

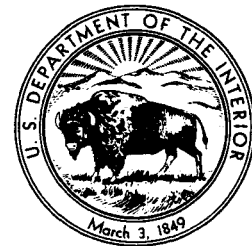
# Short Papers in the Geologic and Hydrologic Sciences, Articles 1-146

GEOLOGICAL SURVEY RESEARCH 1961

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GEOLOGICAL SURVEY PROFESSIONAL PAPER 424-B

*Scientific notes and summaries of investigations  
prepared by members of the Geologic, Water  
Resources, and Conservation Divisions in the  
fields of geology, hydrology, and allied sciences*



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Thomas B. Nolan, *Director*

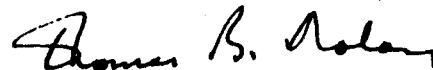
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## FOREWORD

The scientific and economic results of work by the United States Geological Survey during the fiscal year 1961, the 12 months ending June 30, 1961, will be summarized in four volumes of which this is the first. This volume includes 146 short papers on a variety of subjects in the fields of geology, hydrology, and related sciences, prepared by members of the Geologic, Water Resources, and Conservation Divisions of the Survey. These papers are of two kinds. Some are announcements of new discoveries or observations on problems of limited scope, which may or may not be described in greater detail subsequently. Others summarize conclusions drawn from more extensive or continuing investigations, which in large part will be described in greater detail in reports to be published at a later date.

Professional Papers 424-C and -D include additional short papers of the same character as those in the present volume. Professional Paper 424-A provides a synopsis of the more important new findings resulting from work during the fiscal year.



THOMAS B. NOLAN

*Director.*

# CONTENTS

	Page
<b>Foreword</b> .....	III
<b>Geology of metalliferous deposits</b>	
1. Temperature of formation of a Precambrian massive sulfide deposit, Copper King mine, Front Range, Colo., P. K. Sims and Priestley Toulmin, 3d .....	B-1
2. Coffinite in uranium vein deposits of the Front Range, Colorado, by P. K. Sims, E. J. Young, and W. N. Sharp....	3
3. Structural control of epigenetic uranium deposits in carbonate rocks of northwestern New Mexico, by Lowell S. Hilpert .....	5
4. Origin of uranium and gold in the quartzite-conglomerate of the Serra de Jacobina, Brazil, by Max G. White .....	8
<b>Hydrologic studies</b>	
5. Magnitude and frequency of floods in suburban areas, by R. W. Carter .....	9
6. Effect of artificial storage on peak flow, by William D. Mitchell .....	12
7. Distinctive characteristics of glacier runoff, by Mark F. Meier and Wendell V. Tangborn .....	14
8. Recent hydrologic trends in the Pacific Northwest, by Wilbur D. Simons.....	17
9. Precipitation as a variable in the correlation of runoff data, by William J. Schneider .....	20
10. Regional low flow frequency analysis, by H. C. Riggs .....	21
11. Modified conveyance-slope applied to development of stage-fall-discharge ratings, by William C. Griffin .....	23
12. Flow in an artificially roughened channel, by H. J. Koloseus and Jacob Davidian .....	25
13. Dimensions of some stable alluvial channels, by Stanley A. Schumm.....	26
14. Some factors influencing streambank erodibility, by I. S. McQueen .....	28
15. An example of channel aggradation induced by flood control, by Norman J. King .....	29
16. Some effects of microclimate on slope morphology and drainage basin development, by Richard F. Hadley.....	32
17. Hydrologic significance of buried valleys in glacial drift, by Stanley E. Norris and George W. White.....	34
18. Plan to salvage evapotranspiration losses in the central Sevier Valley, Utah, by Richard A. Young and Carl H. Carpenter.....	36
19. Relation between storage changes at the water table and observed water-level changes, by R. W. Stallman .....	39
20. The significance of vertical flow components in the vicinity of pumping wells in unconfined aquifers, by R. W. Stallman .....	41
21. Methods for study of evapotranspiration, by O. E. Leppanen .....	43
22. Water movement and ion distribution in soils, by R. F. Miller and K. W. Ratzlaff .....	45
23. Compression of elastic artesian aquifers, by S. W. Lohman .....	47
24. Measurement of compaction of aquifer systems in areas of land subsidence, by Ben E. Lofgren .....	49
25. The coefficient of storage in a region of major subsidence caused by compaction of an aquifer system, by J. F. Poland .....	52
26. Compaction of an aquifer system computed from consolidation tests and decline in artesian head, by Raymond E. Miller .....	54
27. Development of an ultrasonic method for measuring stream velocities, by H. O. Wires.....	58
28. Preliminary design of an electric analog of liquid flow in the unsaturated zone, by R. W. Stallman .....	60
29. Direct-reading conductivity bridge, by I. S. McQueen and C. R. Daum .....	63
<b>Geology and hydrology of eastern United States</b>	
30. Age of the "ribbon rock" of Aroostook County, Maine, by Louis Pavlides, Robert B. Neuman, and William B. N. Berry .....	65
31. Ratio of thorium to uranium in some plutonic rocks of the White Mountain plutonic-volcanic series, New Hampshire, by Arthur P. Butler, Jr. ....	67
32. Uranium and thorium in the older plutonic rocks of New Hampshire, by John B. Lyons .....	69
33. Distance between basins versus correlation coefficient for annual peak discharge of streams in New England, by Jacob Davidian and M. A. Benson .....	71
34. Pleistocene stratigraphy of Boston, Massachusetts, by C. A. Kaye.....	73
35. Iron ores of St. Lawrence County, northwest Adirondacks, N. Y., by B. F. Leonard and A. F. Buddington .....	76
36. Characteristics of seiches on Oneida Lake, N. Y., by John Shen .....	80

