



STATE OF ALASKA

Department of Natural Resources

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## Division of Geological Survey

## MINES BULLETIN



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*Published to Accelerate the Development of the Mining Industry in Alaska*

William A. Egan - Governor

Charles F. Herbert - Commissioner

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## DIVISION FIELD WORK

Field work for geologists of the Division of Geological Survey is underway. In southeastern Alaska, Gordon Herreid, assisted by James Pray and Tom Bundtzen, is continuing with mapping on Prince of Wales Island in the Hetta Inlet area. Rocks and structure of the Wales group will be mapped and described, determining structural relationships. Geochemical bedrock and stream-sediment sampling is also being done.

Thomas E. Smith and assistant Gary Kline are continuing investigations in south-central Alaska. Examination of remote parts of Healy A-2 and Mt. Hayes A-6 quadrangles will combine with previous reconnaissance by this field party.

Making their field camp at the Arctic Camp airstrip near the Bear Creek Mining Company will be geologists C. E. Fritts, G. R. Eakins and R. E. Garland, assisted by Mark Zdepski, Bill Roberts and John Larson. Mapping of the southern and eastern parts of the Ambler River quadrangle will be done along with westernmost parts of the Survey Pass quadrangle. Mapping will tie in with previous mapping done by Fritts, Eakins and Garland near Walker Lake in 1971.

Passing through Fairbanks on their way to summer field work in the Beaver quadrangle were W. P. Brosge and H. N. Reiser of the U. S. Geological Survey. While in town they conferred with ADGS personnel about Brooks Range geology.

## AEROMAGNETIC SURVEY

The Aeromagnetic Survey work by the State of Alaska in 1972 will cover 23,316.3 square miles of central and eastern Alaska. Apparent low bidder is the geophysical survey company of Lockwood, Kessler and Bartlett, a company with previous experience in magnetic surveying in Alaska for both the U. S. Geological Survey and the State of Alaska. Contract specifications are similar to those of 1971 with the additional requirement of supplying the data on digital magnetic tape for low cost computerized data reduction. Contract price per square mile is about 12% less than the price for 1971. The 1971 work included an area in which the weather is cloudy and foggy and the 1972 work is in an area of predominantly good weather. Survey line spacing is 3/4 mile at 1000 feet above ground level where practicable, flown north and south.

The 1972 Aeromagnetic Survey areas are A, B, C, D, and E below. A is the Talkeetna Mts. quadrangle, 6654.0 square miles; B is the north tier (D-1 thru D-8) of the Anchorage quadrangle, 1698.4 square miles; C is the Eagle quadrangle, 6206.4 square miles; D is the fill-in area of the Mt. Hayes and Healy quadrangles surrounded by our 1971 magnetic survey work, 2103.5 square miles; E is the Talkeetna quadrangle, 6654.0 square miles. The work is to be completed by the end of December of this year.

The results of the survey will be published as a series of maps at one inch to the mile showing the contours of magnetic intensity printed in red on a background of the USGS topographic contours printed in grey. Inquiries regarding the geophysical survey work should be directed to Norman J. Veach, Geophysicist.

## NEW REPORTS ON ALASKAN GEOLOGY

This issue of the Bulletin is the first in which we are including entries for recently published reports, articles and maps regarding Alaska geology and related earth science listed in the Bibliography and Index of Geology, which is published by the Geological Society of America. Entries taken from that source have been modified only to the extent that the positions of author names and publication dates have been moved forward. This enables us to list the entries alphabetically by last names of authors or senior authors (and chronologically by year of publication) as we have done in our Bibliography of Alaska Geology.

Abbreviations used in the GSA Bibliography and Index of Geology follow recommendations of Standards Committee Z39 of the American National Standards Institute. They are explained in each volume of the series. These abbreviations differ slightly from those used in our Bibliography of Alaskan Geology, which resemble abbreviations currently used in U. S. Geological Survey publications. However, both types are reasonably clear to most readers familiar with professional geological literature, so we probably shall continue to use both until we prepare the 1972 volume of the Bibliography of Alaska Geology.

