mohawk; Carboniferous (Pennsylvanian) age; Pottsville group, Wise formation. Thickness fairly uniform; bed nearly flat. Roof, sandstone; floor, soft clay. The bed was sampled by T. K. Harnsberger and C. A. Davidson on September 19, 1914, as described below:

Sections of coal bed in Blackey mine.

Section	A	B
Laboratory No.	19833	19834
Roof, sandstone.		
Coal	2 ½	2 1¼
Sandstone	a 2¾	a 2½
Coal	2 9	2 8¼
Floor, soft clay.		
Thickness of bed	5 ½	5 0
Thickness of coal sampled	4 9½	4 9½

a Not included in sample.

Section A (sample 19833) was measured at face, 450 feet east of main entrance. The coal was slightly wet when sampled. Section B (sample 19834) was measured 525 feet S. 80° E. of main entrance.

The mine furnishes fuel for railroad locomotives and logging operations. In 1914 the coal in the lower bench was shot off the solid. It comes down in big blocks on account of the soft floor, and the upper bench falls of its own weight. The average daily output was 50 tons.

WHITEWOOD. WHITEWOOD MINE.

Analysis 19924 (p. 111). Semibituminous coal, Buchanan County field, from Whitewood mine, a drift mine at Whitewood on a logging railroad that connects with the Norfolk & Western Ry. at Doran, Va., 14 miles south. Coal bed not named; Carboniferous (Pennsylvanian) age, Pottsville group, Norton formation. Thickness fairly uniform; nearly flat. Roof, sandy shale; floor, shale. The bed was measured and sampled by Clayton Davidson on October 9, 1914, as described below:

Section of coal bed in Whitewood mine.

	Ft.	in.
Roof, shale.		
Coal, slightly bony at base	3	4
Shale		a 4
Coal		8
Floor, shale.		
Thickness of bed	4	4
Thickness of coal sampled	4	0

a Not included in sample.

Section was measured 600 feet southwest of main entrance.

The mine furnishes fuel for logging and lumbering operations. In 1914 the coal was shot from the solid. The average daily output was about 6 tons.

DICKENSON COUNTY.

MART. C. C. OWENS MINE.

Analyses 17751 and 17752 (p. 111). Bituminous coal, Dickenson County field, from C. C. Owens mine, a small country drift 1 mile northeast of Mart post office. Coal bed, Splash Dam; Carboniferous age, Pennsylvania series, Norton formation. Thick-

ness, about 2½ feet. Roof, shale. Thickness of partings and benches of coal, irregular. The bed was sampled by T. K. Harnsberger on September 19, 1913, as described below:

Sections of coal bed in C. C. Owens mine.

Section	A	B
Laboratory No.	17751	17752
Roof, shale.	*Ft. in.*	*Ft. in.*
Coal	8½	1 8
"Rash" and shale	¼	*a* ½
Coal	11	2
Shale	¼	*a* 1
Coal	2	3½
Shale and "sulphur"	*a* 1½	¼
Coal	7½	4
Floor, not stated.		
Thickness of bed	2 6¾	2 7¼
Thickness of coal sampled	2 5½	2 5¾

a Not included in sample.

Section A (sample 17751) was measured 10 feet north of main drift, 75 feet east of opening. Sample dry; coal slightly weathered. Section B (sample 17752) was measured 15 feet south of main entry at a point 75 feet east of opening. Sample dry; coal slightly weathered.

NORA. NORA MILLS MINE.

Analyses 17559, 17560, and 17561 (p. 112). Bituminous coal, Dickenson County field, from Nora Mills mine, a small drift mine at Nora, 10 miles north of Dante, on the Carolina, Clinchfield & Ohio R. R. Coal bed, Widow Kennedy; Carboniferous age, Pennsylvania series, Norton formation. Thickness, about 2½ feet, but varying greatly. Roof, sandstone; floor, sandy clay and sandstone. Coal badly crushed. The bed was sampled by Henry Hinds on July 12, 1913, as described below:

Sections of coal bed in Nora Mills mine.

Section	A	B
Laboratory No.	17559	17560
Roof, sandstone.	*Ft. in.*	*Ft. in.*
Coal	6⅜	5½
Bone	¼	⅛
Coal	1 3	6¼
"Rash" and shale	⅛	*a* 1½
Coal	3¾	¾
"Rash" and bone	½	5¼
Coal	2⅜	8
"Rash"	⅜	.. ..
Coal	4	.. ..
Floor, sandy clay and sandstone.		
Thickness of bed	2 8½	2 3⅝
Thickness of coal sampled	2 8½	2 1⅞

a Not included in sample.

Section A (sample 17559) was measured 100 yards east of drift mouth. Sample wet. Section B (sample 17560) was measured 100 yards northeast of drift mouth. Sample wet.

The ultimate analysis of a composite sample made by combining face samples 17559 and 17560 is given under laboratory No. 17561.

PRATER (BUCHANAN COUNTY). YELLOW POPLAR MINE.

Analyses 17743 and 17744 (p. 112). Bituminous coal, Dickenson County field, from Yellow Poplar mine, a drift mine 4 miles northwest of Prater (Buchanan County) on Slate branch of Barts Lick Creek. Coal bed, known as Upper Banner; Carboniferous

age, Pennsylvania series, Norton formation. Thickness, about 5 feet. Roof, strong sandstone; floor, sandy clay. The bed was sampled by T. K. Harnsberger on September 17, 1913, as described below:

Sections of bed in Yellow Poplar mine.

Section	A	B
Laboratory No.	17743	17744
Roof, sandstone.	*Ft. in.*	*Ft. in.*
Coal, pyritiferous	*a* 8	*a* 9½
Shale	*a* 7	*a* 6½
Coal	3	3
"Rash"	⅛	¼
Coal	9½	8⅛
Bone	*a* 1	*a* 1
Coal	1 1½	1 2⅞
Sandstone	*a* 1½	*a* 1
Coal	1 3	1 3½
Floor, sandy clay.		
Thickness of bed	4 10⅝	4 11¾
Thickness of coal sampled	3 5⅛	3 5¾

a Not included in sample.

Section A (sample 17743) was measured 200 feet east of drift mouth. Sample dry. Section B (sample 17744) was measured 220 feet N. 85° E. of drift mouth. Sample dry.

MONTGOMERY COUNTY.

Blacksburg. Clements Hollow Mine.

Analysis 19359 (p. 112). Semibituminous coal, Brushy Mountain field, from Clements Hollow mine, a drift mine 3½ miles northwest of Blacksburg on spur of the Norfolk & Western Ry. Coal bed, Small; Carboniferous (Mississippian) age, Price sandstone. Strike, N. 85° E. Roof and floor, sandy shale, grading into sandstone. The bed was sampled by R. W. Howell on May 1, 1914, as described below:

Section of coal bed in Clements Hollow mine.

	Ft. in.
Roof, shale and sandstone.	
Coal, fair	10
Coal, soft, shaly, broken	11
Shale, hard, brown	*a* 2
Coal, soft, dirty	1
Shale, flaky, coaly	*a* 4
Floor, shale and sandstone.	
Thickness of bed	2 4
Thickness of coal sampled	1 10

a Not included in sample.

The sample was gathered about 100 feet from mouth of main entry (abandoned drift). It represented weathered coal.

Blacksburg. Plunkett & Wall Mine.

Analysis 19357 (p. 112). Semibituminous coal, Brushy Mountain field, from Plunkett & Wall mine, a slope mine 4 miles northwest of Blacksburg on the Norfolk & Western Ry. Coal bed, Large; Carboniferous (Mississippian) age, Price sandstone. Roof, shale, passing into sandstone; floor, sandy shale, passing downward into sandstone. The upper and lower benches are separated by hard shale 6 inches thick. The bed was sampled by R. W. Howell on April 28, 1914, as described on page following.

Section of coal bed in Plunkett & Wall mine.

	Ft.	in.
Roof, shale.		
Coal, shaly, not mined	a1	0
Shale, not mined	a	6
Coal, not mined	a	3
Shale and coal, not mined	a	7
Coal, not mined	a	10
Shale, hard, not mined	a	6
Coal	2	2
Shale and coal	a	8
Coal	1	5
Shale and coal	a	4
Coal		3
Floor, shale.		
Thickness of bed	8	6
Thickness of coal sampled	3	10

a Not included in sample.

The sample was gathered in northeast entry, 100 feet from main slope, 300 feet from slope mouth.

Output of mine was about 7 tons a day.

Blacksburg. Seymour-Price Mine.

Analysis 19360 (p. 112). Semibituminous coal, Brushy Mountain field, from Seymour-Price mine, a slope mine 5 miles northwest of Blacksburg and the Norfolk & Western Ry. Coal bed, Large; Carboniferous (Mississippian) age, Price sandstone. This bed is the highest of the series. Roof sandy shale, passing quickly into sandstone; floor, hard sandy shale. The upper and lower benches are separated by hard blue shale 8 inches thick. The bed was sampled by R. W. Howell on April 29, 1914, as described below:

Section of coal bed in Seymour-Price mine.

	Ft.	in.
Roof, shale and sandstone.		
Coal, soft, shelly, not mined	a1	0
Shale, not mined	a	6
Coal, soft, not mined	a	3
Shale, not mined	a	5
Coal, not mined	a	6
Coal, soft, dirty, not mined	a	6
Coal, not mined	a	4
Shale, not mined	a	1
Coal, not mined	a	3
Shale, not mined	a	8
Coal	2	4
Shale	a	1
Coal		3
Shale	a	3
Coal	a	6
Shale	a	1
Coal		8
Shale	a	1
Coal, sheared		8
Floor, shale.		
Thickness of bed	9	5
Thickness of coal sampled	3	11

a Not included in sample.

The sample was gathered at a point about 350 feet down main slope, and about 150 feet northeast along bottom level.

Blacksburg. Slusser Mine.

Analyses 19358, 22629, 22630, and 22631 (pp. 112-113). Semibituminous coal, Brushy Mountain field, from Slusser mine, a drift mine 3½ miles north of Blacksburg and the Norfolk & Western Ry. Coal bed, Large; Carboniferous (Mississippian) age, Price sandstone. Thickness, 8 feet. Cover at points of sampling, 75 to 160 feet. The bed was sampled April 30, 1914, by R. W. Howell, as described on page following.

Section of coal bed in Slusser mine.

Section	A
Laboratory No	19358
Roof, sandstone.	*Ft. in.*
Coal, large blocks	[a] 1 2
Shaly coal and shale	[a] 6
Shale, yellow, hard	[a] 8
Coal, "shelly," bright	[a] 5
Shale, yellow, hard	[a] 2
Coal, crushed	[a] 6
Shale, hard, "shelly"	[a] 8
Coal, hard	2 3
Shale	[a] 3
Coal, good	2 3
Shale	[a] 3
Coal, crushed	10
Shale and bony coal	[a] 9
Coal, soft, shattered	1 6
Floor, sandstone.	
Thickness of bed	12 2
Thickness of coal sampled	6 10

[a] Not included in sample.

The sample was taken 900 feet west on main entry and 25 feet north on side entry.

The bed was also sampled May 14, 1915, by J. T. Watson and R. J. Holden in one place, as described below, three samples being taken.

Section of coal bed in Slusser mine.

Section	B
Laboratory Nos	22629, 22630, 22631
Roof, shale.	*Ft. in.*
"Draw slate"	[a] 1 6
Coal	[b] 2 4
Coal, shaly	[a] 2½
Coal, dull, brittle	[a] 5
Coal, bright	[a] 8½
Coal, dull, brittle	[a] 8½
Shale, gray, hard	[a] 3
Coal, soft	[c] 2 4
Shale, gray, hard	[a] 3
Coal, soft, crumbly	[a] 11
Coaly shale	[a] 9
Coal, soft, shiny	[d] 2 2
Floor, sandstone.	
Thickness of bed	12 6½
Thickness of coal sampled	6 10

[a] Not included in samples.
[b] Included in sample 22629.
[c] Included in sample 22630.
[d] Included in sample 22631.

This section was cut along airway, 25 feet northeast of main entry, 350 yards from drift mouth.

Christiansburg. Lyken Hill Mine.

Analysis 19403 (p. 113). Semianthracite coal, Brushy Mountain field, from Beacham mine, a slope mine 3½ miles northwest of Christiansburg and the Norfolk & Western Ry. Coal bed, Large; Carboniferous (Mississippian) age, Price sandstone. Roof of bed is hard shale, passing into sandstone; floor of bed is hard blue shale, underlaid by sandstone. The floor in the mine is shale about 1 foot 8 inches thick, underlaid by 2½ feet of shale and coal. The bed was sampled by R. W. Howell on May 7, 1914, as described on page following.

Section of coal bed in Lyken Hill mine.

	Ft.	in.
Roof, shale.		
Coal, slightly shaly		7
Coal, solid		6
Shale, hard		a 6
Coal, solid	1	3
Coal, soft ("dirt")		1½
Coal, large blocks, good		6
Shale and coal, not mined	a 1	8
Coal, hard, good, not mined	a 1	2
Dull shale, hard, not mined		a 7
Coal, not mined		a 9
Floor, shale.		
Thickness of bed	7	7½
Thickness of coal sampled	2	11½

The sample was gathered 350 feet along the main slope and east 200 feet on east entry.

The output of mine was about 35 tons a day.

PULASKI COUNTY.

DUBLIN. CLOYD MINE.

Analysis 20722 (p. 113). Semibituminous coal, Pulaski County field, from Cloyd mine, a drift mine 5½ miles north-northwest of Dublin on the Norfolk & Western Ry. Coal bed, "Upper"; Carboniferous (Mississippian) age, Price sandstone. Roof and floor, shale, passing into sandstone. Cover at point of sampling, about 30 feet. This bed was sampled by R. W. Howell on May 14, 1914, as described below:

Section of coal bed in Cloyd mine.

	Ft.	in.
Roof, shale.		
Coal, broken		6
Shale and dirty coal		a 9
Coal, sheared		10
Shale and coal		a 9
Coal		7
Shale and bone		a 4
Coal, soft, dirty		10
Coal, hard	1	6+
Floor, shale.		
Thickness of bed	6	1+
Thickness of coal sampled	4	3+

a Not included in sample.

The sample was taken 125 feet west of mine mouth.

PARROTT. PARROTT MINE.

Analysis 19431 (p. 113). Semibituminous coal, Pulaski County field, from Parrott mine, a shaft mine at Parrott, on Bluefield division of the Norfolk & Western Ry. Coal bed, Large; Carboniferous (Mississippian age), Price sandstone. Thickness, 7 feet. Roof and floor, shale. The bed was sampled by R. W. Howell on April 25, 1914, as described on page following.

Section of coal bed in Parrott mine.

	Ft.	in.
Roof, shale.		
Coal, soft		2
Shale		a 2
Coal		9
Shale		a 3
Coal		3
Shale		a 1
Coal, soft, dirty		7
Shale		a 1
Coal		2
Shale		a 1
Coal		4
Shale		a 6
Coal	1	4
Coal and shale		a 5
Coal (includes 1 inch of shale)	1	10
Floor, shale.		
Thickness of bed	7	0
Thickness of coal sampled	5	5

a Not included in sample.

The sample was cut in west entry, 100 feet west of shaft landing.

RUSSELL COUNTY.

DANTE. NO. 2 MINE.

Analyses 18128, 18129, 18130, and 18131 (p. 113). Bituminous coking coal, Russell County field, from No. 2 mine, a drift mine 2 miles northeast of Dante, on the Carolina, Clinchfield & Ohio Ry. Coal bed, Upper Banner; Carboniferous age, Pennsylvania series, Norton formation. Thickness, about 5 feet. Roof, sandstone and shale; floor, hard clay. Cover at point of sampling, over 500 feet. The bed was sampled by T. K. Harnsberger on November 18, 1913, as described below:

Sections of bed in No. 2 mine.

Section	A		B		C	
Laboratory No.	18128		18129		18130	
	Ft.	in.	Ft.	in.	Ft.	in.
Roof, sandstone.						
Coal	1	10	1	4	1	6
Sandstone		a 1½		a 1		a 1
Coal	1	2½	1	2	1	5
Sandstone, fine		a ½		a 1		a 1
Coal	2	5	1	6	1	10
Floor, shale.						
Thickness of bed	5	7½	4	2	4	11
Thickness of coal sampled	5	5½	4	0	4	9

a Not included in sample.

Section A (sample 18128) was measured 2,400 feet S. 18° E. of 3 entrance, drift on McClure. Section B (sample 18129) was measured 2,750 feet S. 78° E. of 5 drift entrance. Section C (sample 18130) was measured 3,400 feet S. 85° W. of 1 drift entrance on middle McClure.

The ultimate analysis of a composite sample made by combining samples 18128, 18129, and 18130 is given under laboratory No. 18131.

DANTE. NO. 52 MINE.

Analyses 18122, 18123, and 18124 (p. 113). Bituminous coking coal, Russell County field, from No. 52 mine, 1 mile east of Dante, on the Carolina, Clinchfield & Ohio Ry. Coal bed; Lower Banner; Carboniferous age, Pennsylvanian series, Norton formation. Thickness, 2½ to 3 feet. Roof, sandy shale; floor, shale. Cover at points of sampling, 400 to 450 feet. The bed was sampled by T. K. Harnsberger on November 17, 1913, as described on page following.

Sections of coal bed in No. 52 mine.

Section	A	B
Laboratory No	18122	18123
Roof, sandy shale.		
Coal	Ft. 3 in. 0	Ft. 2 in. 6½
Coal and shale	-- --	a 2
Floor, shale.		
Thickness of bed	3 0	2 8½
Thickness of coal sampled	3 0	2 6½

Section A (sample 18122) was measured 325 feet northeast of entrance to No. 0 drift. Section B (sample 18123) was measured 1,700 feet southwest of entrance to No. 1 drift.

The ultimate analysis of a composite sample made by combining face samples 18122 and 18123 is given under laboratory No. 18124.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, p. 68.

Dante. No. 103 Mine.

Analysis 18121 (p. 113). Bituminous coal, Russell County field, from Dante No. 103 mine, a prospect drift 1 mile northwest of Dante, on the Carolina, Clinchfield & Ohio Ry. Coal bed, Kennedy; Carboniferous age, Pennsylvanian series, Norton formation. Thickness, irregular, varying from 8 inches to 8 feet near point of sampling. Roof, sandstone; floor, hard clay. Cover at point of sampling, about 150 feet. The sample was cut by T. K. Harnsberger on November 17, 1913, 260 feet N. 55° W. of drift mouth, and represented 5 feet 2 inches of coal. There was 8 inches of coal, shale, and sandstone above the part sampled.

For geologic relations of this coal see U. S. Geol. Survey Bull. 316, 1907, p. 68.

Della. Flat Rock Mine.

Analyses 25367, 25368, and 25369 (p. 113). Bituminous coal, Russell County field, from Flat Rock mine, a drift mine 3 miles north of Della, near the main forks of Lewis Creek on railroad of the Honaker Lumber Co. Coal bed, Kennedy; Carboniferous age, Pennsylvanian series, Norton formation. Thickness, 15 to 58 inches; average, about 32 inches. Roof, firm shale overlain by sandstone cap rock; floor thin, hard clay, underlain by sandstone. The bed was sampled by T. K. Harnsberger on June 7, 1916.

Sample 25367 was cut at face of 1 left entry, 750 feet N. 30° E. of main drift mouth, and represented 2 feet 10 inches of coal. The coal contained a ¼-inch shale parting, which was included in the sample. Sample 25368 was cut at face of 2 right entry, 900 feet S. 75° E. of main drift mouth, and represented 2 feet 9 inches of coal, the thickness of the bed.

The ultimate analysis of a composite sample made by mixing face samples 25367 and 25368 is shown under laboratory No. 25369.

Della. Jackson Mine.

Analysis 22346 (p. 113). Bituminous coal, Russell County field, from Jackson mine, a local drift mine one-half mile south of Della and 3 miles northeast of Honaker, a station on the Norfolk & Western Ry. Coal bed, not named; Carboniferous (Pennsylvanian) age, Pottsville group, Norton formation. Thickness, variable; ranges from 3 to 11 feet, average about 4 feet. Dip, irregular. Roof and floor, hard clay. The bed was sampled by T. K. Harnsberger on May 26, 1915, as described on page following.

Section of coal bed in Jackson mine.

	Ft.	in.
Roof, clay.		
Coal	1	0
"Rash"		1/8
Coal	1	9 1/2
Clay		a 1/2
Coal		7
Floor, clay.		
Thickness of bed	3	5 1/2
Thickness of coal sampled	3	4 5/8

a Not included in sample.

The section was measured in 600 feet northwest of opening.

In 1915 the coal was shot from the solid.

Drill. Drill Mine.

Analysis 19484 (p. 113). Bituminous coal, Russell County field, from Drill mine, a drift mine at Drill, on Honaker Lumber Co. R. R. Coal bed, Kennedy; Carboniferous (Pennsylvanian) age, Pennsylvanian series, Pottsville group. Thickness, 4 feet. Roof, shale; floor, sandstone. Cover at point of sampling, 150 feet. The sample was taken 150 yards northeast of the mine opening on June 5, 1914, by C. M. Bauer and represented 4 feet of coal. No impurities were excluded from sample. Daily output, 25 tons.

Drill. Sandy Ridge Mine.

Analyses 22345 and 19528 (p. 113). Bituminous coal, Russell County field, from Sandy Ridge mine, a drift mine on the Honaker Lumber Co. R. R., 1 mile south of Drill. Coal bed, Kennedy; Carboniferous age, Pennsylvanian series, Norton formation. Thickness, variable. Roof, shale; floor, hard clay.

The bed was sampled by C. M. Bauer on June 15, 1914. The sample (No. 19528) was taken 150 feet north of mouth of southernmost drift, in a room 20 feet to the right of the entry and represented 2 feet 10 inches of coal. There was 2 inches of carbonaceous shale above the part sampled.

The bed was also measured and sampled by T. K. Harnsberger on May 25, 1915. The sample (No. 22345) represented 2 feet 9 inches of coal and was taken 170 feet S. 70°W. of entrance to north drift.

In 1915 the coal was shot from the solid. Daily output, 20 tons.

Slemp. No. 201 Mine.

Analyses 18239, 18240, 18241, and 18242 (p. 114). Bituminous coal, Russell County field, from No. 201 mine, a shaft mine 1 mile northeast of Slemp post office, Hurricane station, on the Carolina, Clinchfield & Ohio Ry. Coal bed, No. 4; Carboniferous age, Pennsylvanian series, Norton formation. Thickness, 3 to 6 feet. Roof, sandstone and shale; floor, hard clay. Cover at points of sampling, 600 to 900 feet. The bed was sampled by T. K. Harnsberger on November 26, 1913, as described below:

Sections of coal bed in No. 201 mine.