## Geology and hydrology of eastern United States—Continued

37. Variations of pH with depth in anthracite mine-water pools in Pennsylvania, by Wilbur T. Stuart and Thomas A. Simpson .....	B-82
38. Angular unconformity separates Catskill and Pocono formations in western part of Anthracite region, Pennsylvania, by J. Peter Trexler, Gordon H. Wood, Jr., and Harold H. Arndt.....	84
39. Reefs in the Fort Payne formation of Mississippian age, south-central Kentucky, by Robert E. Thaden, Richard Q. Lewis, J. Mark Cattermole, and Alfred R. Taylor.....	88
40. The Tuscaloosa gravel in Tennessee and its relation to the structural development of the Mississippi embayment syncline, by Melvin V. Marcher.....	90
41. Systematic pattern of Triassic dikes in the Appalachian region, by Philip B. King.....	93
42. Rainfall and minimum flows along the Tallapoosa River, Alabama, by H. C. Riggs.....	96
43. Stress model for the Birmingham red iron-ore district, Alabama, by Thomas A. Simpson.....	98
44. Water-temperature distribution in a tidal stream, by Frederick W. Wagener.....	100
45. Recent lead-alpha age determinations on zircon from the Carolina Piedmont, by William C. Overstreet, Henry Bell, III, Harry J. Rose, Jr., and Thomas W. Stern .....	103
46. Tidal fluctuations of water levels in wells in crystalline rocks in north Georgia, by J. W. Stewart.....	107