The Bibliography and Index of Geology (v. 36, no. 1, Jan. 1972) published by the Geological Society of America contains the following Alaskan entries:

Brosge, W. P.; Tailleur, L. L., 1971, Northern Alaska Petroleum Province, In Future petroleum provinces of the United States; their geology and potential, Vol. 1: Am. Assoc. Pet. Geol., Mem., No. 15, p. 68-99, illus. (incl. geol. sketch maps)

Crick, R. W., 1971, Potential Petroleum Reserves, Cook Inlet Alaska, In Future petroleum provinces of the United States; their geology and potential, Vol. 1: Am. Assoc. Pet. Geol., Mem., No. 15, p. 109-119, illus. (incl. sketch maps)

Forbes, R. B.; Hamilton, Thomas; Tailleur, I. L.; others, 1971, Tectonic Implications of Blueschist Facies Metamorphic Terranes in Alaska: Nature; Phys. Sci., Vol. 234, No. 49, p. 106-108, sketch map

Gryc, George, 1971, Summary of Potential Petroleum Resources of Region 1 (Alaska and Hawaii); Alaska, In Future petroleum provinces of the United States; their geology and potential, Vol. 1: Am. Assoc. Pet. Geol., Mem., No. 15, p. 55-67, illus. (incl. geol. sketch maps)

Harrington, C. R., 1970, Ice age mammal research in the Yukon Territory and Alaska, In Early Man and environments in northwest America: Univ. Calgary Archaeol. Assoc., Calgary, p. 35-51, sketch map

Hatten, C. W., 1971, Petroleum Potential of Bristol Bay Basin, Alaska, In Future petroleum provinces of the United States; their geology and potential, Vol. 1: Am. Assoc. Pet. Geol., Mem., No. 15, p. 105-108, illus. (incl. sketch map)

Haugen, R. K.; Brown, Jerry, 1971, Natural and man-induced disturbances of permafrost terrane, In Environmental Geomorphology; State Univ., New York, Binghamton, New York, p. 139-149, illus., Examples of environmental damage, practices for prevention

Hoare, J. M.; Condon, W. H., 1971, Geologic map of the St. Michael quadrangle, Alaska; U. S. Geol. Surv., Misc. Geol. Invest. Map, No. I-682, scale 1:250,000, Washington, D. C. (Accompanied by 5-page explanatory text)

Hoare, J. M.; Condon, W. H., [1971], Geologic map of the St. Michael quadrangle, Alaska, [explanatory text]: U. S. Geol. Surv., 5 p., [Washington, D. C.], (Accompanies Miscellaneous Geologic Investigations Map I-682) Andesitic bedrock, Cretaceous sedimentary rocks, Quaternary basalts, coastal plain sediments, structural geology

Hoskins, C. M.; Nelson, R. V., Jr., 1971, Size modes in biogenic carbonate sediment, southeastern Alaska: Sediment. Petrol., Vol. 41, No. 4, p. 1026-1037, illus. (incl. sketch maps). Sedimentology of inner neritic, high latitude continental shelves, comminution of barnacles and mollusks

Patton, W. W., Jr., 1971, Petroleum Possibilities of Yukon-Koyukuk Province, Alaska, In Future petroleum provinces of the United States; their geology and potential, Vol. 1: Am. Assoc. Pet. Geol., Mem., No. 15, p. 100-104, geol. sketch map

Petocz, R. G., 1971, Biostratigraphy and Lower Permian Fusulinidae of the Upper Delta River Area, East-Central Alaska Range: Geol. Soc. Am., Spec. Pap., No. 130, 94 p., illus. (incl. geol. sketch map) Taxonomy, 18 species in three genera (10 new species), six assemblage zones; correlation with Canada, Greenland, USSR, paleogeography

Pettibone, H. C.; Waddell, G. G., 1971, Stability of an underground room in frozen gravel, In Engineering geology and soils engineering symposium, 9th, Proc.: Idaho Dep. Highw., Boise, p. 3-30, illus. (incl. sketch maps)