Section	A		B		C	
Laboratory No.	18239		18240		18241	
	Ft.	in.	Ft.	in.	Ft.	in.
Roof, sandstone and shale.						
"Rash"		a 9	--	--	--	--
Coal	2	0	1	9 1/2	1	4 1/2
Sandstone and shale		a 3		a 5		a 3 1/2
Coal	3	1	2	3	2	3
Floor, hard clay.						
Thickness of bed	6	1	4	5 1/2	3	11
Thickness of coal sampled	5	1	4	1/2	3	7 1/2

a Not included in sample.

Section A (sample 18239) was gathered 5,200 feet N. 33° W. of shaft. Section B (sample 18240) was gathered 1,600 feet N. 68° W. of shaft. Section C (sample 18241) was gathered 2,900 feet N. 27° W. of shaft.

The ultimate analysis of a composite sample, made by combining face samples 18239, 18240, and 18241 is given under laboratory No. 18242.

WILDER. NO. 6 MINE.

Analyses 18235 to 18238 (p. 114). Bituminous coal, Russell County field, from No. 6 mine, a drift mine at Wilder, on the Carolina, Clinchfield & Ohio Ry. Coal bed, Upper Banner; Carboniferous age, Pennsylvanian series, Norton formation. Thickness, 6 to 8 feet; average 6½ feet. Roof, sandstone and shale; floor, hard clay. Cover at points of sampling, 100 to 600 feet. The bed was sampled by T. K. Harnsberger on November 25, 1913, as described below:

Sections of coal bed in No. 6 mine.

Section	A	B	C
Laboratory No.	18235	18236	18237
Roof, sandstone and shale.			
Coal	Ft. 1 in. 6	Ft. 1 in. 2	Ft. 1 in. 7
Sandstone	a 1	a 1	a 1
Coal	1 6¾	1 6½	1 8½
Shale	a 1	.. ..	a 1
Coal, shale, and "rash"	.. ..	a 4½	a 4½
Coal	2 2	4½	1 11
Shale	a 3½	a ½	.. ..
"Rash" and clay	.. ..	.. ..	a 6
Coal	1 1½	1 5	1 5
Coal and shale	.. ..	a 6	.. ..
Coal	.. ..	8½	.. ..
Floor, shale.			
Thickness of bed	6 9½	6 1¾	7 8
Thickness of coal sampled	6 4½	5 2½	6 7½

a Not included in sample.

Section A (sample 18235) was cut 3,000 feet S. 71° W. of No. 1 opening. Section B (sample 18236) was cut in 5 room, 1,250 feet S. 35° W. of No. 3 opening. Section C (sample 18237) was cut 4,000 feet S. 10° W. of No. 3 opening.

The ultimate analysis of a composite sample made by combining face samples 18235, 18236, and 18237 is given under laboratory No. 18238.

WILDER. NO. 55 MINE.

Analyses 18243 to 18246 (p. 114). Bituminous coal, Russell County field, from No. 55 mine, a drift mine at Wilder, on the Carolina, Clinchfield & Ohio Ry. Coal bed, Lower Banner; Carboniferous age, Pennsylvanian series, Norton formation. Thickness averages 3½ feet. Roof, shale, with 4 inches of "draw slate" above coal; floor, shale. Cover at points of sampling, 400 to 650 feet. The bed was sampled by T. K. Harnsberger on November 25, 1913, as described below:

Sections of coal bed in No. 55 mine.

Section	A	B	C
Laboratory No.	18243	18244	18245
Roof, shale.			
Coal	Ft. 3 in. 4	Ft. 7	Ft. .. in. ..
"Rash"	a 3½	a 2	a ½
Sandstone	.. ..	a 1 9	.. ..
Coal	.. ..	3 5	3 6
"Rash"	.. ..	a 7	a 4
Floor, shale.			
Thickness of bed	3 7½	6 6	3 10½
Thickness of coal sampled	3 4	4 0	3 6

a Not included in sample.

Section A (sample 18243) was gathered in 3 main entry, 900 feet S. 60° W. of No. 3 drift mouth. Section B (sample 18244) was gathered 2,500 feet S. 35° E. of No. 5 main drift mouth. Section C (sample 18245) was gathered 1,300 feet N. 35° W. of No. 2 drift mouth.

The ultimate analysis of a composite sample made by combining face samples 18243, 18244, and 18245 is given under laboratory No. 18246.

WISE COUNTY.

PARDEE. PARDEE (No. 1) MINE.

Analyses 22277 to 22280 (p. 114). Bituminous coal, Black Mountain field, from Pardee No. 1 mine, a drift mine 1 mile northwest of Pardee, on the Roaring Fork R. R. Coal bed, Pardee (Limestone or Parsons); Carboniferous (Pennsylvanian) age, Pottsville group. Thickness, uniform; gentle northwest dip. Roof, shale; floor, shale. The bed was sampled by T. K. Harnsberger on May 22, 1915, as shown below:

Sections of coal bed in Pardee (No. 1) mine.

Section	A	B	C
Laboratory No.	22277	22278	22279
Roof, shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	[a] 4	[a] 4	[a] 4
Shale	[a] 2	[a] 2	[a] 2
Coal [b]	[a] 11	[a] 11	[a] 11
Coal	7 10	7 8	7 3
Floor, shale.			
Thickness of bed	9 3	9 1	8 8
Thickness of coal sampled	7 10	7 8	7 3

[a] Not included in sample. [b] Coal left in roof.

Sample 22277 was cut in 2 right entry, main three-face entry, 2,500 feet N. 15° W. of mine mouth. Sample 22278 was cut from face of main three-face entry, 2,000 feet north of mine mouth. Sample 22279 was cut in 6 left entry, main entry, 2,500 feet northwest of mine mouth. In each instance there was coal, left up for roof, above the part sampled.

The ultimate analysis of a composite sample made by mixing face samples 22277 22278, and 22279 is shown under laboratory No. 22280.

The mine is exceptionally dry and both roof and floor are good. A small part of the top of the bed, which separates readily from the lower part, is left up for roof. It will be saved, as far as possible, when the mine is robbed. In 1915 all the coal was brought to the surface through one main haulway. Another main entry had been started on the opposite side of the valley, which when developed, will greatly increase the capacity of the mine.

For analyses and descriptions of other samples of coal from this mine see Bureau of Mines Bull. 85, 1914, pp. 107, 336.

For geologic relations of this coal see U. S. Geol. Survey Bull. 541, 1914, p. 204.

TOMS CREEK. CRANESNEST NO. 1 MINE.

Analyses 18226, 18227, 18228, and 18229 (p. 115). Bituminous coal, Black Mountain field, from Cranesnest No. 1 mine, a drift mine 1½ miles northwest of Toms Creek, on the Virginian Ry. and the Norfolk & Western Ry. Coal bed, Upper Banner; Carboniferous age, Pennsylvanian series, Norton formation. Thickness, about 6 feet. Roof, hard shale; floor, hard clay. Cover at points of sampling, 100 to 500 feet. The bed was sampled by T. K. Harnsberger on November 22, 1913, as described on page following.

Sections of coal bed in Cranesnest No 1 mine.

Section	A	B	C
Laboratory No.	18226	18227	18228
Roof, shale.			
Coal	Ft. in. 1½	Ft. in. 1 10	Ft. in. .. ..
Sandstone	[a] ½	[a] 1	.. ..
Coal	2 0	2 2	2 10
Sandstone	[a] 1	.. ..	[a] 1
Coal	1 7½	.. ..	1 5¾
Coal and shale	[a] 2½	.. ..	.. ..
Shale	.. ..	.. ..	¼
Coal	3½	.. ..	3
Shale	[a] 4	.. ..	[a] 5
Coal	2	.. ..	6
Shale	1¾	.. ..	⅛
Coal	10	.. ..	9½
Floor, shale.			
Thickness of bed	5 10½	4 1	6 4⅝
Thickness of coal sampled	5 ½	4 0	5 10⅛

[a] Not included in sample.

Section A (sample 18226) was measured 1,500 feet southwest of entrance to main entry, on Caney Creek. Section B (sample 18227) was measured 500 feet northeast of mouth of main opening, on Caney Creek. Section C (sample 18228) was measured 4,100 feet southeast of mouth of main opening, on Caney Creek.

The ultimate analysis of a composite sample made by combining samples 18226, 18227, and 18228 is given under laboratory No. 18229.

WYTHE COUNTY.

Max Meadows. Ellison & Johnson Prospect.

Analysis 20721 (p. 115). Semibituminous coal, Brushy Mountain field, from Ellison & Johnson prospect pit, 3 miles north of Max Meadows on the Norfolk & Western Ry. Coal bed, Upper or Large; Carboniferous (Mississippian) age, Price sandstone. Roof, sandstone; floor, shale. Depth from surface to point of sampling, 6 feet. The sample was taken in the pit at a point about 10 feet from the opening by R. W. Howell on May 15, 1914. The sample represented about 6 feet 8 inches of coal, the entire thickness of the bed. The coal was weathered, crushed, soft, and dirty.

WASHINGTON.

KING COUNTY.

Ravensdale. No. 1 Mine.[a]

Analysis 23495 (p. 115). Bituminous coal, from Ravensdale No. 1 mine, a slope mine in NE. ¼ sec. 36, T. 22 N., R. 6 E., at Ravensdale, on the Northern Pacific Ry. Coal beds, Nos. 3, 4, 5, and 9; Tertiary (Eocene) age, Puget formation. All the beds dip about 25° to 45° W. Strike, north and south. Faults are numerous. In the mine a fault striking north and south cuts the beds. Beds 3 and 4 are separated by about 10 feet of carbonaceous shale and impure coal. No. 3 bed is about 3 feet thick. Thickness of Nos. 4 and 5 beds not stated. No. 9 bed is 4½ feet thick. The No. 3 bed was sampled November 23, 1915, by Edwin Higgins, as described below:

Section of coal bed in No. 1 mine.

	Ft. in.
Roof, shaly limestone (hanging wall).	
Coal, shaly	[b] 5½
Bony coal and shale	[b] 1
Lignitic to semibituminous coal	2 4
Floor, hard carbonaceous shale.	
Thickness of bed	2 10½
Thickness of coal sampled	2 4

[a] For description of coal beds worked in this mine see U. S. Geol. Survey Bull. 474, 1911, p. 94, and Bull. 3, Washington Geol. Survey, 1912.
[b] Not included in sample.

The sample was measured 10 feet west of 37 chute, main entry, 3 east level.

The mine was worked by what is known locally as the chute and pillar system. The coal was shot down with permissible explosives, the blasting being done by shot firers at 9 a. m., noon, and 3 p. m. The average daily output during the winter months was between 500 and 600 tons.

No. 9 bed is tapped by a rock tunnel. The main slope is in No. 5 bed; the workings in No. 3 and No. 4 beds are connected with No. 5 by rock tunnels.

WHATCOM COUNTY.

GLACIER. DISCOVERY TUNNEL.

Analyses 19722 and 19723 (p. 115). Anthracite, Glacier field, from Discovery tunnel, a prospect entry in SE. ¼ sec. 29, T. 39 N., R. 7 E., 4 miles south of Glacier, the terminus of the Bellingham & Northern R. R., a branch of the Chicago, Milwaukee & St. Paul Ry., and about 3,500 feet higher than the station at Glacier. Coal bed not named, is lowest coal bed of the Puget group; Tertiary (Eocene) age. Dips NW. 68°. Roof and floor, not stated. It was sampled July 31, 1914, by M. R. Campbell, as described below:

Sections of coal bed in Discovery tunnel.

Section	A		B	
Laboratory No.	19722		19723	
Roof, not stated.	*Ft.*	*in.*	*Ft.*	*in.*
Coal	2	5	..	..
Coal, impure, laminated	..	..	[a]1	6
Coal, soft, laminated	[a]4		..	..
Shale, carbonaceous	[a]1	6	..	..
Coal, hard	5	10	14	5
Coal, impure, laminated	..	..	[a]2	1
Floor, not stated.				
Thickness of bed	10	1	18	0
Thickness of coal sampled	8	3	15	5

[a] Not included in sample.

Section A (sample 19722) was cut from face of entry, 750 feet from mouth; sample slightly damp. Section B (sample 19723) was cut in entry, 300 feet from mouth; coal slightly weathered and covered with some dirt.

A new mine was being opened at this place.

For geologic relations of this coal see U. S. Geol. Survey Bull. 541, 1914, p. 397.

GLACIER. SMITH TUNNEL MINE.

Analysis 19724 (p. 115). Anthracite, Glacier field, from Smith tunnel, a prospect entry in SE. ¼ sec. 30, T. 39 N., R. 7 E., 4 miles south of Glacier, the terminus of the Bellingham & Northern R. R., a branch of the Chicago, Milwaukee & St. Paul Ry. Coal bed same as that at Discovery tunnel, is lowest coal bed in Puget group; Tertiary (Eocene) age. Dips NE. about 30°. The bed was sampled August 1, 1914, by M. R. Campbell. The sample was cut in prospect entry about 200 feet from the mouth, but not beyond the zone of weathering. The bed was 8 feet thick at the point of sampling. The upper 5 feet 6 inches was partly hard and partly soft. The lower 2 feet 6 inches, very soft anthracite, was excluded from the sample. Some of the coal from this lower soft bench was dried and examined outside the prospect. It was found to be composed almost wholly of fragments of bright shiny anthracite that appeared to be soft merely because it was so finely disintegrated.

For geologic relations of this coal see U. S. Geol. Survey Bull. 541, 1914, p. 398.

GLACIER. PROSPECT.

Analysis 19725 (p. 115). Semianthracite (?) coal, Glacier field, from prospect entry in SE. ¼ sec. 24, T. 39 N., R. 6 E., about 3 miles southwest of Glacier, the terminus of the Bellingham & Northern R. R., a branch of the Chicago, Milwaukee & St. Paul Ry. Coal bed same as at Discovery tunnel, is lowest bed in Puget group; Tertiary (Eocene) age. Dips about 51° NE. The bed was sampled August 2, 1914, by M. R. Campbell, as described below:

Section of coal bed in prospect entry 4 miles southwest of Glacier.

	Ft.	in.
Coal	5	9
Bone	[a]	11
Anthracite, soft, laminated, base not exposed	[a] 2	7+
Thickness measured	9	3+
Thickness of coal sampled	5	9

[a] Not included in sample.

The sample was taken at face of entry, 20 feet from mouth. Coal weathered. For geologic relations of this coal see U. S. Geol. Survey Bull. 541, 1914, p. 389.

GLACIER. PROSPECT.

Analysis 19726 (p. 115). Semianthracite (?) coal, Glacier field, from prospect pit in SW. ¼ sec. 24, T. 39 N., R. 6 E., 3 miles southwest of Glacier, the terminus of the Bellingham & Northern R. R., a branch of the Chicago, Milwaukee & St. Paul Ry. Coal bed same as that at Discovery tunnel, is lowest bed in Puget group; Tertiary (Eocene) age. Bed dips 30° to 40° N. Sample was cut from exposure in the side of a prospect pit about 4 feet deep, situated on the narrow summit of a ridge about 1,000 feet high. The coal was badly weathered and so crushed that it was impossible to determine what part of the bed was included in the sample. Sample included about 3 feet of coal.

For geologic relations of this coal see U. S. Geol. Survey Bull. 541, 1914, p. 389.

WEST VIRGINIA.

CLAY COUNTY.

WIDEN. RICH RUN MINE.

Analyses 21816 to 21818, 21892, and 23587 to 23594 (pp. 115–116). Bituminous coal, Elk River field, from Rich Run mine, a drift mine near the headwaters of Buffalo Creek, at Widen, on the main line of the Buffalo Creek & Gauley R. R., a branch of the Coal & Coke Ry. Coal bed, No. 5 or Block: Carboniferous (Pennsylvanian) age, Allegheny formation. The coal outcrops 200 feet above the bed of Buffalo Creek and about 200 feet from the top of the hills. The bed in places is cut out by rolls of sandstone roof, locally known as faults. Thickness, 5½ feet to 6 feet 2 inches, averaging 6 feet. Immediate roof is 6 inches of "draw slate," overlain by 12 to 18 inches of gas coal; the main roof consists of medium fine-grained sandstone. Floor is hard shale 8 to 12 inches thick, underlain by 18 inches of gas coal. Neither the bottom nor top coal is taken in mining This seam is multiple bedded, consisting of gas and hard gray splint coals. There is a characteristic 6-inch hard-shale parting which easily separates from the coal. The lower part of the coal consists of very hard, gray, splint coal that will withstand handling with little abrasive effect, and would only with difficulty be converted into dust. The gas and splint coals are not separated in mining and shipment.

The bed was sampled by E. R. Lloyd on April 9, 1915, as described below:

Sections of coal bed in Rich Run mine.

Section	A	A	B
Laboratory No.	21816	21892	21817
Roof: shale in A, sandstone in B.	Ft. in.	Ft. in.	Ft. in.
Coal	11	11	6½
Mineral charcoal	.. ..	.. ..	½
Coal	.. ..	.. ..	5½
Shale	a 6	a 6	a 5
Coal	4 4	4 a 4	3 7½
Shale	.. ..	.. ..	a 1½
Coal	.. ..	.. ..	9
Floor, clay.			
Thickness of bed	5 9	5 9	5 11½
Thickness of coal sampled	5 3	11	5 5

a Not included in sample.

Section A (sample 21816) was measured at the face of 1 east entry, 5½ entry, 2,000 feet S. 60° E. of mine mouth and about 800 feet from the nearest outcrop. Sample 21892 represented only the upper bench of 11 inches. Section B (sample 21817) was measured in 15 room, 2 right entry, 5½ south entry, 1,200 feet southwest of mine mouth and about 150 feet from nearest outcrop.

The ultimate analysis of a composite sample made by mixing samples 21816 and 21817 is given under laboratory No. 21818.

The bed was also sampled by D. J. Parker, H. D. Jones, and G. W. Grove on December 15 and 16, 1915, as described below:

Sections of coal bed in Rich Run mine.

Section	A	B	C	D	E	F	G
Laboratory No.	23593	23591	23592	23590	23587	23588	23589
Roof, "draw slate."	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal, gas	1 1½	1 2	1 2	1 2	1 1	1 3	1 3½
Shale, hard	a 6	a 5	a 6	a 6	a 7	a 6	a 6
Coal, gray splint	5 0	5 1	4 8	3 5	3 4	1 10	1 10
Bone	.. ..	.. ..	.. ..	a 3	a 2	a 2	a 2
Coal, gray splint	.. ..	.. ..	.. ..	1 3	1 1	1 3	1 5
Shale	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3
Coal, gray splint	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	a 1 0
Floor, hard shale.							
Thickness of bed	6 7¼	6 8	6 4	6 7	6 3	5 0	6 5½
Thickness of coal sampled	6 1¼	6 3	5 10	5 10	5 6	4 4	5 6½

a Not included in sample.

Section A (sample 23593) was cut from 12 pillar, 1 straight heading, 900 feet S. 86° E. of pit mouth. Section B (sample 23591) was cut from face of 3 room, 3 south heading, 1,600 feet S. 45° E. of pit mouth. Section C (sample 23592) was cut from face of 8 room, 2 east heading, 1,900 feet S. 30° E. of pit mouth. Section D (sample 23590) was cut from face of 6 room, 4 east heading, 2,300 feet S. 20° E. of pit mouth. Section E (sample 23587) was cut from face of 5 room, 3 right heading, 1,600 feet south of pit mouth. Section F (sample 23588) was cut from face of 31 room, 6 south heading, 2,500 feet N. 86° W. of pit mouth. Section G (sample 23589) was cut from face of 6 room, 1 left entry, 2 right heading, 2,500 feet west of pit mouth.

The ultimate analysis of a composite sample made by combining face sample 23587 to 23593 is given under laboratory No. 23594.

The coal is mined by the room-and-pillar system. In 1915 it was undercut with short-wall machines, and shot down with black powder fired by squibs. The tipple was of wood, designed to handle 2,000 tons of coal per day, equipped with double shaking screens, one loading boom, and three picking tables. The following grades of coal were made: Lump, egg, nut, and slack. Twelve pickers were required. The

coal was picked on both the screens and the railroad cars. The output was about 1,500 tons a day. There was about 8,000 acres unmined, and the lifetime of the mine was estimated to be about 100 years.

FAYETTE COUNTY.

Boomer. No. 2 North Mine.

Analyses 23487, 23488, and 23489 (p. 116). Bituminous coal, Kanawha field, from No. 2 North mine, a drift mine 1½ miles east of Boomer, on a branch line of the Kanawha & Michigan R. R. Coal bed, Eagle; correlated to the Kanawha group of carboniferous (Pottsville) age. It lies 60 to 160 feet under the Powelton coal, and 115 to 230 feet under the No. 2 gas coal. Thickness, 5 to 6 feet. The seam outcrops on either side of and approximately 50 feet above the bed of Boomer Creek. Cover, 700 to 1,000 feet. Dip is slight. The coal is of the "gas" type, and has the columnar structure of typical coking coal, without any splinty layers. Its physical character much resembles the Pottsville coals of New River, and it makes excellent coke and steam coal. Main roof is sandstone and shale; immediate roof is dark, brittle shale. Floor is rather hard, smooth clay, which does not become mixed with the coal in mining. The bed was sampled December 3, 1915, by H. D. Jones and J. W. Grove, as described below:

Sections of coal bed in No. 2 North mine.

Section	A	B
Laboratory No.	23487	23488
Roof, "draw slate."		
Coal	Ft. 1 in. 9	Ft. 2 in. 4
Shale		[a]7
Coal	8½	[a]5½
Shale	[a]5	.. ..
Clay	.. ..	[a]1
Coal	[a]3	1½
Shale	[a]½	.. ..
Coal	[a]1¾	.. ..
Clay	[a]½	.. ..
Coal	1	1½
Coal (splint)	3	3
Coal	1 9	1 8
Floor, clay.		
Thickness of bed	5 5½	5 7½
Thickness of coal sampled	4 7	4 6

[a] Not included in sample.

Section A (sample 23487) was gathered at a point 10,800 feet northeast of pit mouth. Section B (sample 23488) was gathered at a point 11,000 feet N. 35° W. of pit mouth.

The ultimate analysis of a composite sample made by combining samples 23487 and 23488 is given under laboratory No. 23489.

In 1915 the coal was cut by hand or electric chain machines, near the top of the bed when cut with picks and at the bottom if by machine, and was shot down by black powder. The daily production was 2,000 tons.

Layland. Layland No. 3 Mine.