## Geology and hydrology of western conterminous United States

47. A new map of western conterminous United States showing the maximum known or inferred extent of Pleistocene lakes, by J.-H. Feth.....	110
48. Recent flood-plain formation along the Cimarron River in Kansas, by S. A. Schumm and R. W. Lichty.....	112
49. Abnormal bedding in the Savanna sandstone and Boggy shale in southeastern Oklahoma, by Thomas A. Hendricks .....	114
50. Reservoir evaporation and seepage, Honey Creek, Tex., by F. W. Kennon .....	117
51. Pre-Pennsylvanian Paleozoic stratigraphy, Mockingbird Gap quadrangle, New Mexico, by George O. Bachman.....	119
52. Preliminary results of test drilling in depressions on the High Plains, Lea County, N. Mex., by John S. Havens.....	123
53. Lower member of Mural limestone of Early Cretaceous age, Bisbee quadrangle, Arizona, by Philip T. Hayes and Edwin R. Landis .....	125
54. Origin of cross-strata in fluvial sandstone layers in the Chinle formation (Upper Triassic) on the Colorado Plateau, by John H. Stewart.....	127
55. Fossil woods associated with uranium on the Colorado Plateau, by Richard A. Scott.....	130
56. Late Cenozoic events of the Leadville district and upper Arkansas Valley, Colorado, by Ogden Tweto.....	133
57. Movement of the Slumgullion earthflow near Lake City, Colo., by Dwight R. Crandell and D. J. Varnes.....	136
58. Relations of metals in lithosols to alteration and shearing at Red Mountain, Clear Creek County, Colo., by P. K. Theobald, Jr., and C. E. Thompson .....	139
59. Hydrology of small grazed and ungrazed drainage basins, Badger Wash area, western Colorado, by Gregg C. Lusby.....	141
60. Abandonment of Unaweep Canyon, Mesa County, Colo., by capture of the Colorado and Gunnison Rivers, by S. W. Lohman .....	144
61. Tripartition of the Wasatch formation near De Beque in northwestern Colorado, by John R. Donnell .....	147
62. Diamictite facies of the Wasatch formation in the Fossil basin, southwestern Wyoming, by J. I. Tracey, Jr., S. S. Oriel, and W. W. Rubey.....	149
63. Tongues of the Wasatch and Green River formations, Fort Hill area, Wyo., by S. S. Oriel.....	151
64. Age of the Evanston formation, western Wyoming, by W. W. Rubey, S. S. Oriel, and J. I. Tracey, Jr.....	153
65. Permafrost and thaw depressions in a peat deposit in the Beartooth Mountains, northwestern Wyoming, by William G. Pierce.....	154
66. Evidence for Early Cretaceous folding in the Black Hills, Wyo., by Glen A. Izett, Charles L. Pillmore, and William J. Mapel .....	156
67. Structure of the Clark Fork area, Idaho-Montana, by J. E. Harrison, D. A. Jobin, and Elizabeth King.....	159
68. Pleistocene geology of the central part of the Lemhi Range, Idaho, by Edward T. Ruppel and Mortimer H. Hait, Jr.....	163
69. The Michaud delta and Bonneville River near Pocatello, Idaho, by Donald E. Trimble and Wilfred J. Carr.....	164
70. Volcanic ash beds as stratigraphic markers in basin deposits near Hagerman and Glens Ferry, Idaho, by Howard A. Powers and Harold E. Malde.....	167
71. Patterned ground of possible solifluction origin at low altitude in the western Snake River Plain, Idaho, by Harold E. Malde.....	170
72. Collapse structures of southern Spanish Valley, southeastern Utah, by G. W. Weir, W. P. Puffett, and C. L. Dodson .....	173
73. Age relations of the Climax composite stock, Nevada Test Site, Nye County, Nevada, by F. N. Houser and F. G. Poole.....	176
74. Rhyolites in the Egan range south of Ely, Nev., by Daniel R. Shawe.....	178
75. Tectonic significance of radial profiles of alluvial fans in western Fresno County, Calif., by William B. Bull.....	182

**Geology and hydrology of western conterminous United States—Continued**

76. Soil-moisture storage characteristics and infiltration rates as indicated by annual grasslands near Palo Alto, Calif., by F. A. Branson, R. F. Miller, and I. S. McQueen .....	B-184
77. Causes and mechanics of near-surface subsidence in western Fresno County, Calif., by William B. Bull.....	187
78. Specific gravity of sandstones in the Franciscan and related Upper Mesozoic formations of California, by William P. Irwin.....	189
79. Some extremes of climate in Death Valley, Calif., by T. W. Robinson and Charles B. Hunt.....	192
80. Stratigraphy of desert varnish, by Charles B. Hunt.....	194
81. Use of archeology in Recent stratigraphy, by Charles B. Hunt and Alice P. Hunt.....	195
82. Evidence of strike-slip movement on northwest-trending faults in Mojave Desert, California, by T. W. Dibblee, Jr.....	197
83. Zoning of saline minerals at Deep Spring Lake, Calif., by Blair F. Jones.....	199
84. Effects of rainfall and geology on the chemical composition of water in coastal streams of California, by J. H. Feth.....	202
85. Ground water from coastal dune and beach sands, by E. R. Hampton.....	204
86. Mass budget of South Cascade Glacier, 1957-60, by Mark F. Meier.....	206
87. Competence of a glacial stream, by Robert K. Fahnestock.....	211
88. Structural barrier reservoirs of ground water in the Columbia River basalt, by R. C. Newcomb.....	213

