DEPARTMENT OF THE INTERIOR

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Annotated bibliography of selected references on the geology of the Baird Mountains quadrangle, northwestern Alaska

by

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Introduction

The Baird Mountains 1:250,000 quadrangle, in the southwestern Brooks Range, roughly bounded by the Kobuk and Noatak Rivers, encompasses approximately 14,015 km^2. The quadrangle includes portions of the Noatak National Wildlife Preserve, the Kobuk Valley National Park, and a large tract of land in the Squirrel River drainage basin currently administered by the U.S. Bureau of Land Management (Figure 1).

The Baird Mountains have attracted geologic interest since the recognition of its mineral resource potential at the turn of the century. The area was initially mined for coal and placer gold deposits, and has more recently been prospected for base and precious metal deposits. In adjacent quadrangles, proven mineral reserves occur in rock units continuous with, or similar to, those in the Baird Mountains quadrangle. The geology of the Baird Mountains also has important regional implications because lithologic and structural trends extending for the length of the Brooks Range change abruptly in the Baird Mountains. The regional strike changes from an easterly trend to a north-northeasterly trend for the western half of the quadrangle. West of the deflection in strike, the rocks change from pelitic schists to an extensive accumulation of lower to middle Paleozoic carbonates. To the north of these schists and carbonates are middle and upper Paleozoic carbonates and clastic rocks that are more consistent with regional trends.

The bibliography consists of 339 annotated references and a subject index (table 1). The subject index includes topical, area specific and regional categories. References designated as regional are limited to the Brooks Range. Annotations are brief, pertain only to the portion of the article relevant to the geology of the Baird Mountains quadrangle, and are not intended to evaluate the reference. Publications such as maps with sufficiently self-explanitory titles do not have annotations. Unobtainable references also lack annotations.

The bibliography represents a comprehensive, but not exhaustive literature survey. Some lesser-known publications may have been omitted. Sources of information include GEOREF, U.S. Geological Survey bibliographies, and State of Alaska bibliographies. References include state and federal publications, articles and abstracts from scientific journals, and some unpublished theses and dissertations. Trade journals were not consulted. Articles published after April 1, 1985 do not appear in this bibliography.

Acknowledgements

The preparation of this bibliography was greatly facilitated by comprehensive bibliographies prepared by Edward H. Cobb of the U.S. Geological Survey. Special thanks go to Ellen White and Mike Mullen of the Technical Data Unit of the Alaskan Branch, and to the Public Inquires Office in Anchorage.