Analyses 21502 to 21507 (p. 117). Semibituminous coal, New River field, from Layland No. 3 mine, a drift mine 2 miles north of Layland station, on the Chesapeake & Ohio R. R. and 8 miles from Quinnemont. Coal bed known as Fire Creek; Carboniferous (Pottsville) age, Quinnemont formation. Thickness, 3 to 4½ feet. Roof, generally a hard, gray shale, rather variable, and containing numerous slips; floor smooth, hard underclay. Cover, about 200 feet. The bed was sampled by D. J. Parker, H. D. Jones, and R. H. Seip on March 19, 1915, as described on page following.

Sections of coal bed in Layland No. 3 mine.

Section	A	B	C	D	E
Laboratory No	21502	21503	21504	21505	21506
Roof, hard gray shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal	2 9½	.. ..	4 0	4½	3 10
Bone	a¾	a2	.. ..	a1	.. ..
Coal	10	3 10	.. ..	3 1	.. ..
Floor, hard underclay.					
Thickness of bed	2 8¼	4 0	4 0	3 6½	3 10
Thickness of coal sampled	2 7½	3 10	4 0	3 5½	3 10

a Not included in sample.

Section A (sample 21502) was cut on left rib, 3 left entry, tunnel entry, just inby last break-through. Section B (sample 21503) was cut on left rib of tunnel entry, 6 feet from face. Section C (sample 21504) was cut at a point 6 feet from face of 6 left entry, No. 4 mine, on inby corner of last break-through. Section D (sample 21505) was cut at a point 50 feet from face of main heading, at inby corner of last break-through. Section E (sample 21506) was cut at a point 75 feet from face of 10 left entry, on left rib.

The ultimate analysis of a composite sample made by combining face samples 21502, 21503, 21504, 21505, and 21506 is given under laboratory No. 21507.

In 1915 main triple entries had been driven to the rise on the strike of the bed at a bearing of N. 80° E. and had been advanced a distance of 7,300 feet. Twelve pairs of double butt entries were driven off at intervals of 500 feet to the left at right angles from the main entries. At 700 feet from drift mouth the so-called "tunnel" entries were driven off to the left of the main entries. The coal was all mined by pick, being "overcut" in the top coal and then blasted down with black blasting powder by the miners during the shift. The daily output from the No. 3 mine was about 750 tons. There were also two other mines in practically the same operation, Layland Nos. 1 and 2. (See analyses Nos. 8346, 8234, 8350, Bureau of Mines Bull. 22, pp. 227, 228.)

For descriptions and analyses of other samples of coal from this mine, see Bureau of Mines Bull. 22, 1913, pp. 919–920.

Longacre. Sunday Creek No. 114 Mine.

Analyses 23986, 23987, 23988, 23989, 23990, 23991, and 23992 (p. 117). Bituminous coal, Kanawha field, from Sunday Creek No. 114 mine, a drift mine one-fourth mile southeast of Longacre, on the Kanawha & Michigan R. R. Coal bed, No. 2 or Gas; Carboniferous (Pottsville) age, Kanawha group. Thickness, 4½ to 5 feet. Roof and floor, shale. Cover at point of sampling, 1,000 to 1,150 feet. The bed was sampled by D. J. Parker and H. D. Jones on January 20, 1916, as described below:

Sections of coal bed in Sunday Creek No. 114 mine.

Section	A	B	C	D	E	F
Laboratory No	23986	23987	23988	23989	23990	23991
Roof, shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal, gas	4	3	4	4	2	4
Coal, splint	1 6	1 6	1 5	1 3	1 10	1 5½
Shale	.. ..	.. ..	.. ..	.. ..	.. ..	a½
Coal, gas	3 2	3 1	2 9	3 6	2 10	3 0
Floor, shale.						
Thickness of bed	5 0	4 10½	4 6	5 1	4 10	4 10
Thickness of coal sampled	5 0	4 10½	4 6	5 1	4 10	4 9½

a Not included in sample.

Section A (sample 23986) was measured at face of 6 room, 10 east entry, 13 south heading, 11,700 feet N. 85° E. from pit mouth. Section B (sample 23987) was measured at face of 1 room, 6 east entry, 13 south heading, 11,450 feet N. 76° E. from pit

mouth. Section C (sample 23988) was measured at face of main east heading, 11,650 feet N. 75° E. from pit mouth. Section D (sample 23989) was measured at face of 3 room, 3 east entry, 13 north heading, 11,600 feet east from pit mouth. Section E (sample 23990) was measured at face of 1 room, 8 east entry, 13 south heading, 11,500 feet N. 80° E. from pit mouth. Section F (sample 23991) was measured at face of 13 north heading, 11,650 feet N. 73° E. from pit mouth.

The ultimate analysis of a composite sample made by combining face samples 23986, 23987, 23988, 23989, 23990, and 23991 is given under laboratory No. 23992.

In 1916 the coal was mined by the room-and-pillar system. The coal was undercut with machines and shot down with black blasting powder. The daily output was about 1,200 tons.

MARTING. NO. 1 MINE.

Analyses 24055, 24056, 24057, 24058, 24059, 24060, and 24061 (p. 117). Bituminous coal, Kanawha field, from No. 1 mine, a drift mine at Marting, on the Kanawha & Michigan R. R. Coal bed, No. 2 or Gas; Carboniferous (Pottsville) age, Kanawha group. Thickness, 5 to 7 feet. Roof, "draw slate"; floor, hard shale. Cover at points of sampling, 1,000 to 1,100 feet. The bed was sampled by D. J. Parker and H. D. Jones on January 28, 1916, as described below:

Sections of coal bed in No. 1 mine.

Section	A	B	C	D	E	F
Laboratory No.	24055	24056	24057	24058	24059	24060
Roof, "draw slate."	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal, splint	2 5	2 3	2 2	2 5	2 0	2 5
Shale, soft	[a] 1 3	[a] 1 2	[a] 1 1	[a] 1 4	.. ..	[a] 8½
Bone	.. ..	.. ..	.. ..	.. ..	[a] 4	.. ..
Coal, gas	10½	2 11	2 6	2 5	2 9	2 7
Shale, soft	[a] 1½	.. ..	.. ..	.. ..	.. ..	.. ..
Coal, gas	2 3	.. ..	.. ..	.. ..	.. ..	.. ..
Floor, hard shale.						
Thickness of bed	6 11	6 4	5 9	6 2	5 1	5 8½
Thickness of coal sampled	5 6½	5 2	4 8	4 10	4 9	5 0

[a] Not included in sample.

Section A (sample 24055) was measured at face of 21 room, 3 left heading, 4,400 feet S. 70° E. from pit mouth. Section B (sample 24056) was measured at face of 21 room, 4 left heading, 4,700 feet S. 65° E. from pit mouth. Section C (sample 24057) was measured at face of 10 room, 5 left heading, 4,000 feet S. 55° E. from pit mouth. Section D (sample 24058) was measured at face of 11 room, 6 left heading, 4,200 feet S. 50° E. from pit mouth. Section E (sample 24059) was measured at face of 5 room, 1 left heading, 3,200 feet N. 80° E. from pit mouth. Section F (sample 24060) was measured at face of 15 room, 2 left heading, 4,100 feet S. 75° E. from pit mouth.

The ultimate analysis of a composite sample made by combining face samples 24055 to 24060 is given under laboratory No. 24061.

Room-and-pillar system of mining. In 1916 the coal was undercut with machines and shot down with black blasting powder. The output was 950 tons a day.

HARRISON COUNTY.[a]

LOST CREEK. CALIF MINE.

Analyses 22323, 22324, 22321, 22322, 22325, and 22326 (pp. 117–118). Bituminous coal, Fairmont field, from Calif mine; also known as Redstone No. 1, a drift mine about 2 miles southwest of Lost Creek, on a branch line of the Baltimore & Ohio R. R.

[a] The coal beds of this county are described in detail in Reports on Doddridge and Harrison Counties, State Geol. Survey, 1912, pp. 560–640.

paralleling the main line. Coal bed, Redstone; Carboniferous age, Monongahela formation. The bed is 30 to 50 feet above the Pittsburgh bed. Thickness, 4½ to 6½ feet. The immediate roof is soft "draw slate" 2 inches to 3 feet thick; floor, smooth soft clay. Occasional intrusions of clay displace the coal for a distance of a few feet. The bed was sampled by D. J. Parker on May 26, 1915, as described below:

Sections of coal bed in Calif mine.

Section	A	B	C	D	E
Laboratory No.	22323	22322	22321	22324	22325
Roof, soft shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal, slightly soft	2 7	2 6	2 7	2 6	2 5
Sulphur	.. ¼	.. ..	.. ..	.. ..	.. ..
Coal, hard	2 ¾	2 7½	3 2½	2 3½	3 9
Floor, smooth, soft clay.					
Thickness of bed	4 8	5 1½	5 9½	4 9½	6 2
Thickness of coal sampled	4 8	5 1½	5 9½	4 9½	6 2

Section A (sample 22323) was cut at the face of 3 room, Boone or Davis heading, about 900 feet southeast of the mine mouth. Section B (sample 22322) was cut at face of McWhorter entry, about 1,300 feet southeast of the mine mouth. Section C (sample 22321) was cut at the face of 2 room, Lost Creek heading, about 950 feet southeast of the mine mouth. Section D (sample 22324) was cut at face of Lost Creek heading, about 1,000 feet east of the mine mouth. Section E (sample 22325) was cut from pillar in 7 room, 2 right entry, about 550 feet southwest of the mine mouth.

The ultimate analysis of a composite sample, made by combining laboratory Nos. 22321, 22322, 22323, 22324, and 22325, is given under laboratory No. 22326.

The bed is vertically about 250 feet above the Lost Creek Valley and is fairly close to the hill tops. The upper part of the seam is slightly softer than the lower part. The roof and floor material does not become badly mixed with the coal in mining and loading. In 1915 the mine was comparatively new. It promised to have a life of approximately 15 years. The coal was mined by the room-and-pillar method. The coal was partly undercut and partly shot off the solid with permissible explosives. The coal was screened over stationary bar screens 14 feet long, 1 inch spacing. The coal passing over the bars was shipped as run of mine, and that passing through as slack. Pickers were employed on the railroad cars. The output was about 350 tons daily. There was about 300 feet of cover over the points where samples were taken.

Lost Creek. Righter No. 1 Mine.

Analyses 22332, 22333, 22334, 22335, 22336, and 22337 (p. 118). Bituminous coal, Fairmont field, from Righter No. 1 mine, a drift mine about 1¼ miles southwest of Lost Creek, on a spur of the Baltimore & Ohio R. R. leaving the main line of the railroad at Lost Creek. Coal bed, Redstone; Carboniferous age, Monongahela formation. It is about 30 to 50 feet above the Pittsburgh bed, and 50 to 70 feet below the Sewickly bed. Thickness 5 feet to 7 feet 6 inches, averaging 6 feet. Roof, soft "draw slate," varying from a few inches to 3 feet in thickness; floor, smooth, soft fire clay. The bed was sampled by D. J. Parker, on May 25, 1915. Section A (sample 22336) was cut 50 feet from face of 9 room, 1 left heading, about 450 feet east of the mine mouth, and represented a 6-foot 7-inch cut of hard coal. Section B (sample 22335) was cut in 15 room, 1 left heading, about 650 feet southeast of the mine mouth, and represented a 6-foot 9½-inch cut of hard coal. Section C (sample 22334) was cut 10 feet from face of 11 room, 2 left heading, about 850 feet southeast of the mine mouth, and represented a 7-foot 2½-inch cut of hard coal. Section D (sample 22332) was cut at face of 7 room, 1 right heading, about 650 feet southwest of the mine mouth, and represented a 6-foot 4-inch cut of hard coal. Section E (sample 22333) was cut at face of 2 room, 1 right heading, 1 right heading, about 800 feet southwest of the mine mouth, and represented a 6-foot 4½-inch cut of hard coal.

The ultimate analysis of a composite sample made by combining face samples 22332, 22333, 22334, 22335, and 22336 is shown under laboratory No. 22337.

The room-and-pillar system of mining is used. The roof is not difficult to hold, and was considered good throughout the mine. The floor did not mix with the coal in mining. Intrusions of clay, as horsebacks, in places displace the coal for a distance of a few feet, but without any throw of strata; however, some fault displacements are also encountered. The mine was wet. In 1915 the coal was shot off the solid with permissible explosive; it was too hard to be undercut by hand. Screening was done over stationary bar screens, 14 feet in length, having bars set 1 inch apart. The product over the bar screens was said to be sold as "run-of-mine" coal, and that going through the screens, as slack. The output of the mine was about 500 tons a day. The mine was expected to have a lifetime of about 40 years, and to produce about 35 per cent of its coal from advance-work rooms and entries, and 50 to 55 per cent from pillars.

KANAWHA COUNTY.[a]

PUTNEY. PUTNEY NO. 1 MINE.

Analyses 23892, 23893, 23894, 23895, 23896, and 23897 (p. 118). Bituminous coal, Kanawha field, from Putney No. 1 mine, a drift mine one-fourth mile east of Putney station, at the end of Campbells Creek R. R., a branch of the Kanawha & Michigan Ry. Coal bed, No. 5 Block; Carboniferous age, Allegheny formation. It lies 1 to 10 feet under the East Lynn sandstone, and 60 to 200 feet above the Kanawha black flint. It is thought to represent the lower and middle Kittanning beds combined. The bed is generally a multiple one, having several partings of shale and bone. The coal is usually of "Block" type, being hard and breaking into large blocks. It forms an excellent steam and domestic fuel, as it does not disintegrate when exposed to the air. The coal outcrops 50 feet above the bed of Campbells Creek, and 300 feet from the top of the hills. It is composed almost entirely of a hard gray splint, merging into a semi-splint of a brighter luster near the bottom. Thickness, 4 feet 8 inches to 7 feet, averaging 5 feet 6 inches. Dip, slight, in northerly direction. The faces and butts are pronounced. Roof, 30 inches of "draw slate," of poor quality and of sandstone of good quality; floor, hard clay 1 inch thick, smooth surface. The bed was sampled by D. J. Parker and G. W. Grove on January 6, 1916, as described below:

Sections of coal bed in Putney No 1 mine.

Section	A	B	C	D	E
Laboratory No	23895	23894	23893	23896	23892
Roof, "draw slate" and sandstone.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal, splint	10	10	10	10	10
Bone	[a] 2	[a] 2	[a] 2	[a] 2	[a] 2
Coal, splint	4 10	4 3	4 3	4 1	4 0
Floor, hard clay.					
Thickness of bed	5 10	5 3	5 3	5 1	5 0
Thickness of coal sampled	5 8	5 1	5 1	4 11	4 10

[a] Not included in sample.

Section A (sample 23895) was cut from face of 30 left heading, 7,200 feet N. 46° E. from pit mouth. Section B (sample 23894) was cut from face of 28 right heading, 7,500 feet N. 70° E. from pit mouth. Section C (sample 23893) was cut from face of 2 room, 26 right heading, 7,100 feet N. 55° E. from pit mouth. Section D (sample 23896) was cut from face of 2 room, 28 left heading, 7,800 feet N. 45° E. from pit mouth. Section E (sample 23892) was cut from face of 22 room, 22 right heading, 6,500 feet N. 75° E. from pit mouth.

[a] The coal beds of this county are described in detail in Report on Kanawha County, State Geol. Survey, 1914, pp. 400–578.

The ultimate analysis of a composite sample made by combining face samples 23892 to 23896 is given under laboratory No. 23897.

In 1916 the coal was mined by the room-and-pillar system; it was undercut by chain machines and shot down with black powder fired by squibs. The tipple was of wood, designed to handle 1,400 tons per day. There were 3 loading tracks with an empty-car storage capacity of 60 railroad cars. The tipple was equipped with bar screens, 10 feet long, 6 feet wide, with 2-inch openings. Two grades of coal were usually made, lump and screenings. About one-third of the output passed through the screens. The coal was picked on the railroad cars by four pickers. The main impurity is a persistent band of bone or "niggerhead" 2 inches thick, which occurs 10 inches from the top of the bed. The daily output was 1,400 tons; maximum run, 1,800 tons. The estimated lifetime of the mine was 8 years. There were about 1,500 acres unmined.

WARD. NO. 3 MINE.

Analyses 23919, 23920, 23921, 23922, 23923, 23924, and 23925 (p. 119). Bituminous coal, Kanawha field, from No. 3 mine, a drift mine one-half mile south of Ward, on a branch of the Kanawha & Michigan Ry. Coal bed, Coalburg; Carboniferous (Pottsville) age, Kanawha group. The coal outcrops 360 feet above the bed of Kellys Creek. It is a fairly persistent, multiple-bedded coal, and in character much resembles the Winifrede coal. The bed contains much splint coal with alternating layers of softer or "gas" coal. In this mine, with the exception of a band of gas coal at the bottom, about 6 inches thick, the entire seam is hard, gray splint coal. Thickness, 4½ to 6 feet, averaging 5½ feet. Dip, N. 45° W. Roof, 8 to 14 inches of "draw slate," which is generally taken down; floor, gritty, hard fire clay, with smooth surface. The faces and butts are well defined. The bed was sampled by D. J. Parker and H. D. Jones on January 13, 1916, as described below:

Sections of coal bed in No. 3 mine.

Section	A		B		C		D		E		F	
Laboratory No.	23923		23924		23922		23921		23919		23920	
Roof, "draw slate."	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Bone		[a] 6		[a] 6		[a] 6		[a] 4		[a] 3		[a] 2
Coal, splint	1	7	1	6	1	3½	1	8	1	5	1	2
Bone		[a] 4		[a] 4		[a] 4		[a] 4		[a] 4		[a] 5
Coal, splint	1	3	1	5	1	7	1	3	1	6	1	4
Bone		[a] 1		[a] 1		[a] 1		[a] 1		[a] 1		[a] 2
Coal, splint	1	4	1	4	1	4	1	8	2	0	1	6
Coal, gas		6		6		6		6		6		6
Floor, clay.												
Thickness of bed	5	7	5	8	5	7½	5	10	6	1	5	3
Thickness of coal sampled	4	8	4	9	4	8½	5	1	5	5	4	6

[a] Not included in sample.

Section A (sample 23923) was cut from face of 7 room, 20 heading, 10,600 feet S. 45° E. from pit mouth. Section B (sample 23924) was cut from face of 5 room, 3 north heading, 1 east heading, 10,800 feet S. 25° E. from pit mouth. Section C (sample 23922) was cut from face of 27 room, 24 heading, 10,650 feet S. 10° E. from pit mouth. Section D (sample 23921) was cut from face of 21 room, 25 heading, 10,400 feet south from pit mouth. Section E (sample 23919) was cut from face of 12 room, 31 heading, 10,750 feet S. 30° W. from pit mouth. Section F (sample 23920) was cut from face of 2 room, 6 butt heading, 10,750 feet S. 45° W. from pit mouth.

The ultimate analysis of a composite sample made by combining face samples 23919 to 23924 is given under laboratory No. 23925.

The mine is worked by the room-and-pillar system. In 1916 the coal was undercut with chain machines, and shot down with black powder fired by squibs. The tipple was of wood, and designed to handle 1,400 tons per day. The tipple was equipped with bar screens, 9 feet long and 6 feet wide, with 1½-inch openings between the bars.

About 2 per cent of the entire output was shipped as run-of-mine coal. About two-thirds of the output was lump and one-third screenings. The coal was picked both in the mines and on the railroad cars. The roof generally consisted of a treacherous "draw slate," 8 to 14 inches thick, which was taken down throughout the mine to insure safety. The "draw slate" was seemingly full of slips. The bottom was composed of hard, gritty clay, averaging 4 inches in thickness, which did not become mixed with the coal in mining. The average daily output was 900 tons, with a single shift. The estimated lifetime of the mine was 40 years. There was approximately 1,000 acres unmined.

LOGAN COUNTY.[a]

Accoville. Island Creek Mine.

Analyses 23414 to 23419 (p. 119). Bituminous coal, Big Sandy field, from Island Creek mine, a drift mine on the east side of the right fork of Buffalo Creek, 0.4 mile southeast of Accoville, on a branch line of the Chesapeake & Ohio Ry., Guyan Valley division. Coal bed, Cedar Grove, locally known as Island Creek; Carboniferous age, Kanawha group. The coal outcrops approximately 320 feet above the creek bed and lies 270 feet above the Campbell Creek (No. 2 or Gas) bed. The mine is opened directly over the Big Eagle mine. Thickness, 3 feet 11 inches to 5 feet, averaging about 4 feet 8 inches; dip, approximately 1° NW. The coal is free from impurities other than occasional streaks of "sulphur," and consists of gas coal with streaks of semisplint coal; it is hard and nonfriable and has no faces or butts. Roof is composed of about 3 feet of hard shale. Floor is hard, smooth shale which does not become mixed with the coal in mining. The bed was sampled by D. J. Parker and H. D. Jones on November 25, 1915, as described below:

Sample 23414 was cut from face of main west entry, 1,400 feet west from pit mouth. and represented 4 feet 8 inches of coal. Sample 23415 was cut from face of 1 west entry, south entry, 1,600 feet S. 45° W. from pit mouth, and represented 4 feet 9 inches of coal. Sample 23416 was cut from face of main south entry, 1,400 feet S. 30° W, from pit mouth, and represented 4 feet 10 inches of coal. Sample 23417 was cut from face of 1 west entry, north entry, 1,400 feet N. 80° W. from pit mouth, and represented 3 feet 11 inches of coal. Sample 23418 was cut from face of main east entry, 700 feet S. 15° W. from pit mouth, and represented 5 feet of coal. Each sample represented the full thickness of the bed at the point sampled.

The ultimate analysis of a composite sample made by combining face samples 23414, 23415, 23416, 23417, and 23418 is given under laboratory No. 23419.

The coal is mined by the room-and-pillar system. In 1915 the coal was undercut with machines and shot down with black blasting powder by the miners during the shift. The coal was dumped at the headhouse into a 50-ton bin, then lowered to the foot of the incline in steel monitors of 5 tons capacity and discharged into a 200-ton storage bin, from which the railroad cars were loaded. The entire output was shipped as run-of-mine, and was used exclusively for steam purposes. Two pickers were employed on the railroad cars. The average daily output, working single shift, was 300 tons. It was planned to increase the output in the near future to 1,000 tons per day. There was approximately 550 acres of coal unmined. The probable lifetime of the mine was 18 years.

Accoville. Big Eagle Mine.

Analyses 23407 to 23413 (p. 113). Bituminous coal, Big Sandy field, from Big Eagle (Avon No. 2) mine, a drift mine opened on the east side of the right fork of Buffalo Creek, one-fourth mile southeast of Accoville station, on a branch of the Chesapeake & Ohio Ry., Guyan Valley division. Coal bed, known as the Campbell Creek (No.