**Geology and hydrology of Alaska and Hawaii**

89. Xenolithic nodules in the 1800-1801 Kaupulehu flow of Hualalai Volcano, by Donald H. Richter and Kiguma J. Murata.....	215
90. Reconnaissance of the Kandik and Nation Rivers, east-central Alaska, by Earl E. Brabb.....	218

**Geology of Puerto Rico**

91. Hydrothermally altered rocks in eastern Puerto Rico, by Fred A. Hildebrand.....	219
92. Andalusite-topaz greisen near Caguas, east-central Puerto Rico, by Fred A. Hildebrand.....	222
93. Ash-flow deposits, Ciales quadrangle, Puerto Rico, and their significance, by Henry L. Berryhill, Jr.....	224

**Paleontology and plant ecology**

94. Replaced Paleocene Foraminifera in the Jackson Purchase area, Kentucky, by I. G. Sohn, S. M. Herrick, and T. W. Lambert.....	227
95. Coal-ball occurrences in eastern Kentucky, by James M. Schopf.....	228
96. Age of the Ohio Creek conglomerate, Gunnison County, Colo., by D. L. Gaskill.....	230
97. Bioherms in the upper part of the Pogonip in southern Nevada, by Reuben J. Ross, Jr., and Henry R. Cornwall.....	231
98. Soil moisture under juniper and pinyon compared with moisture under grassland in Arizona, by R. F. Miller, F. A. Branson, I. S. McQueen, and R. C. Culler.....	233
99. Corals from Permian rocks of the northern Rocky Mountain region, by Helen Duncan.....	235
100. Occurrences of the Permian gastropod <i>Omphalotrochus</i> in northwestern United States, by Ellis L. Yochelson.....	237
101. Pennsylvanian rocks in southeastern Alaska, by J. Thomas Dutro, Jr., and Raymond C. Douglass.....	239

**Geophysics**

102. Poisson's ratio of rock salt and potash ore, by R. E. Warrick and W. H. Jackson.....	241
103. Frequency content of seismograms of nuclear explosions and aftershocks, by S. W. Stewart and W. H. Diment.....	243
104. Gravity, volcanism, and crustal deformation in and near Yellowstone National Park, by L. C. Pakiser and Harry L. Baldwin, Jr.....	246
105. Gravity, volcanism, and crustal deformation in the Snake River Plain, Idaho, by D. P. Hill, Harry L. Baldwin, Jr., and L. C. Pakiser.....	248
106. Gravity, volcanism, and crustal deformation in Long Valley, Calif., by L. C. Pakiser.....	250
107. Gravity study of the structural geology of Sierra Valley, Calif., by W. H. Jackson, F. R. Shawe, and L. C. Pakiser.....	254

**Mineralogy, geochemistry, and petrology**

108. Distribution of niobium in three contrasting comagmatic series of igneous rocks, by David Gottfried, Lillie Jenkins, and Frank S. Grimaldi.....	256
109. Beryllium content of cordierite, by Wallace R. Griffiths and Elmo F. Cooley.....	259
110. Germanium content of enargite and other copper sulfide minerals, by Michael Fleischer.....	259
111. Chlorine and fluorine in silicic volcanic glass, by Howard A. Powers.....	261
112. Electronprobe analysis of schreibersite (rhabdite) in the Canyon Diablo meteorite, by I. Adler and E. J. Dwornik.....	263