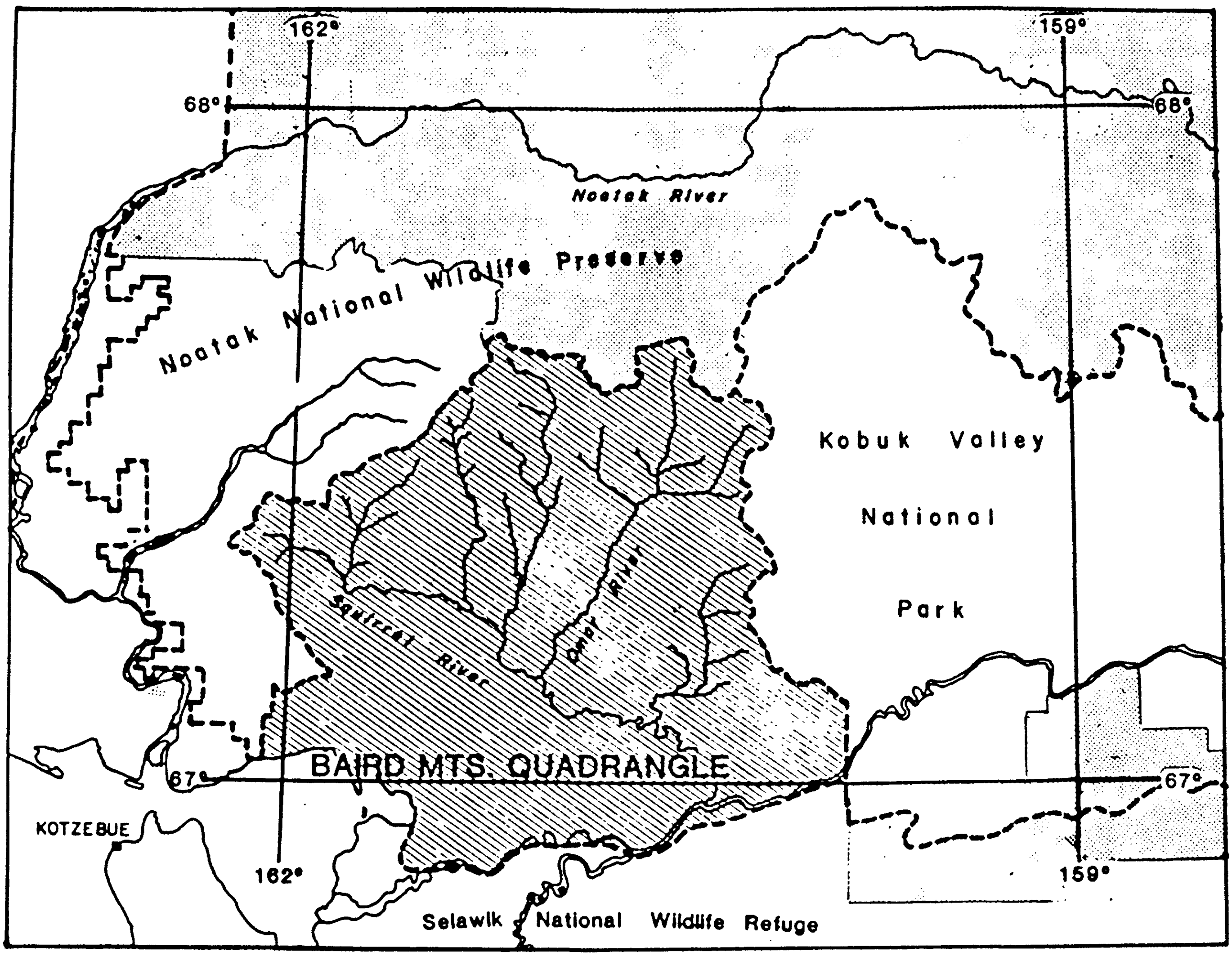

FIGURE 1.--Land use status in the Baird Mountains quadrangle. Hatured area designates lands managed by the Bureau of Land Management. Stipled areas designate wilderness areas, which, along with the white areas of the Noatak National Wildlife Preserve and the Kobuk Valley National park, are managed by National Park Service.

Table 1.

Explanation of Subject Coding

Subject Key

A - Areal Geology
E - Economic Geology
G - Geophysics
H - Historical
I - Igneous Rocks
M - Metamorphic Rocks
Q - Quaternary
S - Stratigraphy
T - Structure and Tectonics
W - Water Resources

r - reference provides a regional perspective
b - reference pertains specifically to the Baird Mountains quadrangle
a - reference contains isotopic or fossil age
u - reference names or redefines a rock unit

Examples

(T,r)	Reference concerns regional tectonics (i.e. tectonics of the western Brooks Range)
(S,u)	Reference names stratigraphic unit
(S,T,b)	Reference discusses stratigraphy and structure of an area within the Baird Mountains quadrangle

Annotated References

(A) Adams, D. D., 1984, Geology of the northern contact area of the Arrigetch Peaks pluton, Brooks Range, Alaska [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 265. **** Describes hornfels and skarn adjacent to Arrigetch pluton.

(S,r) Adams, K. E., 1985, Facies comparison of autocthanous and allocthanous Permian and Triassic units, north-central Brooks Range, Alaska, American Associan of Petroleum Geologists, Programs and Abstracts, p. 35. **** Palinspastic reconstructions suggest shallowing trend from southwest to northeast for marine Siksikpuk and Otuk formations. Silica content and the occurrence of barite increase to the southwest. For Permian rocks, coarser grained clastic material increases toward the northeast. For Triassic rocks, sooty and phosphatic material increases to the northeast.

(E) Alaska Department of Mines, 1946, Report of the Commissioner of Mines for biennium ended December 31, 1946: Alaska Department of Mines, Juneau, Alaska, 50 p. **** Includes brief summary of mining activity in Baird Mountains.

(E) Alaska Department of Mines, 1950, Report of the Commissioner of Mines for biennium ended December 31, 1950: Alaska Department of Mines, Juneau, Alaska, 57 p. **** Includes brief summary of mining activity in Baird Mountains.

(E) Alaska Department of Mines, 1952, Report of the Commissioner of Mines for biennium ended December 31, 1952: Alaska Department of Mines, Juneau, Alaska, 66 p. **** Includes brief summary of mining activity in Baird Mountains.

(E) Alaska Department of Mines, 1955, Report of the Commissioner of Mines for biennium ended December 31, 1954: Alaska Department of Mines, Juneau, Alaska, 110 p. **** Includes brief summary of mining activity in Baird Mountains.

(Z) Alaska Division of Geological and Geophysical Surveys, 1974, Annual Report 1973: Alaska Division of Geological and Geophysical Surveys, Anchorage, Alaska, 59 p.

(G,b) Alaska Division of Geological and Geophysical Surveys, 1975, Aeromagnetic map, eastern two thirds of Baird Mountains quadrangle, Alaska: Alaska Division of Geological and Geophysical Surveys Open-File Map AOF-77, 1 sheet, scale 1:250,000. **** Incomplete aeromagnetic coverage of Baird Mountains quadrangle. Contoured data from one-mile spaced flight lines with tie lines at 15-mile intervals.

(E) Alaska Division of Mines and Minerals, 1961, Report for the year 1961: Alaska Division of Mines and Minerals, Juneau, Alaska, 108 p. **** Brief summary of mining activity in the state of Alaska.

(E) Alaska Division of Mines and Minerals, 1962, Report for the year 1962: Alaska Division of Mines and Minerals, Juneau, Alaska, 119 p. **** Brief summary of mining activity in the state of Alaska.

(E) Anderson, Eskil, 1947, Mineral occurrences other than gold deposits in northwestern Alaska: Alaska Department of Mines Pamphlet 5-R, p. 23, 32, 41.

(G) Andreasen, G. E., 1960, Total intensity aeromagnetic profiles of Kobuk River, Alaska: U.S. Geological Survey Open-File Report 190, 5 sheets. **** Four flight lines along Kobuk River and seven short perpendicular tie-lines.