[a] The coals of this county are described in detail in Report on Logan and Mingo Counties, West Virginia State Geol. Survey, 1914, pp. 285-735.

2 Gas); Carboniferous (Pottsville) age, Kanawha group. The coal outcrops approximately 50 feet above the bed of the creek. The bed contains both gas and splint coal; it ranges in thickness from 6 to 9 feet, average 7 feet. About 9 inches from the top is a persistent bone parting about 6 inches thick, resembling coal interlaminated with bone. The bone tends to stick to the coal both above and below and is difficult to separate. Near the middle of the bed are two shale bands about 1½ and 4½ inches thick with 1 inch of coal between. Two to three inches from the bottom is a thin band of shale averaging one-fourth inch thick. Both the shale and the bottom coal are gobbed. Immediate roof, sandstone streaked with coal; in some parts of the mine this sandstone is overlain with 6 inches of coal, and in such places the roof tends to fall. Floor, soft clay, which in wet places becomes mixed with the coal unless care is taken. The bed is free from faults, rolls, or horsebacks, and dips slightly and irregularly northwest. Faces irregular. The bed was sampled by D. J. Parker and H. D. Jones on November 24, 1915, as described below:

Sections of coal bed in Big Eagle mine.

Section	A	B	C	D	E	F
Laboratory No.	23407	23412	23408	23409	23410	23411
Roof, sandstone.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal, gas	-- --	-- --	-- --	-- --	-- --	7
Shale	-- --	-- --	-- --	-- --	-- --	*a* 1
Coal, gas	9½	1 0	1 1	1 0	10	11
Bone	*a* 6	*a* 6	*a* 5½	*a* 4½	*a* 8	*a* 5
Coal, gas	1 11	1 9	1 11	2 0	2 1	2 0
Shale	*a* 1½	*a* 1½	*a* 2	*a* 1½	*a* 4	*a* 2½
Coal, gas	*a* 1	*a* 1	*a* 1	*a* 1	*a* 1	*a* 1
Shale	*a* 4½	*a* 4	*a* 4½	*a* 4½	*a* 5	*a* 4½
Coal	8	10	8	8½	9½	9½
Coal, splint	4	3	2½	2½	2½	2
Coal, gas	2 4½	2 4	2 2	2 3½	2 1½	2 4
Shale	*a* ¼	*a* ¼	*a* ¼	*a* ¼	*a* ¼	*a* ¼
Coal, gas	*a* 2	*a* 2	*a* 2	*a* 2	*a* 3	*a* 3
Floor, soft clay.						
Thickness of bed	7 4¼	7 4¾	7 3¾	7 4½	7 9¾	8 2½
Thickness of coal sampled	6 1	6 2	6 ½	6 2½	6 ½	6 9½

a Not included in sample.

Section A (sample 23407) was cut from face of air course, 2 west entry, south entry, 2,100 feet S. 45° W. from pit mouth. Section B (sample 23412) was cut from face of main north entry, 900 feet N. 60° W. from pit mouth. Section C (sample 23408) was cut from face of 1 west entry, north entry, 1,200 feet west from pit mouth. Section D (sample 23409) was cut from face of 15 room, 1 west entry, south entry, 1,600 feet S. 65° W. from pit mouth. Section E (sample 23410) was cut from face of 3 room, 4 west entry, south entry, 1,500 feet S. 30° W. from pit mouth. Section F (sample 23411) was cut from face of 3 west entry, south entry, 1,700 feet S. 45° W from pit mouth.

The ultimate analysis of a composite sample made by combining samples 23407, 23408, 23409, 23410, 23411, and 23412 is given under laboratory No. 23413.

The coal is mined by the room-and-pillar system. In 1915 the coal was undercut by machines and shot down with black powder fired by squibs. The wooden tipple, capacity 1,000 tons a day, was equipped with an automatic dump and shaking screen with an area of 100 square feet. Almost the entire output is disposed of as run-of-mine coal for coking in by-product ovens. About half of the run-of-mine coal will pass through 1½-inch perforations. Pickers were employed on the railroad cars. The main impurities are the band of bone near the top and the shale near center of seam. Daily output, single shift, was 700 tons; it was planned to increase the output to 1,500 tons. Track capacity, 30 empty and 45 loaded railroad cars. Unmined area, 1,500 acres. Probable lifetime of mine, about 18 years.

CRANECO. LORADO NO. 1 MINE.

Analyses 23509 to 23513 (pp. 119–120). Bituminous coal, Big Sandy field, from Lorado No. 1 mine, a drift mine on the south side of Buffalo Creek, one-half mile southeast of Craneco, on Guyan Valley division of the Chesapeake & Ohio Ry. Coal bed, Cedar Grove, known locally as Island Creek; Carboniferous (Pottsville) age, Kanawha group. The coal outcrops approximately 220 feet above the creek bottom. Thickness, 6 feet 2½ inches to 6 feet 8 inches; slight easterly dip. Within 3 to 4 inches of the top is a band of soft shale about one-fourth inch thick. This parting sticks to the coal above it, and the coal sticks to the roof; consequently this part is often not taken down. A shale band in middle of the bed is easily separated. Upper part of bed carries a band of semisplint coal; the lower part is soft gas coal. Faces and butts are indistinct. Roof is blue shale, which requires little timbering; bottom is hard clay, reasonably smooth, which does not become mixed with the coal in mining. The bed was sampled by D. J. Parker and H. D. Jones on December 8, 1915, as described below:

Sections of coal bed in Lorado No. 1 mine.

Section	A	B	C	D	E
Laboratory No.	23510	23512	23508	23509	23511
	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Roof, blue shale.					
Coal, gas	3	4	3	2	2
Shale	¼	¼		⅛	¼
Coal, semisplint	1 3	1 7	1 5½	1 10	2 3
Coal, gas	11	9½	10	6	5
Shale	*a* 1½	*a* ¾	*a* ¾	*a* 1	*a* ¾
Coal, gas	3 8	3 8	3 7	3 8½	3 9
Floor, hard clay.					
Thickness of bed	6 2¾	6 5½	6 2½	6 3⅝	6 8
Thickness of coal sampled	6 1¼	6 4¾	6 1¾	6 2⅜	6 7¼

a Not included in sample.

Section A (sample 23510) was cut from face of 10 room, 2 west heading, main south heading, 960 feet west of pit mouth. Section B (sample 23512) was cut from face of 4 west heading, main south heading, 1,375 feet S. 45° E. of pit mouth. Section C (sample 23508) was cut from face of main south heading, 1,700 feet south of pit mouth. Section D (sample 23509) was cut from face of 4 east heading, main south heading, 1,280 feet S. 45° E. of pit mouth. Section E sample 23511) was cut from face of 7 room, 2 east heading, main south heading, 920 feet S. 45° E. of pit mouth.

The ultimate analysis of a composite sample made by combining face samples 23508, 23509, 23510, 23511, and 23512 is given under laboratory No. 23513.

The coal is mined by the room-and-pillar system. In 1915 it was undercut with breast and shortwall machines, and shot down with black powder, fired by squibs. The modern steel tipple, capacity 3,600 tons per day, was equipped with shaking screens, loading chutes, and car retarders. The coal was delivered to headhouse, dumped over automatic crossover dump, and lowered to tipple by retarding conveyors. The following grades of coal were usually made: 5, 4, 3, 2, and 1¼ inch lump, 5 by 2 inch and 5 by 2¼ inch egg, and 1¼-inch screenings. Because of the soft character of the bottom part of the bed 50 per cent of the coal would pass through 1¼-inch perforations. Pickers were employed at screens and on cars. The average daily output was 1,000 tons. The mine was opened in March, 1915. Track capacity, 72 empty and 72 loaded cars. There was approximately 2,000 acres to be mined from present opening. Probable life of mine, 50 years.

EARLING. EARLING NO. 1 MINE.

Analyses 23338 to 23343 (p. 120). Bituminous coal, Big Sandy field, from Earling No. 1 mine, a drift mine on the east side of Guyandotte River, 500 feet from and 100 feet above the bed of river, one-half mile northwest of Earling, on the Guyan Valley division

of the Chesapeake & Ohio Ry. Coal bed, Campbell Creek (No. 2 or Gas); Carboniferous (Pottsville) age, Kanawha group. Thickness, 4 feet 7 inches to 5 feet 8 inches, averaging 5 feet. Immediately overlying this coal is a persistent band of bone 3 to 8 inches thick, which tends to stick to the roof rather than to the coal. Near the middle of the bed is a hard persistent band of splint coal 3 to 5 inches thick. In places the coal contains local streaks of "sulphur." Roof is sandstone and gray shale, and is poor; floor is unusually soft clay, which easily becomes mixed with the coal if care is not exercised. The bed was sampled by D. J. Parker on November 19, 1916, as described below:

Sections of coal bed in Earling No 1 mine.

Section	A		B		C		D		E	
Laboratory No.	23340		23341		23342		23338		23339	
Roof, gray shale and sandstone.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Bone		[a] 3½		[a] 5½		[a] 5		[a] 8		[a] 7
Coal, gas	2	8	2	6½		9	2	2	2	3
"Mother coal"	..	..	..	..		1	..	..	..	..
Coal, gas	..	..	..	..		8½	..	..	..	..
Mud, stiff	..	..	..	..		[a] ⅝	..	..	..	..
Coal, gas	..	..	..	..		11	..	..	..	..
Coal, splint		3		5		3		4		4
Coal, gas	2	9	1	8½	1	10	1	10½	1	10
Floor, soft clay.										
Thickness of bed	5	11½	5	1½	5	½	5	½	5	0
Thickness of coal sampled	5	8	4	8	4	7⅛	4	4½	4	5

[a] Not included in sample.

Section A (sample 23340) was cut from face of 1 room, 5 B entry, 1,900 feet north from pit mouth. Section B (sample 23341) was cut from face of 1 butt, C flat entry, 2,400 feet N. 60° E. from pit mouth. Section C (sample 23342) was cut from face of 2 flat entry, 3,000 feet N. 70° E. from pit mouth. Section D (sample 23338) was cut from face of 9 A entry, 2,300 feet east from pit mouth. Section E (sample 23339) was cut from face of C flat entry, 2,200 feet N. 45° E. from pit mouth.

The ultimate analysis of a composite sample made by mixing samples 23338 to 23342 is given under laboratory No. 23343.

Room-and-pillar system of mining is used. In 1916 the coal was undercut with chain machines and shot down with black powder. The main impurity is the band of bone on top of the coal. To keep the coal reasonably free of this bone requires persistent effort. The soft character of the bottom, particles of which may become mixed with the coal in mining, makes it difficult to properly clean the coal. The tipple is equipped with a picking table and bar screens. In the upper section of the screen the bars are 1½ inches apart, 10 feet long, with an area of 60 square feet. In the lower section the bars are 6 inches apart, with same area. Two grades of coal are usually made, lump and screenings. The coal passing over the 6-inch bars constitutes 12 per cent of the entire output and is sold for domestic purposes. The remainder is shipped to by-product coking ovens, where a mixture of 18 per cent Earling and 82 per cent New River smokeless coal is used. Eight pickers are employed on the table. The average daily output was about 600 tons. There are 3 loading tracks with a capacity of 30 empty and 30 loaded cars. There was approximately 550 acres unmined. The probable lifetime of the mine was 18 years.

Omar. No. 5 Mine.

Analyses 23514 to 23519 (p. 120). Bituminous coal, Big Sandy field, from No. 5 mine, a drift mine opened on the north side of the West Fork of Pine Creek, 1 mile west of Omar, on Guyan Valley division of the Chesapeake & Ohio Ry. Coal bed, Cedar Grove, locally known as Island Creek; Carboniferous (Pottsville) age, Kanawha group. The coal bed outcrops approximately 20 feet above the bed of the creek, and contains both gas and splint coals. The bed is 6 to 9 feet thick, averaging about 7

feet. Near the middle of the bed is a persistent shale parting about 5 inches thick, which in some parts of the mine splits into two parts with 4 to 8 inches of gas coal between. Below the parting is hard splint coal. Two bands of splint are usual in the upper part of the bed. The bed is free from rolls, faults, or other disturbances. Dip, northwest, slight and somewhat irregular. Faces and butts are well defined, and the mine is laid out with reference to them. The immediate roof is hard, gray shale, requiring very little timbering. Floor is hard, shaly clay. The bed was sampled by D. J. Parker on December 9, 1915, as described below:

Sections of coal bed in No. 3 mine.

Section	A	B	C	D	E
Laboratory No.	23514	23516	23517	23518	23515
Roof, hard gray.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal, gas	2 0	1 10	1 7	1 3	1 4
Coal, splint	2¼	11	8½	1 8	1 7
Coal, gas	½	3	4½	-- --	-- --
Coal, splint	6	3	3½	-- --	-- --
Coal, gas	2	-- --	-- --	-- --	-- --
Coal, splint	½	-- --	-- --	-- --	-- --
Coal, gas	11	-- --	-- --	-- --	-- --
Shale	-- --	a 1½	a 1	a 1	a 1
Coal, gas	-- --	8	4	5	5
Shale	a 6	a 5	a 2	a 2	a 1¾
Coal, gas	3	-- --	-- --	-- --	-- --
Coal, splint	3 1	3 6	3 4	3 2	3 5
Floor, hard shaly clay.					
Thickness of bed	7 8½	7 11½	6 10½	6 9	6 11¾
Thickness of coal sampled	7 2¼	7 5	6 7½	6 6	6 9

a Not included in sample.

Section A (sample 23514) was cut from face of 3 left entry, 900 feet N. 10° W. of pit mouth. Section B (sample 23516) was cut from face of 5 right entry, 1,030 feet north of pit mouth. Section C (sample 23517) was cut from face of main entry, 1,200 feet N. 54° E. of pit mouth. Section D (sample 23518) was cut from face of 4 room, barrier entry, 1,100 feet N. 65° E. of pit mouth. Section E (sample 23515) was cut from face of main temporary tipple entry, 1,480 feet N. 80° E. of pit mouth.

The ultimate analysis of a composite sample made by combining face samples 23514, 23515, 23516, 23517, and 23518 is given under laboratory No. 23519.

The coal is mined by the room-and-pillar system. In 1915 the coal was cut by straight-face and shortwall machine in the shale band in the middle of the bed and was shot down with black blasting powder. The steel tipple, capacity 1,500 tons per day, was equipped with shaking screens, picking table, loading booms, and car retarders. The shale does not become mixed with the coal during mining to any great extent. Four pickers were required on the tipple and the cars. Three sizes were shipped: Screenings, egg, and lump. The daily output was about 500 tons, but it was planned to increase the output. The track capacity for empty and loaded cars was 35 each. There was an unmined area of 1,200 acres. The probable lifetime of the mine was 40 years. The output of No. 5 and No. 6 mines was shipped together.

McDOWELL COUNTY.[a]

COALWOOD. No. 1 MINE.

Analyses 20300 to 20302 and 20596 to 20599 (p. 121). Semibituminous coal, Pocahontas field, from No. 1 mine, a shaft mine about 1 mile from Coalwood, on the Clear Fork branch of the Norfolk & Western Ry. Coal bed, Pocahontas No. 4; Carboniferous age, Pocahontas formation. Dip, slight. Roof, black clay shale; floor, black under-

a The coals of this county are described in detail in Report on Wyoming and McDowell Counties, State Geol. Survey, 1915, pp. 258–732.

clay. Shaft, 584 feet deep. The bed was sampled at two points by Daniel Harrington and H. D. Mason, jr., on December 3, 1914, and at three points by H. D. Mason, jr., on December 13, 1914, as described below:

Sections of coal bed in No. 1 mine.

Section Laboratory No	A 20300	B 20301	C 20596	D 20597	E 20598
Roof, black clay shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	10½	11	11	10½	10
Grayish shale band	[a] 1½	[a] 1	[a] ½	[a] 1	[a] 1
Coal	1 0	1 0	11½	1 0	11
Bone	[a] 3	[a] 2½	[a] 1½	[a] 2	[a] 1½
Coal	4 9	4 1½	4 3½	4 1½	4 4½
Floor, black shale.					
Thickness of coal bed	7 0	6 4	6 4	6 3	6 4
Thickness of coal sampled	6 7½	6 ½	6 2½	6 0	6 1½

[a] Not included in sample.

Section A (sample 20300) was cut from face of main air course, 450 feet northwest of shaft bottom. Section B (sample 20301) was cut from face of main west entry, 700 feet west of shaft bottom. Section C (sample 20596) was cut from face of main haulage entry, 750 feet from shaft bottom. Section D (sample 20597) was cut from face of 2 crosscut, main haulage entry, 600 feet from shaft bottom. Section E (sample 20598) was cut from face of main empty haulage way, 700 feet southwest of shaft bottom.

The ultimate analysis of a composite sample was made by combining face samples 20300 and 20301. This sample is given under laboratory No. 20302. Another composite sample was made by combining face samples 20596, 20597, and 20598. The ultimate analysis of this sample is given under laboratory No. 20599.

The mine is new, only a small amount of development work having been done up to the time of sampling. The room-and-pillar method of mining is used. The coal was undercut by hand and was shot down by shotfirers with permissible explosives. The coal is bright, shiny, and comparatively hard; it contains one persistent band of bone. The daily production was about 100 tons, but plans were made to handle 3,000 to 4,000 tons daily, development being pushed in four directions.

Coalwood. Nora or No. 3 Mine.

Analyses 20306 to 20311 (p. 121). Semibituminous coal, Pocahontas field, from Nora or No. 3 mine, a drift mine about 2 miles from Coalwood, on the Clear Fork branch of the Norfolk & Western Ry. Coal bed, Sewell; Carboniferous (Pottsville) age, Sewell formation. The bed is several hundred feet above the No. 3 Pocohontas bed. Thickness, 3 to 4 feet. Roof, grayish shale; floor, hard gray underclay. Dip, slight, except for occasional local rolls. The bed was sampled by Daniel Harrington and H. D. Mason, jr., on December 3, 1914, as described below:

Sections of coal bed in Nora or No. 3 mine.

Section Laboratory No	A 20306	B 20307	C 20308	D 20309	E 20310
Roof, gray shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
"Rash"	.. ..	.. ..	[a] 1½	.. ..	[a] 1
Coal	1 5	1 5	1 3½	10½	1 7½
"Sulphur" band	.. ..	.. ..	.. ..	[a] ½	.. ..
Gray shale	[a] 2	[a] 2½	[a] 2½	.. ..	[a] 2
Coal	1 7	1 11½	1 7½	8	2 1
Shale band	.. ..	.. ..	.. ..	[a] 2	.. ..
Coal	.. ..	.. ..	.. ..	1 7	.. ..
Floor, hard shale.					
Thickness of bed	3 2	3 7	3 3	3 4	3 11½
Thickness of coal sampled	3 0	3 4½	2 11	3 1½	3 8½

[a] Not included in sample.

Section A (sample 20306) was cut at the face of 1 right entry, No. 2 opening, 1,750 feet southeast of pit mouth. Section B (sample 20307) was cut at the face of 3 right entry, No. 2 opening, 1,700 feet from pit mouth. Section C (sample 20308) was cut at the face of the main entry, No. 3 opening, 600 feet northwest of pit mouth. Section D (sample 20309) was cut at the face of the main entry, No. 2 opening, 1,550 feet northeast of pit mouth. Section E (sample 20310) was cut at the face of 4 right entry, No. 2 opening, 1,500 feet from pit mouth.

The ultimate analysis of a composite sample made by combining face samples 20306, 20307, 20308, 20309, and 20310 is given under laboratory No. 20311.

The room-and-pillar system of mining is used. In 1914 the coal was undercut with electric chain cutters and shot down with black powder. The miners shot and loaded the coal and tried to remove the refuse band or bands, which are thin, and hence likely to break on shooting. The coal is very friable, and the percentage of large lump coal is small. The roof does not come down in the rooms to any great extent. The coal parts readily from the roof and floor. The output was about 500 tons per day, purely from advance work, but the mine was equipped to produce 1,000 tons per day or more.

COALWOOD. THELMA OR NO. 6 MINE.

Analyses 20317 to 20324 (p. 121). Semibituminous coal, Pocahontas field, from Thelma, or No. 6 mine, a drift mine about 2 miles from Coalwood, on the Clear Fork branch of the Norfolk & Western Ry. Coal bed, known as Sewell; Carboniferous (Pottsville) age. The bed is several hundred feet vertically above the Pocahontas No. 3 bed. Thickness, 3½ to 4½ feet. Roof, cohesive black shale; floor, hard gray underclay. The bed, although usually nearly level, contains rolls, giving occasional reverse grades on haulage entries. The bed was sampled by Daniel Harrington and H. D. Mason, jr., on December 3, 1914, as described below:

Sections of coal bed in Thelma or No. 6 mine.

Section Laboratory No.	A 20317	B 20318	C 20319	D 20320	E 20321	F 20322	G 20323
Roof, black shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	1 9	1 9	1 11½	1 11½	1 11½	2 1	[a]7
Shale, gray	.. ..	.. ..	[b]2	[b]2	[b]2	[b]½	[b]6½
Clay, soft	[b]1	[b]1	.. ..	.. ..	.. ..	.. ..	.. ..
Coal	1 8	1 8	2 0	1 1	1 10	1 9½	1 1
Bone	.. ..	.. ..	.. ..	6½	.. ..	.. ..	[b]2
Coal	.. ..	.. ..	.. ..	7	.. ..	.. ..	1 7
Floor, hard shale.							
Thickness of bed	3 6	3 6	4 1½	4 4	3 11½	3 11	3 11½
Thickness of coal sampled	3 5	3 5	3 11½	3 7½	3 9½	3 10½	2 8

[a] Coal not shipped. [b] Not included in sample.

Section A (sample 20317) was cut at face of 1 right entry, main entry, No. 1 drift, 1,800 feet from pit mouth. Section B (sample 20318) was cut at face of 2 right entry, main entry, No. 1 drift, 2,000 feet from pit mouth. Section C (sample 20319) was cut at face of main entry, 3,800 feet southeast of pit mouth. Section D (sample 20320) was cut at face of 7 right entry, main entry, 3,500 feet southeast of pit mouth. Section E (sample 20321) was cut at face of 8 left entry, main entry, 3,600 feet southeast of pit mouth. Section F (sample 20322) was cut at face of 3 left entry, main entry, 3,600 feet from pit mouth. Section G (sample 20323) was cut at face of 1 left entry, No. 1 drift, 1,000 feet from pit mouth.