**Mineralogy, geochemistry, and petrology—Continued**

113. The synthesis of large crystals of andersonite, by Robert Meyrowitz and Daphne R. Ross .....	B-266
114. Unit-cell dimension versus composition in the systems: PbS-CdS, PbS-PbSe, ZnS-ZnSe, and CuFeS <sub>1.00</sub> -CuFeS <sub>1.00</sub> , by Philip M. Bethke and Paul B. Barton, Jr. ....	266
115. Unit-cell edges of cobalt- and cobalt-iron-bearing sphalerites, by Wayne E. Hall .....	271
116. X-ray diffractometer method for measuring preferred orientation in clays, by Robert H. Meade .....	273
117. Molybdenum content of glacial drift related to molybdenite-bearing bedrock, Aroostook County, Maine, by F. C. Canney, F. N. Ward, and M. J. Bright, Jr. ....	276
118. Anomalous heavy minerals in the High Rock quadrangle North Carolina, by Amos M. White and Arvid A. Stromquist .....	278
119. Iron content of soils and trees, Beaver Creek strip mining area, Kentucky, by Eugene T. Oborn .....	279
120. Mineralogy of the Olive Hill clay bed, Kentucky, by John W. Hosterman and Sam H. Patterson .....	280
121. Four environments of thorium-, niobium-, and rare-earth-bearing minerals in the Powderhorn district of southwestern Colorado, by D. C. Hedlund and J. C. Olson .....	283
122. Rhenium in plant samples from the Colorado Plateau, by A. T. Myers and J. C. Hamilton .....	286
123. Classification of elements in Colorado Plateau uranium deposits and multiple stages of mineralization, by A. T. Miesch .....	289
124. Hydrogeochemical anomalies, Fourmile Canyon, Eureka County, Nev., by R. L. Erickson and A. P. Marranzino .....	291
125. Grantsite, a new hydrated sodium calcium vanadyl vandate from New Mexico and Colorado—a preliminary description, by A. D. Weeks, M. L. Lindberg, and Robert Meyrowitz .....	293
126. Insoluble residues and Ca:Mg ratios in the Madison group, Livingston, Mont., by Albert E. Roberts .....	294
127. Manganese oxide minerals at Philipsburg, Mont., by William C. Prinz .....	296
128. Uranium and radium in ground water from igneous terranes of the Pacific Northwest, by Franklin B. Barker and Robert C. Scott .....	298
129. Sborgite in the Furnace Creek area, California, by James F. McAllister .....	299

**Geology and hydrology applied to engineering and public health**

130. Economic significance of a buried bedrock bench beneath the Missouri River flood plain near Council Bluffs, Iowa, by Robert D. Miller .....	301
131. Relation of supports to geology in the Harold D. Roberts Tunnel, Colorado, by E. E. Wahlstrom, L. A. Warner, and C. S. Robinson .....	303
132. Landslides along the Uinta fault east of Flaming Gorge, Utah, by Wallace R. Hansen .....	306

**Exploration and mapping techniques**

133. Geochemical prospecting for copper deposits hidden beneath alluvium in the Pima district, Arizona, by Lyman C. Huff and A. P. Marranzino .....	308
134. Measurement of bulk density of drill core by gamma-ray absorption, by Carl M. Bunker and Wendell A. Bradley .....	310
135. Mechanical control for the time-lapse motion-picture photography of geologic processes, by Robert D. Miller, Ernest E. Parshall, and Dwight R. Crandell .....	313
136. Liquid-level tiltmeter measures uplift produced by hydraulic fracturing, by Francis S. Riley .....	317
137. A method of recording and representing geologic features from large-diameter drill holes, by Elmer H. Baltz and James E. Weir, Jr. ....	319