(S,a) Armstrong, A. K., 1970, Carbonate facies and the lithostrotionid corals of the Mississippian Kogruk Formation, De Long Mountains, northwestern Alaska: U.S. Geological Survey Professional Paper 664, 38 p. **** Detailed description of four measured sections of Kogruk Formation in the western Brooks Range, including systematic paleontology for megafossils. Environmental interpretation is more outcrop specific than regional.

(S) Armstrong, A. K., 1974, Carboniferous carbonate depositional models, preliminary lithofacies and paleo-tectonic maps, Arctic Alaska: American Association of Petroleum Geologists Bulletin, v. 58, no. 4, p. 621-625. **** Detailed interpretation of depositional environment for Lisburne Group carbonates. Thirty-six measured sections, four paleogeographic maps, and cross-sections for facies analysis are presented for Carboniferous rocks in the northern Brooks Range.

(S) Armstrong, A. K., and Bird, K. J., 1976, Facies and environments of deposition of Carboniferous rocks, arctic Alaska, in Miller, T. P., ed., Recent and ancient sedimentary environments in Alaska, Proceedings of the Alaska Geological Society Symposium, p. A1-A15. **** Facies interpretation of Carboniferous rocks in the Brooks Range suggests shallow water carbonate deposition south of deep-water deposition.

(S,a) Armstrong, A. K., and Mamet, B. L., 1977, Carboniferous microfacies, microfossils, and corals, Lisburne Group, Arctic Alaska: U.S. Geological Survey Professional Paper 849, 144 p. **** Sixteen measured sections of Lisburne Group in the Brooks Range; three from Canada. Ages, new microfossil species, environmental interpretation. Microfossils superior to corals for global correlation.

(S) Armstrong, A. K., Mamet, B. L., Brosgé, W. P., and Reiser, H. N., 1976, Carboniferous section and unconformity at Mount Doonerak, Brooks Range, northern Alaska: American Association of Petroleum Geologists Bulletin, v. 60, no. 6, p. 962-972. **** Four-hundred m measured section at Doonerak includes Kayak Shale, Alapah Limestone and Wahoo Limestone. Regional comparison is made with Lisburne Group rocks in Endicott and Romanzof Mountains.

(Q) Ashley, G. M., Hamilton, T. D., and Reed, K. M., 1984, Epiguruk Bluff--Chronology and regional correlations [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 267. **** Fluvial and eolian deposits of Wisconsin age in the Kobuk Valley.

(T) Avé Lallemant, H. G., 1984, Structural evolution of the central Brooks Range, Alaska, progress report September 1, 1983 - April 10, 1984: U.S. Department of Energy, Office of Energy Research, contract no. DE-AS05-83ER13124, 111 p. **** Descriptions of relationships between structures and rock units. Conclude 2 deformational events: (1) Jurassic to Cretaceous northward thrusting, (2) younger east-west compression.

(T,r) Avé Lallemant, H. G., Phelps, J. C., and Kelley, J. S., 1984, The kinematics of part of the frontal Brooks Range fold-thrust belt near Anaktuvuk Pass, Alaska [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 267. **** Evidence for northward and northwestward shortening on thrust faults in the Anatuvuk Pass area, overprinted by later east-west shortening.

(G) Barnes, D. F., 1967, Four preliminary gravity maps of parts of Alaska: U.S. Geological Survey Open-File Report 278, 5 p.

(G,m) Barnes, D. F., 1977a, Bouger gravity map of northern Alaska: U.S. Geological Survey Open-File Report 77-166A, 1 sheet, scale 1:1,000,000. **** Coarsely contoured gravity data based on uneven distribution of data points, for Brooks Range and North Slope.

(G) Barnes, D. F., 1977b, Preliminary Bouger gravity map of central Alaska: U.S. Geological Survey Open-File Map 77-168C, 1 sheet, scale 1:1,000,000.

(E) Barnes, F. F., 1967, Coal Resources of Alaska: U.S. Geological Survey Bulletin 1242-B, p. B1-B36. **** Coal on the Kobuk River.

(A,r) Beikman, H. M., and Lathram, E. H., 1976, Preliminary geologic map of northern Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-789, 2 sheets, scale 1:1,000,000. **** Geology of Baird Mountains quadrangle compiled from I. L. Tailleur, unpublished data, scale 1:1,000,000 and Miscellaneous Investigations Map I-530, scale 1:250,000, 1968. Highly generalized.

(E,b) Bendix Field Engineering Corporation, and Los Alamos National Laboratory, 1981, Uranium, hydrogeochemical and stream sediment reconnaissance of the Baird Mountains NTMS quadrangle, Alaska: U.S. Department of Energy National Uranium Resource Evaluation GJBX-262(81), 95 p., 7 sheets. **** Presentation of geochemical data and statistical analysis; no interpretation.

(S,r,a) Bird, K. J., Connor, C. L., Tailleur, I. L., Silberman, M. L., and Christie, J. L., 1978, Granite on the Barrow Arch, northeast NPRA, in Johnson, K. M., ed., The United States Geological Survey in Alaska--Accomplishments during 1977: U.S. Geological Survey Circular 722-B, p. B24-B25. **** Devonian granite unconformably below Lisburne Group at east Teshekpuk well; includes chemistry and K/Ar ages.