The ultimate analysis of a composite sample made by combining face samples 20317, 20318, 20319, 20320, 20321, 20322, and 20323 is given under laboratory No. 20324.

The mine is worked on the room-and-pillar system. In 1914 the coal was undercut with electric shortwall machines and shot down with black powder and loaded by the miners.

The coal is very soft and friable and parts readily from roof and floor in shooting. The percentage of large lump is small on account of the friable character of the coal. The roof is a cohesive black shale, remaining in place readily until shot down, and requiring very little timber. About 18 inches of roof coal was taken down in the entries, but was left up in rooms. Miners attempt to remove the shale bands and, in addition, a picking table is provided by which the fine coal is screened out. The entire product is shipped as "run of mine." The output was about 1,000 tons per day, which will probably be increased.

Huger. Lake Superior No. 1 Mine.

Analyses 20348 to 20354 (pp. 121–122). Semibituminous coal, Pocahontas field, from Lake Superior No. 1 mine, formerly Dickson-Pocahontas No. 1, a shaft mine at Huger, on the main line of the Norfolk & Western Ry. Coal bed, Pocahontas No. 3; Carboniferous age, Pocahontas formation. Thickness, 5 to 6 feet. Roof is dark "draw slate" about 2 feet thick, with a 2-inch layer of coal in middle. Above the "draw slate," which falls easily, is a cohesive black shale, which gives a fairly good, permanent roof. The floor is a hard, black underclay. The coal does not adhere to roof or floor in shooting. Shaft, 259 feet deep. The bed was sampled by Daniel Harrington on December 5, 1914, as described below:

Sections of coal bed in Lake Superior No. 1 mine.

Section	A	B	C	D	E	F
Laboratory No.	20348	20349	20350	20351	20352	20353
Shale, black.						
Roof, "draw slate," 24 inches.						
	Ft. in.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal, bright	2 1	1 11	1 11	1 11	2 0	1 11
Hard pyritic gray shale	[a] 5	[a] 4½	[a] 3	[a] 4	[a] 4	[a] 4
Coal, gravish	2 11	3 6	2 7½	2 11	2 9	3 10
Floor, hard black shale.						
Thickness of bed	5 5	5 9½	4 9½	5 2	5 1	6 1
Thickness of coal sampled	5 0	5 5	4 6½	4 10	4 9	5 9

[a] Not included in sample.

Section A (sample 20348) was cut at face of 25 room, 1 left entry, main east entry, 2,700 feet from shaft. Section B (sample 20349) was cut from face of main north entry, 2,400 feet north of shaft. Section C (sample 20350) was cut from face of 3 left entry, main east entry, about 1,000 feet from main east entry and 2,000 feet northwest of shaft. Section D (sample 20351) was cut from face of 2 left entry, main east entry, 2,000 feet from main east entry and about 2,600 feet from shaft. Section E (sample 20352) was cut from face of main east entry, 2,000 feet from bottom of shaft. Section F (sample 20353) was cut from face of main south entry, 1,200 feet south of main shaft.

The ultimate analysis of a composite sample made by combining face samples 20348 to 20353 is given under laboratory No. 20354.

The mine is worked on the room-and-pillar system. In 1914 the coal was undercut by short-wall electric chain machines mounted on trucks, the cut being made about 18 inches above the floor; by removing the bottom coal first the top coal could be shot down with minimum breakage. Permissible explosives were used. The "draw slate" in roof generally remained up until after coal was loaded from face after shooting, and where the roof was weak props were set at face after the first or "buster" shot was fired. The refuse band of pyritic shale is hard, hence does not break readily, and was effectively removed by the miners. The mine was thoroughly equipped with machinery and safety appliances. The mining was strictly advance work, 20 to 25 per cent of the coal being removed in advancing, leaving heavy pillars for retreat work. The output was about 600 tons per day, but the equipment would handle 1,000 to 1,200 tons per day. The mine has a probable life of several years.

JENKINJONES. JENKINJONES NO. 6 MINE.

Analyses 20518 to 20524 (p. 122). Semibituminous coal, Pocahontas field, from Jenkinjones No. 6 mine, at Jenkinjones, the terminus of the Tug River branch of the Norfolk & Western Ry. Coal bed, Pocahontas No. 3; Carboniferous (Pottsville) age, Pocahontas formation. Thickness, 7½ to 10½ feet. Roof, smooth black shale; floor, dark gray shale. The bed has one persistent bony-coal parting, 2 to 4 inches thick. The bed was sampled December 11, 1914, by H. D. Mason, jr., as described below:

Sections of coal bed in Jenkinjones No. 6 mine.

Section	A	B	C	D	E	F
Laboratory No.	20518	20519	20520	20521	20522	20523
Roof, black shale.						
Coal	4 0	3 9	3 10	3 11	3 10	4 3
Coal, bony	4	[a] 3	[a] 3	[a] 2	[a] 2	[a] 2
Coal	6 2	6 3	3 6	5 7	5 8	5 6
Floor, shale.						
Thickness of bed	10 6	10 3	7 7	9 8	9 8	9 11
Thickness of coal sampled	10 6	10 3	7 4	9 6	9 6	9 9

[a] Not included in sample.

Section A (sample 20518) was cut from face of F–6 entry, F entry, 3,600 feet from pit mouth. Section B (sample 20519) was cut from face of F–5 entry, F entry, 3,700 feet from pit mouth. Section C (sample 20520) was cut from face of 6–1 main entry, 3,100 feet from pit mouth. Section D (sample 20521) was cut from face of 6–8 main entry, 2,225 feet from pit mouth. Section E (sample 20522) was cut from face of M–11 entry, main entry, 1,700 feet from pit mouth. Section F (sample 20523) was cut from face of P entry, P–11 entry, 6–8 main entry, 2,400 feet from pit mouth.

The ultimate analysis of a composite sample made by combining face samples 20518 to 20523 is given under laboratory No. 20524.

The mine has three drift openings, and the coal is hauled around the mountain side to a large timber tipple, having long picking tables designed to handle 2,000 tons per day. In 1914 the coal was undercut by hand and by machine, and was shot down with black powder. The coal was all shipped as run of mine. The output was about 500 tons per day, but it was expected that this would soon be increased to 2,000 tons per day. The company had about 20,000 acres of coal land at this place.

For analyses and descriptions of other samples of coal from this mine see Bureau of Mines Bull. 85, 1914, pp. 116, 355.

JENKINJONES. JENKINJONES NO. 7 MINE.

Analyses 20507 to 20512 (p. 122). Semibituminous coal, Pocahontas field, from Jenkinjones No. 7 mine, at Jenkinjones, the terminus of the Tug River branch of the Norfolk & Western Ry. Coal bed, Pocahontas No. 3; Carboniferous (Pottsville) age, Pocahontas formation. Thickness, 7 feet 2 inches to 11 feet. Roof, smooth, black shale; floor, dark gray shale. The bed has one persistent bony-coal parting about 4 inches thick, about 4 feet from the floor. The bed was sampled December 12, 1914, by H. D. Mason, jr., as described below:

Sections of coal bed in Jenkinjones No. 7 mine.

Section	A	B	C	D	E
Laboratory No.	20507	20508	20509	20510	20511
Roof, black shale.					
Coal	3 10	3 10	3 2	3 8	4 3
Coal, bony	[a] 3	[a] 2	[a] 2	[a] 4	[a] 4
Coal	3 9	4 4	3 10	3 6	6 5
Floor, gray shale.					
Thickness of bed	7 10	8 4	7 2	7 6	11 0
Thickness of coal sampled	7 7	8 2	7 0	7 2	10 8

[a] Not included in sample.

Section A (sample 20507) was cut from face of 2 right entry, 7–5 main entry, 3,300 feet from pit mouth. Section B (sample 20508) was cut from face of 3 right entry, 7–5 main entry, 3,400 feet from pit mouth. Section C (sample 20509) was cut from face of 7 right entry, 7–1 main entry, 3,400 feet from pit mouth. Section D (sample 20510) was cut from face of 4 parallel air course, 3,500 feet from pit mouth. Section E (sample 20511) was cut from face of 7–1 main entry, 4,100 feet from pit mouth.

The ultimate analysis of a composite sample made by combining face samples 20507 to 20511 is given under laboratory No. 20512.

The mine is opened by two drifts and the coal is hauled around the mountain side to a wooden tipple of 2,000-ton capacity. In 1914 the coal was cut by hand or by machine in the middle of the vein and shot down with black powder. The coal was all shipped as run-of-mine. The coal is picked on the cars and the picking tables, but not in the mine. The picking tables were designed to handle 2,000 tons per day of mine-run coal. The output was 500 tons per day, but it was expected to increase this to 2,000 tons per day. There were two loading tracks. There was about 20,000 acres of coal land still unmined.

For analyses and descriptions of other samples of coal from this mine see Bureau of Mines Bull. 85, 1914, pp. 116, 355.

Jenkinjones. Jenkinjones No. 8 Mine.

Analyses 20531 to 20536 (pp. 122–123). Semibituminous coal, Pocahontas field, from Jenkinjones No. 8 mine, a drift mine at Jenkinjones, the terminus of the Tug Fork branch of the Norfolk & Western Ry. Coal bed, Pocahontas No. 3; Carboniferous (Pottsville) age, Pocahontas formation. Thickness, 6 feet 2 inches to 8 feet 6 inches. Roof, smooth, black shale; floor, dark gray shale. The bed was sampled by H. D. Mason, jr., on December 12, 1914, as described below:

Sections of coal bed in Jenkinjones No. 8 mine.

Section	A	B	C	D	E
Laboratory No	20531	20532	20533	20534	20535
Roof, black shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	4 0	3 11	4 2	3 10	3 10
Coal, bony	[a] 2	[a] ½	[a] 2	[a] 2	[a] 2
Coal	4 4	2 9½	1 10	2 3	3 0
Floor, gray shale.					
Thickness of bed	8 6	6 9	6 2	6 3	7 0
Thickness of coal sampled	8 4	6 8½	6 0	6 1	6 10

[a] Not included in sample.

Section A (sample 20531) was cut from face of F entry, 8–1 main entry, 1,530 feet northeast of pit mouth. Section B (sample 20532) was cut from face of H–2 entry, I entry, 1,000 feet from pit mouth. Section C (sample 20533) was cut from face of B entry, A entry, 8–D main entry, 1,800 feet from pit mouth. Section D (sample 20534) was cut from face of B airway, A entry, 1,800 feet from pit mouth. Section E (sample 20535) was cut from face of F–2 entry, F entry, main entry, 1,600 feet from pit mouth.

The ultimate analysis of a composite sample made by combining face samples 20531, 20532, 20533, 20534, and 20535 is given under laboratory No. 20536.

Mine No. 8 is opened by three openings, and the coal is hauled around the mountain side to a wooden tipple equipped with long picking tables capable of handling daily 2,500 tons run of mine. In 1914 the coal was cut by machine and by hand in the center of the bed, and was shot down with black powder. The coal was all shipped as run of mine, being picked on railroad car and picking table, but not in the mine. The output was 400 to 500 tons daily, and was expected to be increased to 2,500 tons daily. There were three loading tracks. There were about 20,000 acres of coal land in connection with this mine.

LEX. CENTRAL WEST MINE.

Analyses 17469, 17470, and 17471 (p. 123). Semibituminous coal, from Central West mine, a drift mine on the west side of Dry Fork Valley opposite Lex, on the Canebrake branch of the Norfolk & Western Ry. Coal bed locally known as Pocahontas No. 5; Carboniferous (Pottsville) age, Pocahontas formation. The bed varies from 3 to 3½ feet thick and lies nearly horizontal. Roof and floor, shale. Cover at points of sampling, 200 to 800 feet. The bed was measured and sampled by Eugene Stebinger, June 7, 1913, as described below:

Sections of coal bed, at Central West mine.

Section	A		B	
Laboratory No.	17469		17470	
Roof, shale.	*Ft.*	*in.*	*Ft.*	*in.*
Coal, lustrous, with cubic cleavage		4		3
Coal, laminated, dull, with shiny faces		7	..	..
Coal, lustrous, with fine cubic cleavage	..	..		4
Coal, gray splint, very hard, spalls off in slabs		11	..	..
Coal, dull gray splint, flaky and softer than usual	..	..	1	5
Coal, soft and lustrous, with cubic cleavage	1	6	1	1
Floor, shale.				
Thickness of bed	3	4	3	1
Thickness of coal sampled	3	4	3	1

Section A (sample 17469) was cut from the mouth of dip entry, main entry, 500 feet in. Sample dry. Section B (sample 17470) was cut from 2 left entry, main entry, 1,500 feet in. Sample dry.

The ultimate analysis of a composite sample made by mixing samples 17469 and 17470 is given under laboratory No. 17471.

The mine was comparatively small, producing about 100 tons per day at date of sampling.

TWIN BRANCH. MAHER OR NO. 4 MINE.

Analyses 22480 to 22488 (p. 123). Semibituminous coal, Pocahontas field, from Maher or No. 4 mine, a drift mine about 1 mile north of Twin Branch post office, on a branch line of the Norfolk & Western Ry. Coal bed, Sewell; Carboniferous (Pottsville) age, Sewell formation. Thickness, 36 to 42 inches. Slight northwest dip. Roof, hard, black shale; floor, hard, shaly underclay, with smooth surface. The bed was sampled by D. J. Parker, on June 14 and 15, 1915.

Sections of coal bed in Maher or No. 4 mine.

Section	A		B		C		D		E		F	
Laboratory No.	22480		22481		22482		22483		22484		22485	
Roof, black shale.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Bone	..	..		[a]2	..	..	..	..	..	..	..	..
Coal	3	2½	3	5	2	9		11	3	3	3	3
"Sulphur"	..	..	..	..	Streak.		..	..	..	..	..	..
"Mother coal"	..	..	..	..		½		½	Streak.		Streak.	
Bone	..	..	..	..	..	..	..	..	..	..	..	..
Coal	..	..	..	..		5	2	3	..	..	..	..
Floor, shaly underclay.												
Thickness of coal bed	3	2½	3	7	3	2½	3	2½	3	3	3	3
Thickness of coal sampled	3	2½	3	5	3	2¼	3	2⅛	3	3	3	3

[a] Not included in sample.

Section A (sample 22480) was cut from the face of 10 room, 2 right heading, 8 left heading, 1 parallel heading, 3,100 feet N. 50° E. from pit mouth. Section B (sample 22481) was cut from pillar in 2 room (10 feet inby room mouth), 2 left heading, 6 right heading, 2 parallel heading, 4,700 feet S. 80° E. of pit mouth. Section C (sample

22482) was cut from face of 1 right heading, 12 left heading, 2,900 feet N. 30° E. of pit mouth. Section D (sample 22483) was cut from face of 1 right heading, 10 left heading, 2,500 feet N. 30° E. of pit mouth. Section E (sample 22484) was cut from face of main heading 3,800 feet N. 60° E. of pit mouth. Section F (sample 22485) was cut from face of 1 parallel heading, 3,250 feet N. 45° E. of pit mouth.

The ultimate analysis of a composite sample made by combining samples 22480, 22481, 22482, 22483, 22484, and 22485, is shown under laboratory No. 22486.

Laboratory Nos. 22487 and 22488 represented samples taken from cars which were loaded with coal from various parts of the mine.

This mine and the No. 2 mine are opened on opposite sides of Twin Branch, about 300 feet apart, and the coal from both mines is dumped over the same tipple, screened, and delivered to the same railroad cars. The tipple is of steel and will probably handle 2,000 tons of coal or more per day. The tipple is equipped with adequate shaking screens and conveyors for sizing the coal into lump, egg, nut, and slack sizes. At the time of sampling about 1,200 tons per day was being shipped, 700 tons of which came from No. 4 mine. The coal was not washed. The coal was both pick and machine mined, pneumatic electric punchers being used, and was shot down with black powder by the miners during the shift. The coal is for the most part very friable, with occasional hard streaks. The track capacity was 40 empty and 40 loaded cars.

Vivian. King No. 98 Mine.

Analyses 24799, 24800, and 24801 (p. 123). Semibituminous coal, Pocahontas field, from King No. 98 mine, a slope mine on Laurel Creek, one-half mile west of Vivian and 9½ miles from Welch, on the Norfolk & Western Ry. Coal bed, Pocahontas No. 3; Carboniferous (Pottsville) age, Pocahontas formation. Thickness, 5 to 6½ feet. Roof is "draw slate" 8 inches thick, overlain by 24 inches of black and gray shale; floor is hard clay. The bed has a characteristic bone parting near the middle, about 3 inches thick. The bed was sampled by E. Steidle and J. W. Koster on March 30, 1916, as described below:

Sections of coal bed in King No. 98 mine.

Section	A	B
Laboratory No.	24799	24800
Roof, shale.		
Coal	1 6	1 9½
Shale, "sulphur" bearing	¼	-- --
Coal	10¾	-- --
Coal, bony	[a] 3	[a] 3
Coal	2 8	3 2
Floor, hard clay.		
Thickness of bed	5 4	5 2½
Thickness of coal sampled	5 1	4 11½

[a] Not included in sample.

Section A (sample 24799) was cut in 3 room, 1 pocket, 9 east entry, 7,500 feet northeast of opening. Section B (sample 24800) was cut at face of 12 room, Scotland entry, 2,700 feet east of opening.

The ultimate analysis of a composite sample made by combining face samples 24799 and 24800 is given under laboratory No. 24801.

The mine is opened by a rock slope, the coal being reached at a vertical distance of about 200 feet beneath the surface. The mine was opened in 1905. The coal is mined by the room-and-pillar system. In 1916 the coal was undercut with picks and machines and shot down with black powder any time during the shift. The percentage of recovery of coal was 70 to 85 per cent. The roof was bad, the top consisting of treacherous friable shale. The output was about 1,000 tons per day. The tipple, which has a

storage bin capacity of 550 tons, is equipped with bar screens with 1½ and 3½ inch openings, and with shaker screens with one-fourth and one-half inch openings. The screenings are coked in beehive ovens. There are two loading tracks with a capacity of 50 empty railroad cars.

VIVIAN. CARSWELL MINE.

Analyses 25314 to 25317 (p. 123). Bituminous coal, Pocahontas field, from Carswell mine, a shaft mine 1½ miles northwest of Vivian on the main line of the Norfolk & Western Ry. Coal bed, Pocahontas No. 4; Carboniferous (Pottsville) age, Pocahontas formation. The bed averages 4½ feet thick, and has a persistent bone parting near the center and a one-half inch band of "sulphur" above. Pocahontas No. 3 bed is reached by a shaft 305 feet deep, and the No. 4 bed is worked from this shaft at a vertical distance of 65 feet above the No. 3 bed. Roof, shale; floor, clay. Mine was opened in 1913. The bed was sampled by W. B. Plank and Jesse Henson on May 30, 1916, as described below:

Sections of coal bed in Carswell mine.

Section	A	B	C
Laboratory No.	25314	25315	25316
Roof, shale.	Ft. in.	Ft. in.	Ft. in.
Coal	.. ..	8	.. ..
"Mother coal"	.. ..	¼	.. ..
Coal	1 9	1 1	1 10
Bone	a 3	a 1	a 2
Coal	7	7	7½
Bone	½	a 1	½
Coal	1 5½	1 0	1 6
Floor, clay.			
Thickness of bed	4 1	3 6½	4 2
Thickness of coal sampled	3 10	3 4¼	4 0

a Not included in sample.

Section A (sample 25314) was gathered on right rib, crosscut, 1 right entry, 65 feet from face and 500 feet from shaft bottom. Section B (sample 25315) was gathered on right rib, 1 left main entry, west entry, 100 feet from face. Section C (sample 25316) was gathered on right rib, 1 right entry, 300 feet from shaft bottom.

The ultimate analysis of a composite sample made by combining samples 25314, 25315, and 25316 is given under laboratory No. 25317.

The mine is worked by the room-and-pillar system. No rooms had been turned at time of gathering samples. The coal was undercut by hand and shot down with black powder by shot firers after the miners had left the mine. About 80 per cent recovery of the coal was expected eventually.

VIVIAN. NORFOLK NO. 3 MINE.

Analysis 25370 (p. 123). Semibituminous coal, Pocahontas field, from Norfolk No. 3 mine, a drift mine near Vivian, on Norfolk & Western Ry. Coal bed, Pocohontas No. 3; Carboniferous (Pottsville) age, Pocahontas formation. Bed is about 8½ feet thick and lies nearly horizontal.

Sample 25370 represented a car sample of nut coal from this mine. The sample was taken by E. R. Linkenhoker as the car was being unloaded at the Bureau of Mines testing station at Pittsburgh, Pa., on June 15, 1916.

MARSHALL COUNTY.

MOUNDSVILLE. MOUND MINE.

Analyses 18422 and 18423 (p. 124). Bituminous coal, Fairmont field, from Mound mine, a shaft mine in the Wheeling district, three-fourths mile northeast of Moundsville depot on the Baltimore & Ohio R. R. Coal bed, Pittsburgh; Carboniferous age,

Monongahela formation. Average thickness, 5 feet 6 inches. Bed has a distinct cleat striking north and contains occasional clay veins. The immediate roof is a "draw slate" over which is roof coal and shale with a limestone cap rock; floor, underclay and limestone. Cover at points of sampling about 250 feet. The bed was measured at one point in the mine and two samples were taken by J. W. Paul on January 14, 1914, as described below:

Section of coal bed in Mound mine.

Laboratory No.	18422 and 18423
Roof, "draw slate" and roof coal.	*Ft. in.*
Coal	2 1½
"Sulphur" band	[a] 1
Coal	5
Coal, bony	[a] 1
Coal	2 4
Shale	[a] ½
Coal	5
Shale	[a] ¼
Coal	3
Floor, underclay.	
Thickness of bed	5 9
Thickness of coal sampled	5 6¼

[a] Not included in sample.

Samples 18422 and 18423 were cut from the face of 7 west entry, 2 north entry, about 1 mile north of shaft. They represented opposite quarters of the same gross sample.

The coal is mined by the room-and-pillar system. In 1914 the coal was undercut with electric chain breast machines and broken down with black blasting powder. The machine cuttings were loaded out with the coal. The average output was about 400 tons, 10 per cent of which was shipped as run-of-mine. The remainder was screened over bar screens 12 feet long with 1⅜ and ¾ inch openings. About 38 per cent of the coal going to the screen passed through. Two pickers were employed on the cars. There were two loading tracks with a capacity of 15 empty cars and 20 loaded cars. The coal was all derived from advanced workings. The output was expected to be increased to 600 tons per day.

MINGO COUNTY.[a]

CHATAROY. BUFFALO MINE.