**Analytical and petrographic methods**

138. Methods for decomposing samples of silicate rock fragments, by John C. Antweiler .....	322
139. Fatigue in scintillation counting, by Francis J. Flanagan .....	324
140. A simplified method of concentrating and preparing carbonate shells for C <sup>14</sup> age determinations, by Thomas C. Nichols, Jr. ....	326
141. Colorimetric determination of iron in small samples of sphalerite, by Leonard Shapiro and Martha S. Toulmin .....	328
142. Indirect semiautomatic determination of alumina with EDTA, by J. I. Dinnin and C. A. Kinser .....	329
143. Determination of copper in plant ash with neo-cuproine, by Claude Huffman, Jr., and Dwight L. Skinner .....	331
144. Direct-reading spectrometric technique for determining major constituents in natural water, by Joseph Haffty and A. W. Helz .....	333
145. Rapid quantitative estimates of quartz and total iron in silicate rocks by X-ray diffraction, by D. B. Tatlock .....	334
146. The Koberg-Daum wind-direction and wind-velocity recorder, by G. E. Koberg and C. R. Daum .....	337

**Index**

Subject .....	339
Author .....	343
Finding list of article page numbers .....	344

## 90. RECONNAISSANCE OF THE KANDIK AND NATION RIVERS, EAST-CENTRAL ALASKA

By EARL E. BRABB, Menlo Park, Calif.

The purpose of this report is to describe briefly the rocks and structure along two previously unmapped rivers in east central Alaska. All localities mentioned are shown on Charley River A-2, B-1, B-2, B-3, C-1, C-2 and D-1 quadrangles, scale 1:63,360.

All of the rocks cropping out along the Kandik River are provisionally assigned to the Kandik formation of Early Cretaceous age. They are predominantly shale, mudstone, argillite, slate, and graywacke but include minor amounts of chert-pebble conglomerate, "clean" sandstone, pebbly mudstone, and cherty limestone. These rocks seem to represent one lithogenetic sequence. Graded beds and other features suggestive of turbidity current deposits are common. The rocks are intensely deformed between the mouth of the Kandik River and Easy Moose Creek and between Indian Grave Creek and the United States-Canada border. The beds have a general northeast strike and a moderate northwest dip between Easy Moose Creek and Indian Grave Creek, and an anomalous northwest strike and moderate northeast dip in the vicinity of the border. Pelecypods collected from the formation along the Kandik River about 2 miles upstream from the mouth of Big Sitdown Creek suggest an Early Cretaceous (Valanginian) age according to D. L. Jones (written communication, 1961).

Slate, shale, mudstone, argillite, and minor graywacke and quartzite cropping out along the Nation River between the mouths of Tindir and Jungle Creeks are also provisionally referred to as the Kandik formation. These rocks are moderately to intensely deformed and appear to have an anomalous northwest strike. Several minor southeastward-

plunging folds in these rocks can be seen near the mouth of Ettrain Creek. Most of the rocks are not well dated but all of the fossils collected from them indicate an Early Cretaceous age. For example, Foraminifera collected from shale along the Nation River near the mouth of Tindir Creek are possibly of early Neocomian age, according to H. R. Bergquist (written communication, 1961). Megafossils collected from the same beds and from another locality nearby were identified by D. L. Jones (written communication) as *Polyptychites* and *Buchia* cf. *B. crassicollis* and are also suggestive of an early Neocomian (Valanginian) age.

The Kandik formation may be in fault contact with petroliferous shale and limestone of Triassic age, Tahkandit limestone of Permian age, and Nation River formation of Carboniferous (Pennsylvanian?) age, which crop out along the Nation River about 1 mile upstream from the mouth of Waterfall Creek. These late Paleozoic and early Mesozoic rocks have a northeast strike and, for the most part, a northwest dip. Conglomerate, sandstone, siltstone, and minor coal and "red beds" cropping out along the Nation River between Waterfall and Hard Luck Creeks are also provisionally referred to the Nation River formation. These rocks have a northeast strike and southeast dip. They are apparently in fault contact with shale and limestone about 2 miles downstream from the mouth of Hard Luck Creek. Corals from the limestone are of Silurian or Devonian age, according to W. A. Oliver, Jr. (written communication, 1961).

No oil seeps or deposits of economic interest were found.