(S,a) Blome, C. D., and Reed, K. M., 1984, Mesozoic radiolarian biostratigraphy of the Brooks Range, Alaska [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 271. **** Middle to Early Jurrasic radiolarian fauna from the Otuk Formation.

(S,a) Bodnar, D. A., 1984, Stratigraphy and age of Triassic strata in north central Brooks Range, Alaska [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 271. **** Late Permian conodonts from top of Siksikpuk Formation. Interprets depositional environment for middle to late Triassic Otuk Formation.

(E) Bottge, R. G., 1974, Potential mineral resources in selected D.2 lands: U.S. Bureau of Mines Open-File Report 9-74, 55 p.

(S,u) Bowsher, A. L., and Dutro, J. T., Jr., 1957, The Paleozoic section in the Shainin Lake area, central Brooks Range, Alaska: U.S. Geological Survey Professional Paper 303-A, pt. 3, p. 1-39. **** Naming paper for the Kanayut Conglomerate, Kayak Shale, Wachsmuth and Alapah Limestones; Lisburne Limestone raised to group rank. Includes eleven measured sections.

(E) Brooks, A. H., 1902, The coal reserves of Alaska: U.S. Geological Survey 22nd Annual Report, pt. 3, p. 515-571.

(E) Brooks, A. H., 1912, The mining industry in 1911: U.S. Geological Survey Bulletin 520, p. 42. **** Includes brief description of placer mining activity on the Squirrel River tributaries.

(E) Brooks, A. H., 1914, The mining industry in 1913: U.S. Geological Survey Bulletin 542, p. 72. **** Brief description of placer mining activity.

(E) Brooks, A. H., 1915, The Alaskan mining industry in 1914: U.S. Geological Survey Bulletin 622, p. 68. **** Brief description of placer mining activity.

(E) Brooks, A. H., 1916, The Alaskan mining industry in 1915: U.S. Geological Survey Bulletin 642, p. 71. **** Brief description of placer mining activity.

(E) Brooks, A. H., 1922, The Alaskan mining industry in 1920: U.S. Geological Survey Bulletin 722, p. 67. **** Brief description of placer mining activity.

(E) Brooks, A. H., 1923, The Alaskan mining industry in 1921: U.S. Geological Survey Bulletin 739, p. 44. **** Brief description of placer mining activity.

(E) Brooks, A. H., 1925, Alaska's mineral resources and production, 1923: U.S. Geological Survey Bulletin 733, p. 3-52. **** Brief description of placer mining activity.

(E) Brooks, A. H., and Capps, S. R., 1924, The Alaskan mining industry in 1919: U.S. Geological Survey Bulletin 755, p. 49. **** Brief description of placer mining activity.

(E) Brooks, A. H., and Martin, G. C., 1921, The Alaskan Mining industry in 1919: U.S. Geological Survey Bulletin 714, p. 559-95. **** For the Baird Mountains area, brief description of placer mining activity.

(A,S,E,r) Brosgé, W. P., 1960, Metasedimentary rocks in the south-central Brooks Range, Alaska, in Geological Survey Research 1960: U.S. Geological Survey Short Paper, p. B351-B352. **** Describes Paleozoic and some Mesozoic metasedimentary rocks of the Wiseman and eastern Survey Pass quadrangles. Discusses mineral occurrences and reports occurrence of cymrite from pyrite zone at Bonanza Creek.

(T) Brosgé, W. P., Dutro, J. T., Jr., and Gutman, S. I., 1983, Paleogeographic map of northern Alaska and northern Yukon at the end of Devonian time [abs.]: Alaska Geological Society Symposium, New developments in Paleozoic geology of Alaska and the Yukon, Program and Abstracts, Anchorage, Alaska, p. 16-17.

(S,a,u) Brosgé, W. P., Dutro, J. T., Jr., Mangus, M. D., and Reiser, H. N., 1962, Paleozoic sequence in the eastern Brooks Range, Alaska: American Association of Petroleum Geologists Bulletin, v. 46, no. 12, p. 2174-2198. **** New Middle-Late Devonian age for Skagit Limestone; measured type sections for two new formations: (1) Kekiktuk Conglomerate, (2) Wahoo Limestone. Also, thorough unit descriptions for Skajit limestone, overlying siltstone unit (Hunt Fork?), overlying sandstone unit (Noatak?), Kanayut Conglometate, Neruokpuk Formation, Kayak Shale, Wachsmuth Limestone, Alapah Limestone, Siksikpuk Formation and Sadlerochit Formation. Synthesis of upper Paleozoic unconformities.

(A,u,r) Brosgé, W. P., and Reiser, H. N., 1964, Geologic map of the Chandalar quadrangle, Alaska: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-375, scale 1:250,000. **** Named units include Bergman Group, Lisburne Group, Kayak Shale, Kanayut Conglomerate, and Skajit Limestone; some ages have since been refined.

(S,r) Brosgé, W. P., Reiser, H. N., Dutro, J. T., Jr., and Nilsen, T. H., 1979, Geologic map of Devonian rocks in parts of the Chandler Lake and Killik River quadrangles, Alaska: U.S. Geological Survey Open-File Report 79-1224, scale 1:200,000. ****

Incorporation of wacke member (Devonian shale and sandstone of Bowsher and Dutro, (1957) into Hunt Fork Shale.