Analyses 17463, 17467, 17468, and 17480 (p. 124). Bituminous coal, Big Sandy field, Norfolk & Western district, from Buffalo mine, a drift mine 1 mile northeast of Chataroy, on north side of Buffalo Creek, on the main line of the Norfolk & Western Ry. Three coal beds are worked at this mine, the Coalburg, Winifrede, and Thacker (Cedar Grove); Carboniferous (Pottsville) age, Kanawha formation. The Coalburg bed lies 80 feet above the Winifrede, which in turn is 275 feet above the Thacker bed. The Coalburg bed averages 5 feet thick; the roof is sandstone, and the floor, clay shale. The Winifrede bed averages 5½ feet thick; the roof is coarse gray sandstone, which stands well; the floor is clay shale. The Thacker bed averages about 3½ feet thick in this vicinity; the roof is clay shale, and the floor, shale. The three beds were sampled by Eugene Stebinger on May 30, 1913, as described on page following.

[a] The coals of this county are described in detail in Report on Logan and Mingo Counties: State Geol. Survey, 1914, pp. 285-735.

Section of Coalburg bed in Buffalo mine.

Laboratory No.	17467	
Roof, sandstone.	*Ft.*	*in.*
Coal, hard and dull, with a few lustrous streaks, blocks fairly well	1	4
Clay, gray		[a] 1
Coal, soft and lustrous, with well-defined rectangular cleavage		6
Clay, gray		[a] 1
Coal, hard and dull, like upper bench		9
Bone		[a] 4
Coal, hard and dull		9
Bone		[a] 2
Coal, soft and lustrous, with well-defined rectangular cleavage	1	0
Floor, clay shale.		
Thickness of bed	5	0
Thickness of coal sampled	4	4

[a] Not included in sample.

Sample 17467 was gathered in 3 left room, main entry, 700 feet from mouth of entry. Sample dry.

The ultimate analysis of a composite sample made by combining sample 17467 with sample 17466 from the same bed in the Howard mine is shown under laboratory No. 17468.

Section of Winifrede bed, Buffalo mine.

Laboratory No.	17463	
Roof, coarse gray sandstone (stands well).	*Ft.*	*in.*
Coal, hard and dull, splinty block, with lustrous streaks	3	1
Coal, bony		[a] 4
Coal, hard, splinty block, like upper bench	2	0
Floor, clay shale.		
Thickness of bed	5	5
Thickness of coal sampled	5	1

[a] Not included in sample.

Sample 17463 was gathered in 1 right room, 12 drift, 500 feet from drift mouth. Sample dry.

The ultimate analysis of a composite sample made by combining sample 17463 with samples 17462 and 17464 from the same bed in the Howard mine is shown under laboratory No. 17465.

Section of Thacker bed, Buffalo mine.

Laboratory No.	17480	
Roof, clay shale.	*Ft.*	*in.*
Coal, soft and lustrous, with fine rectangular cleavage, much softer than any coal in the Winifrede bed	2	7
Clay parting		[a] 4
Coal, like upper bench		[a] 6
Floor, shale.		
Thickness of bed	3	5
Thickness of coal sampled	2	7

[a] Not included in sample.

Sample 17480 was cut from face of prospect entry, 60 feet from drift mouth. Coal was wet and probably slightly weathered.

Average daily output of mine, 700 tons.

Chataroy. Howard Mine.

Analysis 17466 (p. 124). Bituminous coal, Big Sandy field, Norfolk & Western district, from Howard mine, a drift mine on the north side of Buffalo Creek, 2 miles northeast of Chataroy, on the main line of the Norfolk & Western Ry. Coal bed, Coalburg; Carboniferous (Pottsville) age, Kanawha formation. The bed averages 5½

feet thick and lies nearly horizontal. Roof, clay shale. Cover at point of sampling, 200 feet. The bed was sampled by Eugene Stebinger on May 30, 1913, as described below:

Section of Coalburg bed in Howard mine.

	Ft.	in.
Roof, clay shale.		
Coal, hard and dull; blocks well	3	3
Bone		[a] 3
Coal, hard and splinty, more lustrious than top bench, but does not block as well		11
Bone		[a] 1
Coal, soft and lustrous, with minute cleavage		6
Bone		[a] 1
Coal, soft and lustrous, with minute cleavage		7
Floor, not stated.		
Thickness of bed	5	8
Thickness of coal sampled	5	3

[a] Not included in sample.

Sample 17466 was cut in 1 air course, main entry, 700 feet from mine mouth.

The ultimate analysis of a composite sample made by combining sample 17466 with sample 17467 from the same bed in the Buffalo mine is shown under laboratory 17468.

The Winifrede bed is also worked at this mine, but was not sampled. At the date of sampling this mine was equipped for a production of 700 tons per day.

Matewan. Red Jacket, jr., Mine.

Analyses 17474 and 17483 (p. 124). Bituminous coal, Big Sandy field, Norfolk & Western district, from Red Jacket, jr., mine, a drift mine on the north side of Mate Creek, 4 miles northeast of Matewan, on the Norfolk & Western Ry. Two coal beds are worked at this mine, the upper known as the Red Jacket, averaging 4 feet thick, lying 90 feet above the lower, the Thacker, which averages a little less than 4½ feet thick. The beds are of Carboniferous (Pottsville) age, Kanawha formation, and have been correlated by the State geological survey with the Cedar Grove coals in Kanawha County. The beds lie nearly horizontal. Each of the beds has a shale roof and a shale floor. The roof of the Red Jacket bed frequently spalls badly, coming down with the coal. The beds were sampled by Eugene Stebinger on June 2, 1913, as described below:

Section of Red Jacket bed in Red Jacket, jr., mine.

Laboratory No.	17474	
	Ft.	in.
Roof, shale, which spalls badly.		
Coal, soft and lustrous, with poorly developed cleavage and jointing		8
Coal, hard dull splint, with a few lustrous streaks; blocks well	1	8
Coal, bands of dull splint and lustrous coal		3
Coal, bony		2
Coal, soft and lustrous; does not block	1	3
Floor, shale.		
Thickness of bed	4	0
Thickness of coal sampled	4	0

Sample 17474 was taken in 15 left room, main entry, 1,200 feet in on entry. Sample dry.

Section of Thacker bed in Red Jacket, jr., mine.

Laboratory No.	17483	
	Ft.	in.
Roof, clay shale.		
Coal, lustrous, rather soft, with a few dull, hard streaks; blocks poorly	1	4
Coal, hard dull splint		8
Coal, fairly hard and lustrous, with a few dull streaks	2	3
Floor, shale.		
Thickness of bed	4	3
Thickness of coal sampled	4	3

Sample 17483 was taken in 15 left room, main entry, 1,200 feet in on entry. Sample dry.

In 1913 this mine had a capacity of 700 tons daily.

MERRIMAC. WHITE STAR MINE.

Analyses 17472 and 17473 (pp. 124–125). Bituminous coal, Big Sandy field, Norfolk & Western district, from White Star mine, a drift mine on the West Virginia side of Tug Fork River at Merrimac, a station on the main line of the Norfolk & Western Ry. Coal beds known as the Alum and the No. 2 or Gas; Carboniferous (Pottsville) age, Kanawha group. The No. 2 or Gas bed is about 180 feet below the Alum. Each of the beds lies nearly horizontal and has a shale roof and floor. The roof of the Alum bed spalls badly and gives considerable trouble in mining. The beds were sampled by Eugene Stebinger on June 3, 1914, as described below:

Section of Alum bed in White Star mine.

Laboratory No.	17472
	Ft. *in.*
Roof, shale, spalls badly.	
Coal, soft and lustrous; blocks well	1 2
Coal, soft and lustrous, with dull streaks and much "sulphur"	1 3
Coal, lustrous	11
Floor, shale.	
Thickness of coal bed	3 4
Thickness of coal sampled	3 4

Sample 17472 was taken in 3 left entry, main entry, 1,000 feet from entry mouth. Sample dry.

Section of No. 2 or Gas bed in White Star mine.

Laboratory No.	17473
	Ft. *in.*
Roof, shale.	
Coal, hard dull splint	4
Bone, with streaks of lustrous coal	[a] 9
Coal, soft and lustrous; does not block	2 6
Coal, hard dull splint	8
Floor, shale.	
Thickness of bed	4 3
Thickness of coal sampled	3 6

[a] Not included in sample.

Sample 17473 was taken at the face of the main entry, 700 feet from mouth. Sample dry.

In 1913 this mine was equipped to produce 200 tons per day.

WAR EAGLE. MEPHISTO MINE.

Analyses 17478 and 17479 (p. 125). Bituminous coal, Big Sandy field, Norfolk & Western district, from Mephisto mine, a drift mine between Turkey Creek and Fourpole Creek, 3 miles northeast of War Eagle on the Norfolk & Western Ry. Coal bed, known as War Eagle No. 1; Carboniferous (Pottsville) age, Kanawha group. The bed averages a little over 6 feet thick, and lies nearly horizontal. Roof and floor are shale. Cover, about 300 feet. The bed was sampled by Eugene Stebinger on June 6, 1913, as shown on page following.

Section of coal bed in Mephisto mine.

Laboratory No.	17478
Roof, shale.	*Ft. in.*
Coal, soft, laminated, with fine cubic cleavage	2 7
Clay-shale, gray	[a] 6
Coal, hard and dull, with shiny streaks	1 0
Coal, like upper bench	2 0
Floor, shale.	
Thickness of bed	6 1
Thickness of coal sampled	5 7

[a] Not included in sample.

Sample 17478 was taken from face of 2 left air course, 500 feet from mouth.

For an ultimate analysis of a composite sample in which this sample was included see laboratory No. 17479.

In 1913 the mine had a daily capacity of 400 tons.

The ultimate analysis of a composite sample made by combining samples 17476 and 17477 from the Papoose mine with sample 17478 is given under laboratory No. 17479.

WAR EAGLE. PAPOOSE MINE.

Analyses 17476, 17477, and 17479 (p. 125). Bituminous coal, Big Sandy field, Norfolk & Western district, from Papoose mine, a drift mine between Turkey Creek and Fourpole Creek, 2 miles east of War Eagle on the Norfolk & Western Ry. Coal bed, known as War Eagle No. 1; Carboniferous (Pottsville) age, Kanawha formation. The bed is fairly uniform, averaging 6 feet thick and lies nearly horizontal. Roof, shale; floor, a clay that is troublesome. Cover at points of sampling, 200 feet. The bed was sampled by Eugene Stebinger on June 6, 1913, as described below:

Sections of coal bed in Papoose mine.

Section	A	B
Laboratory No.	17476	17477
Roof, shale.	*Ft. in.*	*Ft. in.*
Coal, lustrous, with fine streaks of pyrite	5	.. ..
Clay parting	[a] ½	.. ..
Coal, lustrous, with cubic cleavage	9	.. ..
Coal, iron-gray splint	8	.. ..
Coal, lustrous, with cubic cleavage	9	.. ..
Clay parting	[a] 2	.. ..
Coal, lustrous, with cubic cleavage	2 10	1 1
Coal, dull-gray splint	.. ..	11
Clay parting, gray	.. ..	[a] 5
Coal, lustrous, with cleavage	.. ..	4
Coal, dull-gray splint with lustrous bands	.. ..	9
Coal, lustrous, with cubic cleavage	.. ..	2 7
Floor, clay.		
Thickness of bed	5 7½	6 1
Thickness of coal sampled	5 5	5 8

[a] Not included in sample.

Sample 17476 was taken from 5 left entry, main straight entry, 600 feet in. Sample dry.

Sample 17477 was taken from face of 5 drift, 1,200 feet from mouth. Sample dry.

See analysis No. 17479 for an ultimate analysis of a composite sample in which the above two samples were included.

In 1913 the mine was equipped to produce an average of 400 tons daily.

The ultimate analysis of a composite sample made by combining samples 17476 and 17477 with sample 17478 from the Mephisto mine is given under laboratory No. 17479.

War Eagle. War Eagle Mine.

Analysis 17475 (p. 125). Bituminous coal, Big Sandy field, Norfolk & Western district, from War Eagle mine, a drift mine on the east side of Turkey Creek near its head, 3½ miles northeast of War Eagle, on the Norfolk & Western Ry. Coal bed, War Eagle No. 2; Carboniferous (Pottsville) age, Kanawha formation. The bed averages a little over 6 feet thick and lies nearly horizontal. Roof, shale; floor, shale. Cover at point of sampling, 75 feet. The bed was sampled by Eugene Stebinger on June 6, 1913, as described below:

Section of coal bed in War Eagle mine.

Laboratory No.	17575
	Ft. in.
Roof, shale.	
Coal, lustrous, laminated, with cubic cleavage	7
Coal, lustrous, cubic cleavage, not laminated	7
Coal, dull, fine grained	2 2
Coal, dull, bony	2
Coal, dull, fine grained	2 8
Floor, shale.	
Thickness of bed	6 2
Thickness of coal sampled	6 2

The sample was taken in 1 right room, main entry, 200 feet from mouth.

Williamson. Winifrede Mine.

Analyses 17462, 17465, and 17481 (p. 125). Bituminous coal, Big Sandy field, Norfolk & Western district, from Winifrede mine, a drift mine, on Williamson Creek 1 mile east of Williamson, on the main line of the Norfolk & Western Ry. Coal beds, Winifrede and Thacker (Cedar Grove); Carboniferous (Pottsville) age, Kanawha formation. The Winifrede is about 275 feet above the Thacker bed. The Winifrede bed averages 6 feet thick and has a coarse gray sandstone roof that stands well and a shale floor. The Thacker bed averages 3½ feet thick, and the coal is much softer and more lustrous than the Winifrede coal. Both beds are nearly horizontal. They were sampled by Eugene Stebinger on May 29 and 31, 1913, as described below:

Section of Winifrede coal bed in Winifrede mine.

Laboratory No.	17462
	Ft. in.
Roof, coarse gray sandstone, stands well.	
Coal, hard dull splint, breaks out in large blocks	2 4
Coal, bony	4
Coal, hard splint, rather lustrous in lower half	1 1
Clay parting	[a] 2
Coal, hard dull splint, with lustrous streaks	1 9
Floor, shale.	
Thickness of bed	5 8
Thickness of coal sampled	5 6

[a] Not included in sample.

Sample 17462 was taken 700 feet northeast of the mouth of the main entry.

Section of Thacker bed in Winifrede mine.

Laboratory No	17481
	Ft. in.
Roof, clay shale.	
Coal, soft and dull, with well-developed cleavage	7
Clay parting	[a] ½
Coal, soft and dull, with a few lustrous streaks	2 4
Clay parting	[a] 1
Coal, soft, lustrous	8
Floor, shale.	
Thickness of bed	3 8½
Thickness of coal sampled	3 7

[a] Not included in sample.

Sample 17481 was taken from the working face of a prospect drift being driven on the north slope of a creek opposite the power house, 60 feet from the entrance of the entry. The coal was probably slightly weathered. Sample dry.

The average daily production, all of it from Winifrede bed, at date of sampling was about 800 tons per day.

The ultimate analysis of a composite sample made by combining sample 17462 with samples 17463 (see pp. 124, 125) and 17464 (see p. 125) is shown under laboratory No. 17465.

WILLIAMSON. STERNBERGER MINE.

Analyses 17464 and 17465 (p. 125). Bituminous coal, Big Sandy field, Norfolk & Western district, from Sternberger mine, 1½ miles northeast of Williamson, on the main line of the Norfolk & Western Ry. Coal bed, Winifrede; Carboniferous (Pottsville) age, Kanawha group. Average thickness, 6 feet. The bed was sampled by Eugene Stebinger on May 29, 1913, as described below:

Section of coal bed in Sternberger mine.

Laboratory No.	17464
	Ft. in.
Roof, sandstone.	
Coal, splint	2 7
Coal, bony	3½
Coal, splint	5
Coal, lustrous	7
Clay	[a] 10
Coal, splint	1 6
Coal, lustrous	5
Floor, shale.	
Thickness of bed	6 7½
Thickness of coal sampled	9½

[a] Not included in sample.

Sample 17464 was cut in 2 room, left entry, shop entry, 900 feet from mine mouth. Sample dry.

The ultimate analysis of a composite sample made by combining sample 17464 with samples 17462 (see p. 125) and 17463 (see p. 124) is given under laboratory No. 17465.

NICHOLAS COUNTY.

KIRKWOOD. LOCAL MINE.

Analysis 21819 (p. 125). Bituminous coal, Elk River field, from a local mine at Kirkwood, 16 miles southwest of Camden station, on the Baltimore & Ohio R. R. Coal bed, probably No. 2 or Gas; Carboniferous (Pennsylvanian) age, Kanawha group. Roof, shale; floor, clay. The bed was sampled by E. R. Lloyd on April 8, 1915, as described below:

Section of coal bed in local mine near Kirkwood.

	Ft. in.
Roof, shale.	
Coal	1 5½
Bone	[a] 1
Coal	1 10
Floor, clay.	
Thickness of bed	3 4½
Thickness of coal sampled	3 3½

[a] Excluded from sample.

The sample was taken at the face of the entry, about 60 feet S. 7° E. of mine mouth.

MUDDLETY. LOCAL MINE.

Analysis 21820 (p. 125). Bituminous coal, Elk River field, from a local mine at Muddlety post office, about 20 miles southwest of Camden station on the Baltimore & Ohio R. R. Coal bed, probably No. 1 or Eagle; Carboniferous (Pennsylvanian) age, Kanawha group. Cover at point of sampling, 50 to 75 feet. The bed was sampled by E. R. Lloyd on April 7, 1915, as described below:

Section of coal bed in local mine near Muddlety.

	Ft.	in.
Roof, black shale.		
Coal	1	1
Bone		[a] ½
Coal		[a] 1½
Shale		[a] 5
Coal		6
Bone		[a] 1
Coal	1	4
Shale		[a] 1½
Coal		4½
Floor, clay.		
Thickness of bed	4	1
Thickness of coal sampled	3	3½

[a] Not included in sample.

The sample was cut at face of entry, about 200 feet S. 50° E. of mine mouth.

PUTNAM COUNTY.[a]

BLACK BETSEY. BLACK BETSEY NO. 3 MINE.

Analyses 23641 to 23647 (p. 125). Bituminous coal, Kanawha field, Poca district, from Black Betsey No. 3 mine, a drift mine 2 miles northeast of Black Betsey, on a spur of the Kanawha & Michigan Ry. Coal bed, Pittsburgh or No. 8; Carboniferous age, Monongahela formation. The coal outcrops near the headwaters of Farley Creek, which empties into the Kanawha River at Black Betsey, about 100 feet above the bed of the Kanawha River. Thickness, 4 feet 8 inches to 6 feet 2 inches. Dip, slight and regular, N. 15° E. Several faults have been found in mining and clay veins are numerous. The coal is clean, hard, brittle splint coal, with a bright, black luster. Variable "sulphur" streaks are present occasionally. Roof, blue shale, poor; about 30 inches of top coal is left to support it. Floor is clay, fairly soft, ½ to 1 inch thick. The bed was sampled by D. J. Parker and G. W. Grove on December 21, 1915, as described below:

Sections of coal bed in Black Betsey No. 3 mine.

Section	A		B		C		D		E		F	
Laboratory No.	23641		23642		23643		23644		23645			
	Ft.	in.	Ft.	in.	Ft.	in.	Ft.	in.	Ft.	in.	Ft.	in.
Roof, blue shale.												
Top coal	[a] 2	6	[a] 2	6	[a] 2	6	[a] 2	6	[a] 2	6	[a] 2	6
"Draw slate"		[a] 6		[a] 6		[a] 6		6		[a] 6		[a] 6
Coal, splint	5	3	5	8	5	0	4	9	5	2	4	11
Clay		[a] ¾		[a] ¾		[a] ¾		[a] ¾		[a] ¾		[a] ¾
Bottom coal		[a] 8		[a] 8		[a] 8		[a] 8		[a] 8		[a] 8
Floor, clay.												
Thickness of bed	8	11¾	9	4¾	8	8¾	8	5¾	8	10¾	8	7¾
Thickness of coal sampled	5	3	5	8	5	0	4	9	5	2	4	11

[a] Not included in sample.

Section A (sample 23641) was cut from face of 11 left heading, 3,600 feet S. 10° E. from pit mouth. Section B (sample 23642) was cut from the face of 7 right heading,

[a] The coals of this county are described in detail in Report on Jackson, Mason, and Putnam Counties: State Geol. Survey, 1911, pp. 247-272.

2,500 feet S. 20° E. from pit mouth. Section C (sample 23643) was cut from the face of 6 left heading, 3,350 feet S. 35° E. from pit mouth. Section D (sample 23644) was cut from the face of 5 room, 3 left heading, 3,075 feet S. 45° E. from pit mouth. Section E (sample 23645) was cut from face of 1 left heading, 3,050 feet S. 60° E. from pit mouth. Section F (sample 23646) was cut from face of 24 room, main south heading, 3,250 feet S. 70° E. from pit mouth.

The ultimate analysis of a composite sample made by combining face samples 23641 to 23646 is given under laboratory No. 23647.

The coal is mined by the room-and-pillar system. In 1915 the entire putput was pick mined, and shot down with black blasting powder, fired with squibs by the miners at the end of shift. The wooden tipple, capacity 1,500 tons a day, was equipped with bar screens. Particles of the bottom may become mixed with the coal during mining. Lump and screenings were the two grades usually marketed. Twenty-eight per cent of the coal passed through 1¼-inch screens. Four pickers were employed. The daily output was about 1,200 tons. The life of the mine was estimated to be about 2 years. There was 55 acres unmined. The tracks had a capacity of about 30 empty and 30 loaded cars.

RALEIGH COUNTY.[a]

Eccles. Eccles No. 5 Mine.

Analyses 19774 to 19779 (pp. 125-126). Semibituminous coal, New River field, from Eccles No. 5 mine, a shaft mine at Eccles, on the Virginian R. R. Coal bed, Beckley; Carboniferous (Pottsville) age, Quinnimont formation. Thickness, 4 to 9 feet. Roof, carbonaceous sandstone and massive sandstone; floor, black shale. Bed dips slightly northwest. It was sampled by J. W. Paul on May 23, 1914, as described below.

Sections of coal bed in Eccles No. 5 mine.