Pewe, T. L., 1970, Altiplanation terraces of early Quaternary age near Fairbanks, Alaska: *Acta Geogr. Łódz.*, No. 24, p. 357-363, illus. (incl. sketch maps)

Plafker, George, 1971, Possible Future Petroleum Resources of Pacific-Margin Tertiary Basin, Alaska, In *Future petroleum provinces of the United States; their geology and potential*, Vol. 1: Am. Assoc. Pet. Geol., Mem., No. 15, p. 120-135, illus. (incl. geol. sketch map)

Thompson, C. J.; Coleman, H. J.; Dooley, J. E.; others, 1971, Bumines analysis shows characteristics of Prudhoe Bay crude: *Oil Gas J.*, Vol. 69, No. 43, p. 112-114, 118, 120, illus.

Von Huene, Roland; Lathram, E. H.; Reimnitz, Erk, 1971, Possible Petroleum Resources of Offshore Pacific-Margin Tertiary Basin, Alaska, In *Future petroleum provinces of the United States; their geology and potential*, Vol. 1: Am. Assoc. Pet. Geol., Mem., No. 15, p. 136-151, illus. (incl. sketch maps)

Wood, E. D.; Hood, D. W., 1971, Determination of Gold in Geological Materials by Neutron Activation Analysis, In *Activation Analysis in Geochemistry and Cosmochemistry*, p. 391-396, illus., Universitetsforlaget, Oslo-Bergen-Tromsø

We also are including in this issue entries for 42 of 202 aeromagnetic maps recently published by the State. The maps included here cover the western part of the East Alaska Range Aeromagnetic Survey project undertaken by the Alaska Geological Survey during the summer of 1971. The maps listed below are 15- by 30-minute quadrangles that cover parts of the Fairbanks, Gulkana, Healy and Mt. Hayes 1- by 3-degree quadrangles. These maps were released for sale February 9, 1972. Similar maps covering the eastern part of the project area were listed in the May issue of this Bulletin. Subsequent issues will contain lists of aeromagnetic maps that are products of similar projects undertaken by the State on the Seward Peninsula and in the Goodnews area. The Fairbanks, Gulkana, Healy and Mt. Hayes maps are as follows:

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, Fairbanks (A-1) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, Fairbanks (A-2) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, Fairbanks (A-3) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, Fairbanks (A-4) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, [Northern] Gulkana (C-1) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, Gulkana (D-1) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, Gulkana (D-2) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, [northern] Gulkana (D-3) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, Healy (A-1) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, Healy (A-2) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, Healy (A-3) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, Healy (A-4) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, [southern and central] Healy (B-1) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, Healy (B-2) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, Healy (B-3) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, Healy (B-4) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, [northern] Healy (C-1) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, [northern] Healy (C-2) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, Healy (C-3) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, [eastern] Healy (C-4) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, Healy (D-1) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, Healy (D-2) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, Healy (D-3) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, Healy (D-4) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, [southern] Mt. Hayes (A-1) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, [southern and central] Mt. Hayes (A-2) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, Mt. Hayes (A-3) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, Mt. Hayes (A-4) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, Mt. Hayes (A-5) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, Mt. Hayes (A-6) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, [northern and central] Mt. Hayes (B-1) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, [northern] Mt. Hayes (B-2) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, [southern] Mt. Hayes (B-4) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, [southern] Mt. Hayes (B-5) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, [southern] Mt. Hayes (B-6) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, Mt. Hayes (C-1) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, Mt. Hayes (C-2) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, Mt. Hayes (C-3) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, Mt. Hayes (C-4) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, [northern and central] Mt. Hayes (C-5) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, [northern] Mt. Hayes (C-6) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

Alaska Geological Survey, 1972, Aeromagnetic survey, east Alaska Range, [southern] Mt. Hayes (D-6) quadrangle, Alaska: Alaska, Dept. Nat. Resources, Div. Geol. Survey, 1 aeromag. map (scale 1:63,360)

U. S. Geological Survey open-file reports concerning Alaskan geology are listed here in a form suitable for inclusion in the next volume of the Bibliography of Alaskan Geology. The numbers assigned to these reports are informal ones used by the Alaskan Mineral Resources Branch of the USGS at Menlo Park, California. New reports are as follows:

Patton, W. W., Jr.; Csejtey, Bela, Jr., 1972, Analyses of stream-sediment and rock samples from St. Lawrence Island, Alaska, 1966-1971: U. S. Geol. Survey, Alaskan open-file rept. 521, 82 p. (incl. 73 p. tabular material), 2 pl.