(E,b) Brosgé, W. P., Reiser, H. N., and Tailleur, I. L., 1967, Copper analysis of selected samples, southwestern Brooks Range, Alaska: U.S. Geological Survey Open-File Report 274, 1 sheet, scale 1:1,000,000. **** Copper analyses for stream sediment and rock samples; includes general distribution of lithologies.

(S,r) Brosgé, W. P., and Tailleur, I. L., 1970, Depositional history of northern Alaska, _in_ Adkison, W. L., and Brosgé, M. M., eds., Geological seminar on the north slope of Alaska: American Association of Petroleum Geologists, Pacific Section, Proceedings, Menlo Park, California, p. D1-D17. **** Description of rocks and distribution of depositional facies for the Brooks Range and North Slope. Geologic history includes a Late Devonian deformational event. Mississippian rocks overlie an unconformity in the eastern Brooks Range, but are conformable in the west. Early Cretaceous deformation moved large allochthonous thrust plates northward, resulting in a disorderly arrangement of facies of Paleozoic rocks to the north of Jurassic mafic and ultramafic rocks, termed "disturbed belt".

(E,r) Bundtzen, T. K., and Henning, M. W., 1978, Barite in Alaska: Alaska Division of Geologic and Geophysical Surveys Mines and Geology Bulletin, v. 27, no. 4, p 1-3. **** Brief description of barite occurrences at Red Dog, Wulik, Drenchwater, and Atigun Canyon prospects in the Brooks Range. Bedded or nodular barite occurs in Mississippian and Permian shales and cherts.

(S,r,a) Campbell, R. H., 1967, Areal geology in the vicinity of the Chariot Site, Lisburne Peninsula, northwest Alaska: U.S. Geological Survey Professional Paper 395, 71 p. **** Detailed lithologic descriptions, measured sections, fossil tables, outcrop photographs and thin-section photomicrographs for the Nasorak, Kogruk, Tupik, Siksikpuk, Shublik, Ogotoruk, Telavarik, Kismilok and Fortress Mountain Formations. Describes relationships with statigraphically adjacent units, and evidence for facies analysis.

(M,b) Carden, J. C., 1978, The comparative petrology of blueschists and greenschists in the Brooks Range and Kodiak-Seldovia schist belts: unpublished Ph.D. thesis, University of Alaska, Fairbanks, 242 p. **** Evidence for a Precambrian blueschist event in the southwestern Brooks Range; detailed petrography, geobarometry, geothermometry, and chemistry; interpretation of protoliths.

(T,r) Carey, S. W., 1958, The tectonic approach to Continental drift, _in_ Continental Drift, a Symposium: Hobart, Tasmania, Tasmaina University, Geology Department, p. 177-355. **** Rotational opening of Arctic Alaska from the Canadian Arctic Archipelago.

(S,a) Carter, Claire, Churkin, Michael, Jr., Tailleur, I. L., and Pessel, G. H., 1973, Biostratigraphic record extended to Early Silurian or Ordovician in western Brooks Range: U.S. Geological Survey Professional Paper 850, p. 63-64. **** Graptolite ages.

(S,b,a) Carter, Claire, and Tailleur, I. L., 1984, Ordovician graptolites from the Baird Mountains, western Brooks Range, Alaska: Journal of Paleontology, v. 58, no. 1, p. 40-57. **** Early and Middle Ordovician graptolites in a phyllitic slate thought to conformably underlie the Baird Group carbonates. A lower age range for the base of Baird Group (previously Silurian and Devonian) is indicated.

(S,r,u) Chapman, R. M., Detterman, R. L., and Mangus, M. D., 1964, Geology of the Killik-Etivluk Rivers region, Alaska: U.S. Geological Survey Professional Paper 303-F, p. 325-407. **** Naming paper for the Hunt Fork Shale.

(W) Childers, J. M., and Kernodle, D. R., 1979, Water resources of the Noatak River Basin, in Johnson, K. M., and Williams, J. R., eds., The United States Geological Survey in Alaska--Accomplishments during 1978: U.S. Geological Survey Circular 804-B, p. B53-B54. **** Reports on temperature and flow rates on the Noatak River in April and August, 1978.

(W) Childers, J. M., Kernodle, D. R., and Loeffler, R. M., 1979, Hydrologic reconnaissance of western Arctic Alaska, 1976 and 1977: U.S. Geological Survey Open-File Report 79-699, 70 p. **** Rates of flow and water quality of the Noatak River between April and August.

(T,r) Churkin, Michael, Jr., 1973, Paleozoic and Precambrian rocks of Alaska and their role in its structural evolution: U.S. Geological Survey Professional Paper 740, 64 p. **** Enumerates Precambrian and Paleozoic rocks of Alaska, organized by time horizons. Very generalized, but shows regional distributions.

(S,a) Churkin, Michael, Jr., 1975, Geologic and paleogeographic setting of Paleozoic corals in Alaska: U.S. Geological Survey Professional Paper 823-A, p. 1-11. **** Summary and update of studies of Alaskan Paleozoic corals.