Section	A		B		C		D	
Laboratory No.	19774		19775		19776		19778	
Roof, sandstone.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Coal, laminated	..	..	..	..	1	11	..	..
Coal, soft	1	10	..	..	..	..	..	..
Coal, gray, hard		4	..	..		2¾		5
Coal, firm	..	..		8	..	..	1	6
Coal, columnar	2	9	..	..	1	1	..	..
Coal, bony	..	..	..	..	..	..		3
Bone	[a]1	3½	[a]2½		[a]½		..	..
Coal, soft, columnar	1	9	2	3½	1	6	2	10
Bone and "sulphur"	..	..	..	..	..	..		[a]2
Coal, hard, laminated	..	..	..	..		1	..	..
Bone, hard	..	..	[a]10½		..	..	..	..
Coal, soft, columnar	..	..	..	..		11½	1	7
Coal, firm, hard		9	2	2½	..	..		8½
Coal, laminated	..	..	..	..	1	6	..	..
Floor, shale.								
Thickness of bed	8	8½	7	2¾	7	3¾	7	5½
Thickness of coal sampled	7	5	6	2	7	3¾	7	3½

[a] Not included in sample.

Section A (sample 19774) was cut at the face of 12 room, 1 right entry, main east entry (near coal barrier). Section B (sample 19775) was cut from the face of 4 room, 3 left entry, main west entry. Section C (sample 19776) was cut from the face of 14 room, 1 left entry, main east entry. Sample 19777 was cut from the face of 25 room, main south air course. Section D (sample 19778) was cut from the face of 12 room, 2 right entry, main west entry.

[a] The coals of this county are described in detail in Report on Raleigh County and western portions of Mercer and Summers Counties: State Geol. Survey, 1916, pp. 380-650.

The ultimate analysis of a composite sample made by combining samples 19774 to 19778 is given under laboratory No. 19779.

The mine is opened by a shaft 520 feet deep. The room-and-pillar system of mining is used. The mine has triple and double entry systems. In 1914 the coal was undercut with machines and shot down with permissible explosives. The coal has no cleat; faults are seldom found. About 37 per cent of the coal was taken out in advance work. The output averaged 1,300 tons; the maximum day's run was 1,850 tons. There was 1,000 acres still to be mined, and the probable lifetime of the mine was about 50 years. Some of the coal was shipped as "run of mine" and some was screened; 60 per cent passed through a 1-inch screen. The tracks have a capacity of 80 empty and 30 loaded cars.

WYOMING.

CAMPBELL COUNTY.

GILLETTE. COUNTRY BANK.

Analysis 22973 (p. 126). Subbituminous coal, Powder River field, from a country bank in sec. 74, T. 46 N., R. 74 W., about 40 miles southwest of Gillette. Coal bed, not named; Tertiary age, Wasatch (?) formation. Thickness, about 6 feet. Roof is white sandstone; floor is gray shale 18 feet thick. Beneath this shale was another coal bed 3 feet 8½ inches thick. Cover at point of sampling, 15 feet. The bed was sampled by R. Leibensperger on September 24, 1915, as described below:

Section of coal bed in country bank, in sec. 74, T. 46 N., R. 74 W.

	Ft.	in.
Roof, white sandstone (15 feet).		
Coal	1	6
Shale, gray		1
Coal	2	6
Shale, gray		1
Coal	1	1
Floor, gray shale.		
Thickness of bed	6	1
Thickness of coal sampled	6	1

GILLETTE. LOCAL MINE.

Analysis 22885 (p. 126). Subbituminous coal, Powder River field, from a local mine in T. 45 N., R. 73 W., about 40 miles south of Gillette on the Chicago, Burlington & Quincy R. R. Coal bed, "B"; Tertiary age, Wasatch formation. The bed was sampled September 11, 1915, by R. W. Howell, as shown below:

Section of coal bed 40 miles south of Gillette.

	Ft.	in.
Coal	[a]2	7
Parting		[a]1
Coal	6	0
Parting		[a]1+
Coal (base not exposed).		
Thickness of bed measured	8	9+
Thickness of coal sampled	6	0

[a] Not included in sample.

The sample was weathered.

GILLETTE. PROSPECT.

Analysis 22904 (p. 126). Subbituminous coal, Powder River field, from a prospect in sec. 52, T. 44 N., R. 73 W., about 45 miles south of Gillette on the Chicago, Burling-

ton & Quincy R. R. Coal bed, "A" (?); Tertiary age, Wasatch formation. The bed was sampled August 30, 1915, by R. W. Howell. The sample was weathered and was taken from a coal bed 7 feet 8 inches thick.

CARBON COUNTY.

Hanna. Local Mine.

Analysis 22972 (p. 126). Subbituminous coal, Hanna field, from a local mine in sec. 11, T. 24 N., R. 83 W., about 20 miles northwest of Hanna on the Union Pacific R. R. Coal bed, not named; Cretaceous age, Lower Laramie formation. Thickness, 6 feet. Roof, sandy shale; floor, carbonaceous shale. The bed was sampled September 25, 1915, by H. M. Robinson. The sample was taken in the mine 210 feet N. 12° W. of the mine mouth and represented 5 feet 11 inches of coal. There was 1 inch of bone below the coal.

For geologic relations of this coal, see U. S. Geol. Survey Bull. 316, 1907, pp. 244–260.

Medicine Bow. Johnson Mine.

Analysis 22800 (p. 126). Subbituminous coal, Hanna field, Carbon Basin, from Johnson mine, in sec. 5, T. 20 N., R. 79 W., about 18 miles southwest of Medicine Bow on the Union Pacific R. R. Coal bed, unnamed; Tertiary age, Upper Laramie formation. The bed was sampled August 30, 1915, by C. F. Bowen, as shown below:

Section of coal bed in Johnson mine.

	Ft.	in.
Roof, shale.		
Coal		[a] 4
Bone		[a] 4
Coal		[a] 10
Coal, bony		[a] 1
Coal	2	0
Coal, bony		[a] 4
Coal	3	5
Floor, shale.		
Thickness of bed	7	4
Thickness of coal sampled	5	5

[a] Not included in sample.

The sample was taken at face of south entry, 85 feet from mine mouth.

For geologic relations of this coal, see U. S. Geol. Survey Bull. 316, 1907, pp. 244–260.

Rock River. King Mine.

Analysis 22792 (p. 126). Subbituminous coal, Laramie Basin field, from King mine, in sec. 7, T. 19 N., R. 77 W., about 14 miles southwest of Rock River, on the Union Pacific R. R. Coal bed, unnamed; Cretaceous age, Mesaverde formation. The bed was sampled on August 26, 1915, by C. F. Bowen, as shown below:

Section of coal bed in King mine.

	Ft.	in.
Roof, carbonaceous shale.		
Coal	[a] 2	0
Shale		[a] 6
Coal (sampled upper 3 feet)	5	0
Shale, gray	[a] 1	8
Coal	[a] 1	11
Coal, bony		[a] 1½
Coal		[a] 10
Coal, bony		[a] 3
Coal	[a] 1	0
Shale	[a] 1	4
Coal	[a] 2	6
Shale and bone		[a] 6
Coal		[a] 10
Floor, sandstone.		
Thickness of bed	18	5½
Thickness of coal sampled	5	0

[a] Not included in sample.

The sample, which was weathered, was taken 25 feet from mine mouth.

For geologic relations of this coal see U. S. Geol. Survey Bull. 364, 1909, p. 51.

CONVERSE COUNTY.

Big Muddy. Big Muddy Mine.

Analyses 17722 and 17723 (p. 127). Subbituminous coal, Glenrock field, from Big Muddy mine, a slope mine in SE. ¼ sec. 26, T. 34 N., R. 77 W., at Big Muddy, one-half mile north of the Chicago & North Western and the Butte & Montana R. R. Coal beds, Upper Big Muddy and Lower Big Muddy; Tertiary (?) age, Lance formation. Each of the beds is about 4 to 4½ feet thick. The distance between the Upper and Lower beds is 29 feet. Roof and floor of both beds are shale. Cover at point of sampling: Upper bed about 40 feet, Lower bed about 30 feet. Each bed was sampled at one point by J. B. Reeside, jr., on September 12, 1913. Sample 17722 was taken from the Upper Big Muddy bed 300 feet down the slope and represented 4 feet of coal. There was 1 inch of bone below the coal sampled. The slope opening is in the SE. ¼ sec. 26. Sample 17723 was taken from the Lower Big Muddy bed, 40 feet from the mouth of an unused slope. It represented 4 feet 3 inches of coal, the thickness of the bed. This slope is in the NW. ¼ sec. 36.

For geologic relations of this coal see U. S. Geol. Survey Bull. 341, 1907, pp. 151–164.

Glenrock. Fairview Mine.

Analysis 17657 (p. 127). Subbituminous coal, Glenrock field, from Fairview mine, a shaft and slope mine in NE. ¼ sec. 5, T. 33 N., R. 75 W., near the railroad station at Glenrock, on the Chicago & North Western Ry. Coal bed, not named; Tertiary (?) age, Lance formation. Dip, 6° NE. Roof, shale; floor, sandy shale. Thickness, 6½ feet. The bed was sampled by J. B. Reeside, jr., on August 15, 1913, as described below:

Section of coal bed in Fairview mine.

	Ft.	*in.*
Roof, shale:		
Coal	1	4
Shale		[a]2
Coal	5	0
Floor, sandy shale.		
Thickness of bed	6	6
Thickness of coal sampled	6	4

[a] Not included in sample.

The sample was taken in the mine, 200 feet northeast of shaft.

The mine was opened in August, 1912. Three hundred feet down the slope there are two side headings from which a small amount of coal, mostly for local consumption has been taken. Daily output, 20 tons.

For geologic relations of this coal see U. S. Geol. Survey Bull. 341, 1907, pp. 151–164.

Glenrock. Glenrock Mine.

Analysis 17658 (p. 127). Subbituminous coal, Glenrock field, from Glenrock mine, a drift mine one-fourth mile east of Glenrock in NE. ¼ SW. ¼ sec. 4, T. 33 N., R. 75 W., on the Chicago & North Western Ry. Coal bed not named; Tertiary (?) age, at base of Lance formation. Roof and floor, shale. In mining, the top part of the bed is left up for roof. The bed was sampled by J. B. Reeside, jr., on August 15, 1913, as described on page following.

Section of coal bed in Glenrock mine.

	Ft.	in.
Roof, shale.		
Coal	[a]	11
Bone	[a]	4
Shale	[a]	2
Coal	5	4
Floor, shale.		
Thickness of bed	6	9
Thickness of coal sampled	5	4

[a] Not included in sample.

The sample was taken in mine, 75 feet N. 34° E. of main opening, from a 64-inch bench, which was partly worked. The mine was not timbered and is very dry. The mine was producing little coal at the time of sampling.

For geologic relations of this coal see U. S. Geol. Survey Bull. 341, 1907, pp. 151–164.

GLENROCK. PROSPECT.

Analysis 17902 (p. 127). Subbituminous coal, Glenrock field, from a prospect slope 2 miles south of Glenrock, in SE. ¼ sec. 9, T. 33 N., R. 75 W., on the Chicago & North Western Ry. and the Chicago, Burlington & Quincy R. R. Coal bed, not named; Upper Cretaceous age, "Fox Hills" formation. Roof, shale and sandstone; floor, shale. The bed was sampled October 15, 1913, by J. B. Reeside, jr. The sample was taken 40 feet from the slope mouth and represented 3 feet of coal. There was 4 inches of bone above the coal.

For geologic relations of this coal see U. S. Geol. Survey Bull. 341, 1907, pp. 151–164.

FREMONT COUNTY.

DUBOIS. PROSPECT.

Analysis 17584 (p. 127). Subbituminous coal, Lander field, from a prospect drift in sec. 25, T. 42 N., R. 108 W., 8 miles northwest of Dubois and 60 miles northwest of Lander, on the Chicago & North Western Ry. Coal bed, not named; Tertiary age, Wind River (?) formation. Roof and floor are clay shale. The bed was sampled by D. D. Condit on July 19, 1913, as described below:

Section of coal bed in prospect, 8 miles northwest of Dubois.

	Ft.	in.
Roof, clay shale.		
Clay, with lenses of coal	[a] 2	6
Coal	[a]	3
Clay	[a] 1	5
Coal		10
Shale, gypsiferous	[a]	½
Coal	1	1
Coal, bony	[a]	2
Coal		7¼
Clay	[a] 1	7
Coal	[a]	6½
Clay	[a]	4
Coal	[a]	2½
Clay	[a]	4
Coal	[a]	5½
Floor, clay shale.		
Thickness of bed	10	4½
Thickness of coal sampled	2	6¼

[a] Not included in sample.

The sample was taken in the drift 10 feet from the mouth. The coal was wet and weathered. The area of workable coal is probably less than 3 acres. The drift extended about 15 feet into the hill.

HUDSON. MCKINLEY MINE.

Analyses 21408 to 21411 (p. 127). Subbituminous coal, Wind River field, from McKinley mine, a slope mine, in sec. 2, T. 2 S., R. 2 E., 2 miles northeast of Hudson on spur of the Chicago & North Western Ry. Coal bed, locally called Mesa Verde; Cretaceous age, Mesaverde formation. Thickness, 4 feet 6 inches. Roof, shale and conglomerate; floor, hard sandstone. Dip, 8° to 14° NE. The bed was sampled by J. C. Roberts on February 17, 1915, as described below:

Sections of coal bed in McKinley mine.

Section	A	B	C
Laboratory No.	21408	21409	21410
Roof, shale and conglomerate.			
Coal	Ft. 4 in. 3	Ft. .. in. ..	Ft. 5 in. 0
Coal	.. ..	a 6	.. ..
Shale	.. ..	a 6	.. ..
Coal	.. ..	4 6	.. ..
Floor, hard sandstone.			
Thickness of bed	4 3	5 6	5 0
Thickness of coal sampled	4 3	4 6	5 0

a Not included in sample.

Section A (sample 21408) was cut at face of 3 room, 75 feet from slope. Section B (sample 21409) was cut at a point 500 feet from pit mouth. Section C (sample 21410) was cut at face of 1 room, 50 feet from entry.

An ultimate analysis of a composite sample made by combining face samples 21408, 21409, and 21410 is given under laboratory No. 21411.

The room-and-pillar system of mining is used. In 1915 all the coal was taken out in advance work, no pillars being pulled. The coal was undercut by hand and was shot down with black blasting powder. All of the coal was sold as run of mine.

For geologic conditions of coal at Hudson see U. S. Geol. Survey Bull. 471, 1912, pp. 544–548.

HOT SPRINGS COUNTY.

KIRBY. GEBO MINE.

Analyses 24447 to 24452 (p. 127). Subbituminous coal, Bighorn Basin field, from Gebo mine, a slope mine 2 miles southwest of Kirby in S. ½ sec. 11, T. 44 N., R. 95 W., on a spur of the Chicago, Burlington & Quincy R. R. Coal bed, Gebo; Cretaceous age, Eagle sandstone. Average thickness 10 feet 8 inches; dip, 20½° N. 24° E.; cleat, N. 57° E. No faults, rolls, or horsebacks have been encountered. Roof is clay and shale, with sandstone cap rock; floor is hard, smooth, dark fire clay. Particles of roof and floor seldom become mixed with the coal in mining. Cover at points of sampling, 200 to 500 feet. The bed was sampled by Daniel Harrington on March 6, 1916, as described below:

Sections of coal bed in Gebo mine.

Section	A	B	C	D	E
Laboratory No.	24447	24448	24449	24450	24451
Roof, coal.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal	a 2 6	a 2 6	a 2 0	.. ..	a 2 6
Brownish-gray clay parting	b 1	b 1½	b 1	.. ..	b 1½
Coal	9 1	9 3	8 10	8 4	9 3
Floor, gray-black clay.					
Thickness of bed	11 8	11 10½	10 11	8 4	11 10½
Thickness of coal sampled	9 1	9 3	8 10	8 4	9 3

a Estimated, not included in sample. b Not included in sample.

Section A (sample 24447) was measured at face of 3 east back entry, 325 feet east of 5 dip butt, 2 east entry. Section B (sample 24448) was measured at face of 6

butt, 12 feet south of 2 east entry, near west rib, about 3,600 feet from mine mouth. Section C (sample 24449) was measured about 5 feet back of face of 4 west main entry, about 275 feet west of 2 butt, 3,000 feet from mine mouth. Section D (sample 24450) was measured at face of 3 west main entry, 3,200 feet from mine mouth. Section E (sample 24451) was measured 12 feet south of 2 east entry, near east rib, at face of 6 butt, about 3,600 feet from mine mouth.

An ultimate analysis of a composite sample made by combining face samples 24447 to 24451 is given under laboratory No. 24452.

The coal is mined by the room-and-pillar, butt-entry, or panel system. In 1916 it was undercut by electric chain machines and compressed-air punching machines, and was broken down with permissible explosives. The machine cuttings were loaded out with the coal. About 12 per cent of the coal was shipped as run-of-mine. The tipple was equipped with a shaking screen 7 feet wide and 42 feet long, 15 feet having 1-inch holes; 4 feet, 1¼-inch holes; 4 feet, 2½-inch holes; 4 feet, 5-inch holes; 4 feet, 8-inch holes; and a ⅜-inch screen for slack. No pickers were employed on the cars or belts. The lumps were large and had a good appearance. There were four loading tracks with a capacity of 75 empty cars and 75 loaded cars. The daily output was 1,400 tons. Approximately 1,000 acres remained to be taken out. The mine was expected to have a lifetime of about 50 years. The future tonnage was to be derived almost wholly from advance workings.

For descriptions and analyses of other samples of coal from this mine see Bureau of Mines Bull. 85, pp. 136, 137, 395, 396.

For geologic relations of this coal see U. S. Geol. Survey Bull. 341, 1907, pp. 206–207.

Kirby. Gwynn Prospect.

Analysis 17830 (p. 127). Subbituminous coal, Bighorn Basin field, from Gwynn prospect, near Spring Gulch, 4 miles southwest of Grass Creek Basin, in sec. 1, T. 45 N., R. 99 W., 34 miles northwest of Kirby, a station on the Chicago, Burlington & Quincy R. R. Coal bed, "B"; Tertiary age, Fort Union formation. Dip 6° E. The bed was sampled by D. F. Hewett on September 15, 1913, as described below:

Section of coal bed in Gwynn prospect.

	Ft.	*in.*
Roof, not stated.		
Coal	[a]1	2
Shale	[a]0	6
Coal	[a]0	2
Shale	[a]0	1
Coal	[a]0	1
Shale	[a]0	5
Coal	4	0
Shale	[a]1	6
Coal	[a]0	4
Floor, not stated.		
Thickness of bed	8	3
Thickness of coal sampled	4	0

[a] Not included in sample.

The sample was taken from the face of an irregular room, 30 feet west of a point 40 feet south of the entrance. The coal was unweathered. The prospect was operated intermittently.

Thermopolis. Berry Brothers Prospect.

Analysis 17731 (p. 127). Subbituminous coal, Bighorn Basin field, from Berry Brothers prospect, a prospect drift on the east side of a deep ravine north of Owl Creek in SE. ¼ sec. 29, T. 44 N., R. 98 W., 36 miles northwest of Thermopolis, a station on the Chicago, Burlington & Quincy R. R. The prospect is several years old and no coal is mined. Coal bed, not named; Cretaceous age, Gebo (Eagle) formation. Dip, 10° N. The sample was cut by D. F. Hewett on August 27, 1913, as described on page following.

Section of coal bed in Berry Brothers prospect.

	Ft.	in.
Roof, not stated.		
Coal		a 3
Shale		a 2
Coal		a 4
Shale		a 2
Coal	2	11
Floor, not stated.		
Thickness of bed	3	10
Thickness of coal sampled	2	11

a Not included in sample.

The sample was taken from the south rib of the main entry, 40 feet from the opening. The drift was 60 feet long. The coal was weathered.

THERMOPOLIS. PUTNEY MINE.

Analysis 17709 (p. 127). Subbituminous coal, Bighorn Basin field, from Putney mine, a drift mine on the north side of Cottonwood Creek, in SE. ¼ sec. 24, T. 44 N., R. 99 W., 42 miles northwest of Thermopolis, a station on the Chicago, Burlington, & Quincy R. R. Coal bed, Putney; Cretaceous age, Gebo (Eagle) formation. Dip 6° NE. The bed was sampled by D. F. Hewett, on August 27, 1913, as described below:

Section of coal bed in Putney mine.

	Ft.	in.
Roof, not stated.		
Coal	1	1
Coal, bony		3
Coal	2	1
Shale		a 1
Coal		a 4
Shale		a 3
Coal		a 6
Floor, not stated.		
Thickness of bed	4	7
Thickness of coal sampled	3	5

a Not included in sample.

The sample was taken from face of room, 70 feet S. 65° W. of a point in main entry 80 feet from mouth.

LINCOLN COUNTY.

KEMMERER. KEMMERER NO. 6 MINE.

Analyses 18608 to 18612 and 18783 (p. 128). Bituminous coal, Green River field, from Kemmerer No. 6 mine, 7 miles north of Kemmerer. Coal bed, not named; Cretaceous age, Mesaverde formation. Average thickness, 6½ feet. Roof, black shale; floor, soft clay and sandy shale. The bed was sampled by G. W. Salisbury on February 6 and 7, 1914, as described below:

Sections of coal bed in Kemmerer No. 6 mine.

Section	A	B	C	D	E
Laboratory No.	18608	18609	18610	18611	18783
	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Roof, black shale					
Coal, bright	1 2	2	-- --	-- --	-- --
Clay, soft	a 6	a 1½	a 2¾	a 3	a 3
Coal, bright	-- --	2	3 2½	2 9	2 9
Clay, soft, with coal streaks	a 4	a 2	-- --	-- --	-- --
Coal	3 8	1	-- --	-- --	-- --
Shale	a 1¾	a½	a 2	a 4	a 4
Coal	2 2	[illegible]	2 ¼	1 6½	1 6½
Clayey shale	-- --	a 2½	-- --	-- --	-- --
Coal, dirty	-- --	a 3½	-- --	-- --	-- --
Floor, clay and sandy shale.					
Thickness of bed	7 11¾	5 5	5 7½	4 10½	4 10½
Thickness of coal sampled	7 0	4 7	5 2¾	4 3½	4 3½

a Not included in sample.

Section A (sample 18608) was cut from lower rib, 15 feet from face of 3 south entry. Section B (sample 18609) was cut from upper rib, 10 feet from face of 2 south entry. Section C (sample 18610) was cut from upper rib, 10 feet from face of 2 north entry. Section D (sample 18611) was cut from upper rib at face of 3 north entry.

The ultimate analysis of a composite sample made by combining equal amounts of samples 18608, 18609, 18610, and 18611 is given under laboratory No. 18612.

The bed was also measured and sampled by G. W. Salisbury on February 7, 1914. The sample (No. 18783) was cut from upper rib, 3 north entry, 5 feet from face.

NATRONA COUNTY.

CASPER. CASPER PROSPECT.