101. PENNSYLVANIAN ROCKS IN SOUTHEASTERN ALASKA

By J. THOMAS DUTRO, JR., and RAYMOND C. DOUGLASS, Washington, D. C.

The apparent scarcity of marine rocks of Pennsylvanian age in Alaska has been a stratigraphic anomaly that has puzzled geologists for nearly 50 years. In his summary of the geology of Alaska, P. S. Smith (1939, p. 26) emphasized the importance of a limestone at a single locality in Soda Bay, Prince of Wales Island, concluding:

More detailed examination of the locality will be required before this determination (Pennsylvanian?) can be regarded as definite, but should it be confirmed by that study it would be of special importance, because it would prove the presence of Pennsylvanian rocks, which are unknown not only elsewhere in southeastern Alaska but in any other part of the Territory.

PRINCE OF WALES ISLAND

Material collected from this locality is not sufficiently diagnostic to establish the precise age of the beds in question. A restudy of the coelenterates by Helen Duncan, the gastropods by Ellis Yochelson, and the foraminifers by Douglass has been inconclusive. The fossils could represent a lower Namurian fauna (highest Mississippian equivalent) which might reasonably occur above the Upper Mississip-

pian *Gigantoproductus* beds, present also at Soda Bay. On the other hand, the strata of doubtful age could correlate with the Lower Pennsylvanian beds with *Gastrioceras*, which crop out in Trocadero Bay, just to the north on the west coast of Prince of Wales Island (Gordon, 1955).

Fusuline foraminifers were listed in several collections from southeastern Alaska by G. H. Girty in Buddington and Chapin (1929, p. 112-115). Girty stated that the evidence, although not unequivocal, suggested a Mississippian age. L. G. Henbest (written communication, 1936) called Girty's attention to the significance of the *Fusulinellas* in a collection from northern Kuiu Island; this information, together with the evidence from crinoids and a reevaluation by Girty of the rest of the fossils, was the basis for Kirk's (1937a, p. 110) Pennsylvanian age assignment. Our detailed reexamination of this collection has resulted in a definite Middle Pennsylvanian age determination.

Field geologists should be alert to the possibility that Pennsylvanian rocks are more widespread in the area than hitherto assumed. Further study is needed to determine the areal extent of these rocks

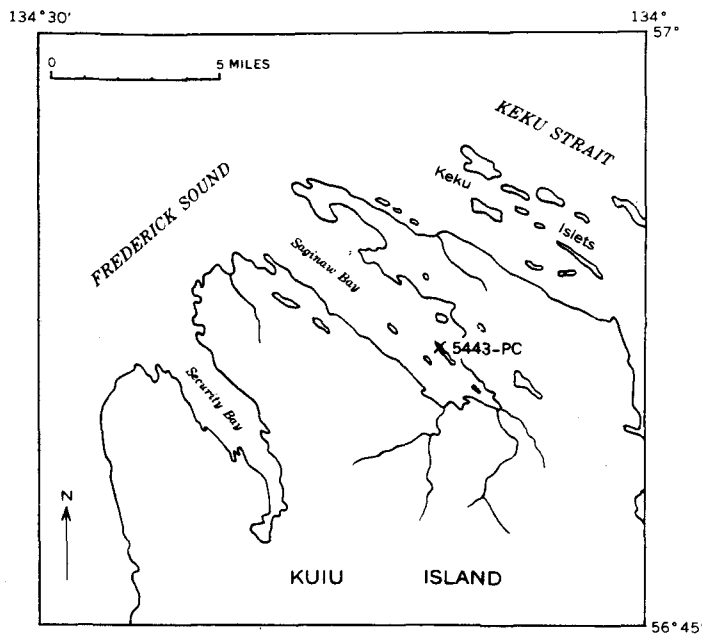


FIGURE 101.1—Locality of Middle Pennsylvanian collection (USGS 5443-PC) near the head of Saginaw Bay, northern Kuiu Island, southeastern Alaska.

and their precise stratigraphic relations with the Mississippian and Permian strata.