Alaska Geological Survey reports may be purchased or inspected at:

Maintenance Building, Univ. Alaska, Box 80007, COLLEGE, Ak. 99701  
 323 East Fourth Avenue, ANCHORAGE, Ak. 99501  
 Room 509, Goldstein Building, Pouch M, JUNEAU, Ak. 99801  
 Room 312, 306 Main Street, Box 2438, KETCHIKAN, Ak. 99901

U. S. Geological Survey Alaskan open-file reports usually are available as follows:

Purchase: Ak. Min. Res. Branch, 345 Middlefield Road, MENLO PARK, Calif. 94025  
 Inspection: Room 108, Skyline Building, 508 Second Avenue, ANCHORAGE, Ak. 99501  
 Room 402, Brooks Building, Univ. Alaska, COLLEGE, Ak. 99701  
 Room 441, Federal Building, JUNEAU, Ak. 99801  
 Alaska Geological Survey offices listed above

NUMBER OF  
CLAIMS

NEW MINING CLAIMS

DATE  
NOTICE POSTED

CREEK OR AREA	QUADRANGLE	DATE
Jade Mountain	Ambler River	Nov. 1971
Ningybyak Creek	Ambler River	Mar. 1972
Butte Creek	Circle	Apr. 1972
Birch Creek	Circle	Apr. 1972
Paul Young Creek	Craig	Apr. 1972
Ester Dome	Fairbanks	Nov. & Feb. 1972
Sec. 16, T17N, R15E, KRM	Hughes	Mar. 1972
Skilak Lake	Kenai	Aug. 1971
Sec. 15, T8N, R2E, FM	Livengood	Mar. 1972
Dome Creek	Livengood	Apr. 1972
Tolovana River & Beaver Creek	Livengood	Apr. 1972
Big Bend Creek	McCarthy	Feb. 1972
Phelan Creek	Mt. Hayes	Apr. 1972
Mile 212 Richardson Hwy.	Mt. Hayes	Feb. 1972
Moose Creek	Mt. McKinley	Sept. 1971
Elephant Creek	Russian Mission	Feb. 1972
Secs. 8, 9, 10, T7S, R5W, SM	Seldovia	Jan. 1972
Kanuti Kilolitna River	Tanana	Feb. 1972

METAL MARKET

Metals	May 28, 1972	Month Ago	Year Ago
Antimony ore, stu equivalent	\$7.03-8.16	\$7.03-8.16	\$9.09-10.91
European ore			
Barite (drilling mud grade per ton)	\$18-22	\$18-22	\$17-20
Beryllium powder, 98%, per lb.	\$54-66	\$54-66	\$54-66
Chrome ore per long ton	\$24-27	\$25-27	\$25-27
Copper per lb.	52.57¢	52.57¢	52.8¢
Gold per oz.	\$57.66	\$49.68	\$40.93
Lead per lb.	15.6¢	15.6¢	13.5¢
Mercury per 76# flask	\$190	\$159	\$275-285
Molybdenum conc. per lb.	\$1.72	\$1.72	\$1.72
Nickel per lb.	\$1.33	\$1.33	\$1.33
Platinum per oz.	\$106.94	\$110.21	\$120-125
Silver, New York, per oz.	157.18¢	155.42¢	167.3¢
Tin per lb.	176.0¢	181.5¢	165.8¢
Titanium ore per ton (Ilmenite)	\$30-35	\$30-35	\$30-35
Tungsten per unit	\$55.00	\$55.00	\$55.00
Zinc per lb.	18.0¢	17.7¢	16.0¢