(E,r) Churkin, Michael, Jr., Huie, Carl, Mayfield, C. F., and Nokleberg, W. J., 1978, Geologic investigations of metallic mineral resources of southern NPRA, in Johnson, K. M., ed., The U.S. Geological Survey in Alaska--Accomplishments during 1977: U.S. Geological Survey Circular 722-B, p. 15-17. **** Regional setting for lead-zinc and barite deposits.

(E) Churkin, Michael, Jr., Mayfield, C. F., Theobald, P. K., Barton, H. N., Nokleberg, W. J., Winkler, G. R., and Huie, Carl, 1978, Geological and geochemical appraisal of metallic mineral resources, southern National Petroleum Reserve in Alaska: U.S. Geological Survey Open-File Report 78-70A, 82p. **** Summary of geochemical data; limited to small areas in southern NPRA.

(T,u,r) Churkin, Michael, Jr., Nokleberg, W. J., and Huie, Carl, 1979a, Collision-deformed Paleozoic continental margin, western Brooks Range, Alaska: Geology, v. 7, no, 8. p. 379-383. **** Naming of Kagvik sequence, a thrust sheet of internally imbricated Carboniferous through Cretaceous cherts and siliceous shales, in the western Brooks Range. Tectonic interpretation includes late Paleozoic subduction and both southward and northward thrusting in the late Mesozoic, associated with the rifting of the Canada basin. Comments and replies in Geology (Crane, R. C., Dutro, J. T., Mayfield, C. F., Metz, P. A., Mull, C. G., and Nelson, S. W.) point out that detailed mapping and stratigraphy by other workers do not support these interpretations.

(T) Churkin, Michael, Jr., Nokleberg, W. J., and Huie, Carl, 1979b, Tectonic model for the western Brooks Range, Alaska, in Johnson, K. M., and Williams, J. R., eds., The United States Geological Survey in Alaska--Accomplishments during 1978: U.S. Geological Survey Circular 804-B, p. B22-B25. **** Distillation of Churkin and others, 1979a.

(T,r) Churkin, Michael, Jr., and Trexler, J. H., Jr., 1981, Continental plates and accreted oceanic terranes in the Arctic, in Stehli, F. G., Nairn, A. E. M., and Churkin, Michael, Jr., eds., Ocean basins and margins, volume 5, The Arctic Ocean: Plenum Press, New York, p. 1-16. **** Application of terrane model to the Arctic Ocean basin, based on topography and generalized stratigraphy. Includes hypothesis of transcurrent motion along Kaltag-Porcupine lineaments, as well as global context of Arctic tectonostratigraphic terranes.

(T,r) Churkin, Michael, Jr., Whitney, J. W., and Rogers, J. F., 1984, Arctic paleogeography--Continental growth and fragmentation [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 275. **** Hypothesis that Arctic Alaska-Chukotka was a peninsula of North America separated from the Siberian Platform in Late Jurassic through Early Cretaceous time.

(E,b) Cobb, E. H., 1972, Metallic mineral resources of the Baird Mountains quadrangle, Alaska: U.S. Geological Survey Miscellaneous Field Studies Map 386, 1 sheet, scale 1:250,000. **** Compilation of lode (copper) and placer (gold) deposits in the Baird Mountains quadrangle, from a literature search.

(E,b) Cobb, E. H., 1973, Placer deposits of Alaska: U.S. Geological Survey Bulletin 1374, p. 57-58. **** Includes map, references, general description and history of base and precious metal exploration and placer mining in the Kiana district.

(E,b) Cobb, E. H., 1974, Copper occurences in Alaska: U.S. Geological Survey Mineral Resource Map 62, 1 sheet, scale 1:1,000,000. ****

Includes three copper occurrences in the Baird Mountains quadrangle, with references; no descriptions.

(E) Cobb, E. H., 1975, Summary of references to mineral occurrences (other than mineral fuels and construction materials) in northern Alaska: U.S. Geological Survey Open-File Report 75-628, 106 p. **** Compilation of mining and prospecting activity in the Brooks Range through 1973; data on character of, and reported values for, base and precious metal mineralization. Predominantly placer mining in Baird Mountains.

(E) Cobb, E. H., Mayfield, C. F., and Brosgé, W. P., 1981a, Summaries of data on lists of references to metallic and selected non-metallic mineral occurrences in eleven quadrangles in northern Alaska, Supplement to Open-File Report 75-628; Part A--Summaries of data to January 1, 1981: U.S. Geological Survey Open-File Report 81-767A, p. A1-A24. **** List of all known mineral occurences through January 1981, including minor occurrences, float, and reported occurrences. Report includes location, description, and references for each occurrence.

(E) Cobb, E. H., Mayfield, C. F., and Brosgé, W. P., 1981b, Summaries of data on lists of references to metallic and selected non-metalic mineral occurrences in eleven quadrangles in northern Alaska, Supplement to Open-File Report 75-628; Part B--Lists of references to January 1, 1981: U.S. Geological Survey Open-File Report 81-767B, p. B1-B14.

(S,T,u) Crane, R. C., and Wiggins, V. D., 1976, Ipewick Formation, significant Jurassic-Neocomian map unit in northern Brooks Range fold belt [abs.]: American Association of Petroleum Geologists Bulletin, v. 60, no. 12, p. 2177. **** The Ipewick Formation is named for clay shales, red shales, bituminous shales, coquinoid limestone, and quartz sandstone in the central and western Arctic region. A quiescent, lagoonal depositional environment is suggested.