Analysis 17778 (p. 128). Subbituminous coal, Glenrock field, from Casper prospect, an abandoned mine in SE. ¼ sec. 22, T. 33 N., R. 78 W., 7 miles southeast of Casper. No railroad connections. Coal bed, not named; Upper Cretaceous age, Mesaverde formation. Thickness, 2 feet. Roof, sandy shale; floor, shale. Sample 17778 was taken by J. B. Reeside, jr., on September 22, 1913, at a point 40 feet from mouth of the entry. The sample represented 2 feet of dry, possibly weathered, coal. The coal was underlain by 3 inches of bone. The entry was driven about 50 feet into the hill.

For geologic relations of this coal see U. S. Geol. Survey Bull. 341, 1907, pp. 151-164.

CASPAR. PROSPECT.

Analysis 17895 (p. 128). Subbituminous coal, Glenrock field, from a prospect in SW. ¼ sec. 13, T. 36 N., R. 79 W., about 5 miles north of Casper and the Chicago & North Western Ry. and the Chicago, Burlington & Quincy R. R. Coal bed, not named; Tertiary age, Lance formation. Thickness, 27 inches. Roof, sandstone; floor, shale. The bed was sampled by J. B. Reeside, jr., on October 12, 1913, as described below:

Section of coal bed in prospect 5 miles north of Casper.

	Ft.	in
Roof, sandstone.		
Bone		½
Coal	2	3
Bone		[a]5
Floor, shale.		
Thickness of bed	2	8½
Thickness of coal sampled	2	3½

[a] Not included in sample.

The sample was taken on fresh face about 20 feet from mouth of prospect entry.

For geologic relations of this coal see U. S. Geol. Survey Bull. 341, 1907, pp. 151–164.

SHERIDAN COUNTY.

ACME. ACME NO. 1 MINE.

Analyses 25199, 25217 to 25223, and 25255 to 25258 (pp. 128–129). Subbituminous coal, Sheridan field, from Acme No. 1 mine, at Acme, on the main line of the Chicago, Burlington & Quincy R. R. Coal bed, Carney; Tertiary age, Fort Union formation. Thickness, 6½ to 8 feet; dip, 3° SE. The bed extends in gentle anticlinal and synclinal folds. There is 30 to 40 feet of overburden, of which 4 to 10 feet is stratified coal, sandstone, and shale lying directly over the coal; the rest is soil. Under the coal there is about 20 feet of black shaly clay. The bed was sampled by H. J. Rahilly on May 5 and May 20, 1916, as described below:

Sample 25199 was measured on rib in 5 room, 2 north entry, 5 west entry, 1,600 feet northwest of pit mouth, and represented 8 feet 1 inch of coal. Sample 25217 was measured at face of 8 south entry, 8 west entry, 3,800 feet from pit mouth, and represented 6 feet 9 inches of coal. Sample 25218 was measured at face of 2 room, 4 north

entry, 5 west entry, 1,500 feet from pit mouth, and represented 7 feet of coal. Sample 25219 was measured at face of 1 room, 1 north entry, 4 east entry, 1,000 feet from pit mouth, and represented 7 feet 10 inches of coal. Sample 25220 was measured at face of 10 room, 4 east entry, 1,200 feet from pit mouth, and represented 6 feet 9 inches of coal. Sample 25221 was measured at face of 2 room, 6 north entry, 8 west entry, 4,000 feet from pit mouth, and represented 6 feet 9 inches of coal. Sample 25222 was measured at face of 3 room, 4 south entry, 8 west entry, 3,000 feet from pit mouth, and represented 7 feet 6 inches of coal. Sample 25223 was measured at face of 10 room, 4 north entry, 5 west entry, 1,800 feet from pit mouth, and represented 8 feet 6 inches of coal. Sample 25255 was measured on rib in 8 west entry, main entry, 2,500 feet from pit mouth, and represented 7 feet 1 inch of coal. Sample 25256 was measured on rib of main slope, 1,700 feet from pit mouth, and represented 8 feet of coal. Sample 25257 was measured on rib of main entry, 2,000 feet from pit mouth, and represented 6 feet 6 inches of coal. Sample 25258 was measured on rib, 500 feet in 8 west entry, 3,000 feet from pit mouth, and represented 7 feet of coal.

An ultimate analysis of a composite sample made by combining samples 25199, 25217 to 25223, and 25255 to 25258 is given under laboratory No. 25224.

The room-and-pillar system of mining is used. In 1916 the coal was undercut with machines and broken down with black blasting powder. About half of the output was shipped as run of mine and about 10 per cent was disposed of as screenings. The coal was clean and had a tendency to slack. The loading track had a capacity of 30 cars. The output was about 1,000 tons per day.

For analyses and descriptions of other samples of coal from this mine, see Bureau of Mines Bull. 85, pp. 139, 403, 404.

For geologic relations of this coal see U. S. Geol. Survey Bull. 341, 1907, pp. 123–150.

Carneyville. Carney Nos. 1 and 2 Mines.

Analyses 25197, 25198, 25295 to 25298, and 25304 to 25307 (p. 129). Subbituminous coal, Sheridan field, from Carney No. 1 and Carney No. 2 mines, two drift mines in the same bed, near Carneyville, about one-half mile from Alger, on the Chicago, Burlington & Quincy R. R. Coal bed, Carney; Tertiary age, Fort Union formation. Thickness ranges from 16 to 18 feet, 8 to 12 feet of which is mined. Dip, 1° to 2° SE. The coal is mined to a clay parting 1½ to 6 inches thick, which in some places is rather soft and in falling becomes mixed with the coal. Above the parting is 4 to 4½ feet of coal of good grade; it makes an excellent roof, and no timbering is required in the rooms or entries. Above this roof coal is 12 to 14 inches of clay shale, which falls easily. Floor is rather smooth, soft underclay. In places where a streak of bony coal 2 to 6 inches thick appears at the bottom of the bed next to the underclay, the undercutting was done above it. The cover ranges from 200 to 225 feet. The bed was sampled by H. J. Rahilly on May 5 and 28, 1916, as described below:

All the samples except No. 25197 were taken from the Carney No. 1 mine. Sample 25197 was measured on rib, 50 feet in, in entry stump, 2 east entry, 900 feet from pit mouth, and represented 12 feet 8 inches of coal. Sample 25198 was measured at face of 1 room, 1 north entry, 2 east entry, 1,900 feet from pit mouth, and represented 11 feet 2 inches of coal. Sample 25295 was measured at face of right main parallel entry, 5,300 feet from pit mouth, and represented 9 feet 6 inches of coal. Sample 25296 was measured at face of 14 room, 1 north entry, 4 west entry, 2,500 feet from pit mouth, and represented 9 feet 10 inches of coal. Sample 25297 was measured at face of 15 room, 2 north entry, 2 east entry, 1,800 feet from pit mouth, and represented 9 feet 2 inches of coal. Sample 25298 was measured at face of 1 room, 4 north entry, 4 west entry, 3,000 feet from pit mouth, and represented 9 feet 3 inches of coal. Sample 25304 was measured on rib of 3 west entry, 25 feet inby 6 north entry, 2,400 feet from pit mouth, and represented 8 feet of coal. Sample 25305 was measured on rib of main entry, 25 feet outby 1 east entry, 1,000 feet from pit mouth, and represented 8 feet 1 inch of coal. Sample 25306 was measured on rib of main entry, 600 feet from

pit mouth, and represented 8 feet 2 inches of coal. Sample 25307 was measured on rib of 3 west entry, 25 feet inby 4 north entry, 1,900 feet from pit mouth, and represented 9 feet 8 inches of coal.

An ultimate analysis of a composite sample made by combining samples 25295 to 25298, and 25304 to 25307, is given under laboratory No. 25299.

The coal is mined by the room-and-pillar panel system. In 1916 the coal was undercut with chain breast machines in the bottom part of the bed and shot down with black powder. About 22 per cent of the coal was shipped as run of mine, and about 68 per cent of the coal screened passed through the screens. The loaded lumps were medium large, and had a good appearance on the cars. Three loading tracks were available, with a capacity of 160 loaded cars and 160 empty cars. About 1,000 acres remained to be mined. Average daily output was about 3,500 tons.

For analyses and descriptions of other samples of coal from this mine, see Bureau of Mines Bull. 85, 1914, pp. 140, 141, 405, 406.

For geologic relations of this coal see U. S. Geol. Survey Bull. 341, 1907, pp. 123–150.

Carneyville. Model Mine.

Analyses 25187, 25188, 25226, 25227, and 25189 (p. 129). Subbituminous coal, Sheridan field, from Model mine, near Carneyville, on the Chicago, Burlington & Quincy R. R. Coal bed, known as Carney; Tertiary age, Fort Union formation. The bed is about 15 feet thick; in mining about 5 feet of coal is left up for roof. Dip, 1° to 2° SE. Floor, clay. Cover at point of sampling, 140 to 150 feet. The bed was sampled May 7 and 22, 1916, by H. J. Rahilly, as described below:

Sections of coal bed in Model mine.

Section	A	B	C	D
Laboratory No.	25187	25188	25226	25227
Roof, coal.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Shale, carbonaceous	[a] 1	[a] 1	.. ..	.. ..
Clay	.. ..	.. ..	[a] 2	[a] 4
Coal	9 8	9 4	9 5	8 10
Coal	.. ..	.. ..	[a] 1 0	[a] 1 0
Floor, clay.				
Thickness of bed	9 9	9 5	10 7	10 2
Thickness of coal sampled	9 8	9 4	9 5	8 10

[a] Not included in sample.

Section A (sample 25187) was cut at face of 14 room, 1 west entry, 900 feet northwest of shaft. Section B (sample 25188) was cut at face of 3 room, 2 west entry, 500 feet southwest of shaft. Section C (sample 25226) was cut at face of north entry, 700 feet from shaft. Section D (sample 25227) was cut at face of 1 east entry, 200 feet from shaft.

The ultimate analysis of a composite sample made by combining samples 25187, 25188, 25226, and 25227 is given under laboratory No. 25189.

The shaft is 140 feet deep. The coal is mined by the room-and-pillar system. In 1916 the coal was undercut with machines and shot down with black powder. There were two loading tracks with a capacity of 25 loaded and 20 empty cars. The output was 250 tons per day. The mine is new.

For geologic relations of this coal see U. S. Geol. Survey Bull. 341, 1907, pp. 123–150.

Dietz. Dietz No. 7 Mine.

Analyses 25200, 25202, 25203, and 25289 to 25294 (pp. 129–130). Subbituminous coal, Sheridan field, from Dietz No. 7 mine, a slope mine at Dietz on the Chicago, Burlington & Quincy R. R. Coal bed, known as Dietz No. 7; Tertiary age, Fort Union formation. The thickness of the coal mined averages 5 to 6 feet. Above the coal mined is a shale parting 2 to 4 inches thick, overlain with bony coal, above which is gray

shale. The floor in the mine is coal and clay, particles of which mix with the coal in mining. The bed is practically horizontal, and few faults, rolls, or horsebacks are encountered. Cover at the point of sampling about 300 feet. The bed was sampled by H. J. Rahilly on May 8 and 28, 1916, as described below:

Section A (sample 25200) was cut at face of 2 room, 5 west entry 1,800 feet from pit mouth, and represented 5 feet 9 inches of coal. Section B (sample 25202) was cut at face of 11 room, 2 east entry, 1,700 feet from pit mouth, and represented 6 feet of coal. Section C (sample 25289) was cut at face of 9 room, 1 east entry, 1,800 feet from pit mouth, and represented 4 feet 10 inches of coal. Section D (sample 25290) was cut at face of 15 room, 1 west entry, 1,600 feet from pit mouth, and represented 5 feet 8 inches of coal. Section E (sample 25291) was cut at face of main north entry, 2,600 feet from pit mouth, and represented 6 feet 4 inches of coal. Section F (sample 25292) was cut at face of 15 room, 2 east entry, 1,900 feet from pit mouth, and represented 5 feet 8 inches of coal. Section G (sample 25293) was cut at face of 13 room, 6 west entry, 1,900 feet from pit mouth, and represented 6 feet of coal. Section H (sample 25294) was cut at face of 5 room, 2 west entry, 1,300 feet from pit mouth, and represented 6 feet 8 inches of coal.

The ultimate analysis of a composite sample made by combining face samples 25200, 25202, 25289 to 25294 is given under laboratory No. 25203.

The mine is worked by the double-entry, room-and-pillar system. In 1916 part of the coal was undercut by hand and part was shot off the solid. When undercut the cuttings were loaded with the coal. The coal was shot down with black blasting powder. None of the coal was shipped as run of mine, but it was all screened. No pickers were employed. The lump coal had a firm and fairly clean appearance on the cars and was medium large. The coal screenings were fairly clean and of good size. The daily output in 1916 was 1,000 tons.

For geologic relations of this coal see U. S. Geol. Survey. Bull. 341, 1907, pp. 123-150.

Kooi. Kooi Mine.

Analyses 25263 to 25274 (p. 130). Subbituminous coal, Sheridan field, from Kooi mine, opened by a slope, at Kooi, near Alger, and in sec. 23, T. 57, R. 85 W., on a short branch line from the Chicago, Burlington & Quincy R. R. Coal bed, known as Monarch; Tertiary age, Fort Union formation. Average thickness 8½ to 10 feet. There is a persistent streak of bony coal in this bed that varies from 2 to 4 inches thick in parts of the mine, and runs as high as 8 to 10 inches in other parts. There is all over the mine a definite carbonaceous shaly clay parting 2 to 4 inches thick, which occurs 8 to 10 feet from the floor. Above this parting is good coal roof 4 or 5 feet thick, above which is a series of alternate layers of "shaly" coal and shale. The floor is light-gray, hard, tough clay over 6 feet thick at points. A streak of bony coal 6 to 8 inches thick is sometimes found on top of the clay and at the bottom of the coal bed. The machine cut is made on top of this when necessary. Cover, 50 to 100 feet; dip, 1° S. 4° E., with a pronounced east and west cleat. The bed was sampled by H. J Rahilly on May 2 and 19, 1916, as described below:

Sections of coal bed in Kooi mine.

Section	A	B	C	D	E	F
Laboratory No.	25263	25264	25265	25266	25267	25268
Roof, coal and shale.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Carbonaceous shale	[a] 2	[a] 4	[a] 4	[a] 1	[a] 4	[a] 4
Coal	9	11	8 1	8 1	9 0	8 2
Bone	[a] 4	[a] 4	.. ..	.. ..	.. ..	.. ..
Coal	7 9	7 2	.. ..	.. ..	.. ..	.. ..
Floor, clay.						
Thickness of bed	9 0	8 9	8 5	8 2	9 4	8 6
Thickness of coal sampled	8 6	8 1	8 1	8 1	9 0	8 2

[a] Not included in sample.

Sections of coal bed in Kooi mine—Continued.

Section	G	H	I	J	K
Laboratory No.	25269	25270	25271	25272	25273
Roof, coal and shale.					
Shale	*Ft. in.* [a] 2	*Ft. in.* [a] 3	*Ft. in.* [a] 2	*Ft. in.* [a] 1	*Ft. in.* [a] 1
Coal	8 6	8 2	9 2	7 7	8 4
Floor, clay.					
Thickness of bed	8 8	8 5	9 4	7 8	8 5
Thickness of coal sampled	8 6	8 2	9 2	7 7	8 4

[a] Not included in sample.

Section A (sample 25263) was measured at face of 14 room, 7 panel, 5 east entry, 2,000 feet from pit mouth. Section B (sample 25264) was measured at face of 29 room, 5 panel, 5 east entry, 1,800 feet from pit mouth. Section C (sample 25265) was measured at face of 3 panel, 12 entry, 2,800 feet from pit mouth. Section D (sample 25266) was measured at face of 1 room, 6 panel, 10 east entry, 2,600 feet from pit mouth. Section E (sample 25267) was measured at face of 3 panel, 11 east entry, 2,600 feet from pit mouth. Section F (sample 25268) was measured at face of 11 east entry, 2,800 feet from pit mouth. Section G (sample 25269) was measured at face of 13 room, 5 panel, 10 east entry, 2,500 feet from pit mouth. Section H (sample 25270) was measured at face of 7 room, 5 panel, 10 east entry, 2,400 feet from pit mouth. Section I (sample 25271) was measured at face of 8 room, 8 panel, 9 east entry, 2,400 feet from pit mouth. Section J (sample 25272) was measured at face of 5 room, 6½ panel, 9 east entry, 2,300 feet from pit mouth. Section K (sample 25273), was measured at face of 14 room, 6 panel, 10 east entry, 2,400 feet from pit mouth.

An ultimate analysis of a composite sample made by combining samples 25263 to 25273 is given under laboratory No. 25274.

The mine is opened by a slope 200 feet long driven down a pitch of 7°. It is worked on the double-entry room-and-pillar system of mining. In 1916 the coal was undercut with puncher drills and electrical coal-cutting machines, and shot down with black blasting powder. About 25 per cent of the coal was shipped as run of mine. The screening yielded four market sizes, as follows: 6, 2½, 1¼, and ¾ inch, as well as slack. There were four loading tracks with a capacity of 40 cars. Daily output, 1,600 tons.

For descriptions and analyses of other samples of coal from this mine, see Bureau of Mines Bull. 85, pp. 141, 142, 407-409.

For geologic relations of this coal see U. S. Geol. Survey Bull. 341, 1907, pp. 123-150.

Monarch. Monarch Mine.

Analyses 19006 to 19009, 19054, 25190, 25191, 25244 to 25250, 25252, 25253, 25311, 25312, 25313, 25192 (pp. 130-131). Subbituminous coal, Sheridan field, from Monarch mine, a drift mine in SE. ¼ sec. 24, T. 57 N., R. 85 W., at Monarch, on the Chicago, Burlington & Quincy R. R. Coal bed, Monarch; Tertiary age, Fort Union formation. Average thickness, 30 feet, about 8 to 10 feet of which is mined. Dip, slightly southeast. The upper part of the bed is coal mixed with bands of shale, which are nonpersistent; mining is confined to the lower part. Floor, dark-gray underclay, which becomes soft and swells when wet. The Carney bed is 90 feet below the Monarch. The coal bed was sampled by Edward Steidle on March 23 and 24, 1914, as described below:

Sample 19006 represented a 10-foot 2-inch cut starting 1 foot from bottom at face of 8 east entry. Sample 19007 represented a 9-foot 10-inch cut starting 1 foot from bottom at face of 5 east entry. Sample 19008 represented a 9-foot 10-inch cut starting 1 foot from bottom at face of 5 west entry, 2,000 feet from opening, in the heart of the property.

An ultimate analysis of a composite sample made by mixing an equal amount of samples 19006, 19007, and 19008 is given under laboratory No. 19009.

Sample 19054 represented a 9-foot 10-inch cut of coal taken at face of 5 west entry, 2,000 feet from opening.

The bed was also sampled by H. J. Rahilly on May 6, 23, and 24, 1916.

Sample 25190 was measured on rib of 4 room, 50 feet in room, 3 west entry, 1,500 feet from opening, and represented 8 feet 9 inches of coal. Sample 25191 was measured on rib of 24 room, 50 feet in room, 2 butt entry, 6 west entry, 1,600 feet from opening, and represented 8 feet of coal. Sample 25244 was measured at face of 6 room, 3 west entry, 1,600 feet from opening, and represented 9 feet 3 inches of coal. Sample 25245 was measured at face of 10 room, 4 butt entry, 6 west entry, 2,000 feet from opening, and represented 8 feet of coal. Sample 25246 was measured at face of 18 room, 6 butt entry, 5 west entry, 2,200 feet from opening, and represented 8 feet 7 inches of coal. Sample 25247 was measured at face of 8 room, 8 butt entry, 6 west entry, 2,420 feet from opening, and represented 8 feet 5 inches of coal. Sample 25248 was measured at face of 11 room, 10 butt entry, 5 west entry, 2,500 feet from opening, and represented 8 feet 5 inches of coal. Sample 25249 was measured at face, new 8 west entry, 1,000 feet from opening, and represented 7 feet 5 inches of coal. Sample 25250 was measured at face of 16 room, 7 east entry, 2,300 feet from opening, and represented 7 feet 6 inches of coal. Sample 25252 was measured on rib, 175 feet outby 9 west entry, in main haulageway, 800 feet from opening, and represented 7 feet 2 inches of coal. Sample 25253 was measured on rib, 600 feet from opening, in main haulageway, and represented 10 feet 7 inches of coal. Sample 25311 was measured on rib, 1,200 feet in 9 west entry, 2,200 feet from opening, and represented 7 feet 1 inch of coal. Sample 25312 was measured on rib, 700 feet in 9 west entry, 1,700 feet from opening, and represented 7 feet 6 inches of coal. Sample 25313 was measured on rib, 2,000 feet in 9 west entry, 3,000 feet from opening, and represented 9 feet 1 inch of coal.

The ultimate analysis of a composite sample made by combining samples 25190, 25191, 25244 to 25250, 25252, 25253, and 25311 to 25313 is given under laboratory No. 25192.

The mine is opened by a drift and worked by a double-entry, room-and-pillar, panel system. In 1916 the coal was undercut with electric chain coal-cutting machines and broken down with black blasting powder. Machine cuttings were loaded out with the coal. No impurities mixed with the coal in loading. About one-third of the coal was shipped as run of mine; the rest was screened. About 68 per cent of the coal screened passed through the screens. No pickers were employed on the cars. The mine had a storage-bin capacity of 280 tons. The lumps and slack appeared fairly good on the cars. There were eight loading tracks, with a capacity of 100 loaded and 100 empty cars. About half of the coal mined was from advance workings. Average daily output was 1,800 tons.

For descriptions and analyses of other samples of coal from this mine see Bureau of Mines Bull. 22, 1913, pp. 309, 1121, and Bull. 85, 1914, pp. 143, 409.

For geologic relations of this coal see U. S. Geol. Survey Bull. 341, 1907, p. 138.

SWEETWATER COUNTY.

Rock Springs. Prospect.

Analysis 22552 (p. 131). Subbituminous coal, Rock Springs field, from prospect in sec. 24, T. 12 N., R. 104 W., about 40 miles south of Rock Springs, a mining town on the Union Pacific R. R. Coal bed, Tipton; Tertiary age, Wasatch formation. The bed was sampled on July 2, 1915, by A. R. Schultz. The sample, which was weathered, was taken from coal 3 feet 6 inches thick. Both roof and floor are sandy shale.

For geologic relations of this coal see U. S. Geol. Survey Bull. 381, 1910, pp. 214–281.

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The references given below are chiefly the publications of State surveys, and refer to papers of a general nature rather than to descriptions of separate localities. The list is incomplete, but it is believed to contain the more important references, other than those in reports of the Geological Survey, to the composition and geologic relations of the various coals in this country.

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