#### KUIU ISLAND LOCALITY

Collection 5443-PC came from a 40-foot thick bed of limestone, intercalated in a series of interlayered chert, quartzite, and chert-bearing limestone, at the northwest end of the long island near the head of Saginaw Bay, Kuiu Island (figure 101.1). Lithologically similar rock sequences are relatively widespread in southeastern Alaska at the top of what was considered Mississippian by Buddington and Chapin (1929, p. 110), and Pennsylvanian fossils should be sought in this part of the section during future field investigations.

Foraminifera identified in this collection (5443-PC = f2277 = Buddington field No. 930) are:

- Climacammina* sp.
- endothyrid foraminifer, undet.
- Tetrataxis* sp.
- Bradyina* sp.
- Nummulostegina* ? sp.
- Fusulinella* spp.

Probably two species of *Fusulinella* are represented. One is a loosely coiled form with plane septa and small, nearly symmetrical chomata. This form resembles *F. bocki* Möller, 1878. It is smaller and shows less fluting of the septa than is shown by

forms referred to this species by Forbes (1960) from Spitzbergen. The species is quite like—and may be referable to—*Fusulinella jamesensis* Thompson, Pitrat, and Sanderson (1953), described from British Columbia.

The other species is more tightly coiled, fusiform to elongate, and has asymmetrical chomata extending along the septa and floors toward the poles, somewhat resembling *Wedekindellina*. *Fusulinella iowensis* Thompson (1936) is similar in many ways to the Alaskan specimens.

The foraminiferal fauna indicates an early Middle Pennsylvanian age, possibly an Atoka equivalent.

Although Girty prepared a long fossil list from this locality, many of the forms either were not determined as to species or were listed as new. A re-study of the collection has resulted in the identification of the following larger fossils:

- Clithrocrinus pyriformis* Kirk
- Synbathocrinus* sp.
- Delocrinus* sp.
- Cyathaxonia* sp.
- aulophylloid corals, genus undet.
- horn coral, undet.
- Fenestella* sp.
- "*Batostomella*" sp.
- Cystodictya* sp.
- rhomboporoid bryozoan, indet.
- multifoliate fistuliporoid, undet.
- Leioclema* ? sp.
- Petrocrania*? sp.
- Rhipidomella* aff. *R. nevadensis* (Meek)
- Schizophoria* aff. *S. resupinoides* (Cox)
- Derbyia*? sp.
- Chonetes* sp.
- Chonetina*? sp. (compare *C. flemingi crassiradiata* Dunbar and Condra)
- Juresania* aff. *J. ovalis* Dunbar and Condra
- Krotovia*? sp.
- Linoproductus (sensu stricto)* spp.
- dictyoclostid brachiopod, genus indet.
- "*Marginifera*" sp.
- Spirifer* aff. *S. rockymontanus* Marcou
- Neospirifer* sp.
- Spiriferella* aff. *S. texana* (Shumard)
- Martinia*? sp.
- Composita* sp. (small)
- Crurithyris* sp.
- Phricodothyris*? sp.
- Stenosisma* sp.
- Hustedia* sp.
- Rhynchopora* cf. *R. magnicosta* Mather

*Crenispirifer?* sp.  
*Punctospirifer?* sp.  
*Dielasma* spp.  
*Aviculopecten* sp.  
*Schizodus* sp.  
*Platyceras* sp.  
 cf. *Straparollus (Euomphalus?) savagei* Knight  
 euomphalacean gastropod, indet.  
 pleurotomariacean gastropod, indet.  
 bellerophontacean gastropod, indet.  
 ostracodes, indet.

This revised list of megafossils clearly indicates a Pennsylvanian age. Several species to which the Alaskan fossils have been compared are restricted to the lower part of the Pennsylvanian, insofar as their distribution is known at present. For example, *Rhipidomella nevadensis* (Meek), *Chonetina flemingi crassiradiata* Dunbar and Condra, *Spirifer rocky-montanus* Marcou, *Rhynchopora magnicosta* Mather, and *Straparollus savagei* Knight are all compatible with the early Middle Pennsylvanian age assignment suggested by the fusulines. The other fossils do not conflict with such an assignment.

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