(A,a) Curtis, S. M., Ellersieck, Inyo, Mayfield, C. F., and Tailleur, I. L., 1982, Reconnaissance geologic map of southwestern Misheguk Mountain quadrangle, Alaska: U.S. Geological Survey Open-File Report 82-611, scale 1:63,360. **** Map and fossil tables. Map explanation includes generalized regional interpretations. Cross-sections are generalized and schematic.

(A,a) Curtis, S. M., Ellersieck, Inyo, Mayfield, C. F., and Tailleur, I. L., 1983, Reconnaissance geologic map of the De Long Mountains A1, B1, and part of C1 quadrangles, Alaska: U.S. Geological Survey Open-File Report 83-185, 53 p., scale 1:63,360. **** Map, schematic cross-sections, fossil tables, brief unit descriptions and generalized regional geologic history. The geologic history is presented in terms of allochthons, or thrust sheets with unique internal stratigraphy. Text identical to OF 83-183 and OF 83-184.

(E,P) Curtis, S. M., Rossiter, Richard, Ellersieck, I. F., Mayfield, C. F., and Tailleur, I. L., 1979, Gamma-ray values in the Misheguk Mountain region and in parts of Barrow, Teshekpuk, and Harrison Bay quadrangles, Alaska, in Johnson, K. M., and Williams, J. R., eds., The United States Geological Survey in Alaska--Accomplishments during 1978: U.S. Geological Survey Circular 804-B, p. B14. **** Note on anomaly measured by scintillometer in Maiyumerak Mountains, 67° 12'N, 161° 35'W.

(E) Dall, W. H., 1896, Report of coal and lignite of Alaska: U.S. Geological Survey 17th Annual Report, pt. 1, p. 763-908. **** Coal on the Kobuk River.

(T) DeSautels, D. A., 1985, Geotectonic evolution of Bering Sea area, Alaska [abs.]: American Association of Petroleum Geologists Bulletin, v. 69, no. 2, p. 249. **** Model for Mesozoic and early Cenozoic tectonic setting for deposition and deformation in western Alaska.

(G,r) Decker, John, and Dillon, J. T., 1984, Interpretation of regional aeromagnetic signatures along the southern margin of the Brooks Range, Alaska [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 278. **** Mirrored aeromagnetic signatures across Koyukuk Basin. Interpretation of aeromagnetic data links Brooks Range and Seward Peninsula.

(G) Decker, John, and Karl, Susan, 1977, Preliminary aeromagnetic map of the Brooks Range and Arctic slope, Alaska: U.S. Geological Survey Open-File Report 77-166E, 1 sheet, scale, 1:1,000,000. **** Sparse data, but covers eastern, southern and northwestern portions of the Baird Mountains quadrangle.

(E,b) Degenhart, C. E., Griffis, R. J., McOuat, J. F., and Bigelow, C. G., 1978, Mineral studies of certain ANCSA 17 (d)(2) lands in Alaska, volume 1: U.S. Bureau of Mines Open-File Report 103-78, 546 p. **** This report first signals the Red Dog prospect as an extensive Pb-Zn-Ba deposit of outstanding merit. Also includes descriptions of mineral occurrences and data from sampling programs of the known prospects in the Baird Mountains quadrangle. The geology of the western Brooks Range is considered sufficiently favorable to warrant systematic regional, and detailed local mineral exploration.

(S,r) Detterman, R. L., 1956, New and redefined nomenclature of Nanushuk Group, in Gryc, George, and others, eds., Mesozoic sequence in Colville River region, northern Alaska: American Association of Petroleum Geologists Bulletin, v. 40, no. 2, p. 233-244.

(S) Detterman, R. L., 1970, Sedimentary history of the Sadlerochit and Shublik Formations in northeastern Alaska, in Adkinson, W. L., and Brosgé, M. M., eds., Proceedings of the geological seminar on the North Slope of Alaska: American Association of Petroleum Geologists, Pacific Section, Los Angeles, California, p. 1-13.

**** Context for Mesozoic depositional environment in Brooks Range.

(S) Detterman, R. L., Reiser, H. N., Brosgé, W. P., and Dutro, J. T., Jr., 1975, Post-Carboniferous stratigraphy, northeastern Alaska: U.S. Geological Survey Professional Paper 886, 46 p.

(T,E,a) Dillon, J, T., Pessel, G. H., Chen, J. H., and Veach, N. C., 1978, Tectonic and economic significance of Late Devonian and late Proterozoic U-Pb Zircon ages from the Brooks Range, Alaska: Alaska Division of Geological and Geophysical Surveys Geologic Report 61, p. 36-41. **** Reports new dates from felsic metavolcanic rocks (Ambler River and Wiseman quadrangles) and felsic plutonic rocks (Survey Pass and Wiseman quadrangles) and discusses geologic implications.

(T,a) Dillon, J. T., Pessel, G. H., Chen, J. H., and Veach, N. C., 1980, Middle Paleozoic magmatism and orogenesis in the Brooks Range, Alaska: Geology, v. 8, no. 7, p. 338-343. **** U-Pb, Pb-Pb, Rb-Sr, and K-Ar ages for late Proterozoic and middle Devonian plutons in southcentral Brooks Range, Mesozoic metamorphic overprint.

(S,r) Dillon, J. T., and Smiley, C. J., 1984, Clasts from the Early Cretaceous Brooks Range orogen in Albian to Cenomanian molassse deposits of the northern Koyukuk Basin, Alaska [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 279. **** South-directed paleocurrents in Cretaceous sediments on south flank of Brooks Range.

(S,r) Donovan, T. J., and Tailleur, I. L., 1975, Map showing paleocurrent and clast size data from the Devonian-Mississippian Endicott Group, northern Alaska: U.S. Geological Survey Miscellaneous Geologic Field Studies Map MF-692, scale 1:1,000,000. **** Map shows general distribution of Endicott Group, paleocurrent data, and maximum clast size of vein quartz. Interpretation of tectonic history, depositional environment, and source terrane is unclear.

(S,b,a) Dumoulin, J. A., and Harris, A. G., 1985, Lower Paleozoic carbonate rocks of the Baird Mountains quadrangle, Alaska [abs.]: American Association of Petroleum Geologists Bulletin, vol. 69, no. 4, p. 662. **** New Middle and Upper Cambrian ages for carbonate rocks in the Baird Mountain quadrangle. Ordovician, Silurian, and Devonian carbonates also briefly described.

(S,a) Dutro, J. T., Jr., 1952, Stratigraphy and paleontology of the Noatak and associated formations, Brooks Range, Alaska: U.S. Geological Survey, Geological Investigations Naval Petroleum Reserve Number 4, Special Report 33, 144 p.

(S,u,a) Dutro, J. T., Jr., 1953, Stratigraphy and paleontology of the Noatak and associated formations, Brooks Range, Alaska: Geological Society of America Bulletin, v. 64, no. 12, p. 14-

15. **** The Noatak Formation of P. S. Smith is subdivided and restricted to Upper Devonian and Lower Mississippian marine clastic rocks.

(S,r,a) Dutro, J. T., Jr., 1961, Correlation of Arctic Permian: U.S. Geological Survey Professional Paper 424-C, p. 225-228. **** Correlation of Permian formations of northwest Alaska and the Arctic with Permian rocks elsewhere in North America, Norway, and the USSR.

(S,T,r) Dutro, J. T., Jr., 1981, Geology of Alaska bordering the Arctic Ocean, in Stehli, F. G., Nairn, A. E. M., and Churkin, Michael, Jr., eds., Ocean basins and margins, volume 5, The Arctic Ocean: Plenum Press, New York, p. 21-36. **** Brooks Range stratigraphy, focussing on depositional environments and major unconformities. Tectonic model includes rifting and transforms associated with the Lomonosov Ridge.

(S,r) Dutro, J. T., Jr., and Armstrong, A. K., 1970, Biostratigraphy of Carboniferous of northern Alaska [abs.]: American Association of Petroleum Geologists Bulletin, v. 54, no. 12, p. 2478.

(T,r) Dutro, J. T., Jr., Brosgé, W. P., Lanphere, M. A., and Reiser, H. N., 1976, Geological significance of the Doonerak structural high, central Brooks Range, Alaska: American Association of Petroleum Geologists Bulletin, v. 60, no. 6, p. 952-961. **** Two hypotheses are presented for oppositely dipping thrust faults flanking Doonerak: (1) a single thrust fault drapes a structural window, and (2) a southward-directed thrusting event preceded the northward-directed thrusting event.

(S,u,a) Dutro, J. T., Jr., Brosgé, W. P., Reiser, H. N., and Detterman, R. L., 1978, Beaucoup Formation, a new Upper Devonian stratigraphic unit in the central Brooks Range, northern Alaska: U.S. Geological Survey Bulletin 1482-A, p. A63-A69. **** Naming paper for the Beaucoup Formation; includes lithologic description and measured section.

(S) Dutro, J. T., Jr., Lachenbruch, M. C., and Lachenbruch, A. H., 1951, Stratigraphy and structure of the western Noatak District, Alaska: U.S. Geological Survey, Geological Investigations Naval Petroleum Reserve Number 4, Alaska, Report 39, 26 p.

(S,a) Dutro, J. T., Jr., Palmer, A. R., Repetski, J. E., Jr., and Brosgé, W. P., 1984a, The Doonerak anticlinorium revisited, in Coonrad, W. L., and Elliot, R. L., eds., The United Stated Geological Survey in Alaska--Acomplishments during 1981: U.S. Geological Survey Circular 868, p. 17-19. **** Middle Cambrian fauna from carbonates at Mount Doonerak. More complete presentation of data in Dutro and others, 1984b.

(S,a) Dutro, J. T., Jr., Palmer, A. R., Repetski, J. E., Jr., and Brosgé, W. P., 1984b, Middle Cambrian fossils from the Doonerak anticlinorium, central Brooks Range, Alaska: Journal of

Paleontology, v. 58, no. 6, p. 1364-1371. **** Photographs, systematic paleontology.

(E,b) Ellersieck, Inyo, Blanchard, D. C., Mayfield, C. F., and Tailleur, I. L., 1984, Kivivik Creek--A possible zinc-lead-silver occurrence in the Kuna Formation, western Baird Mountains, Alaska, in Coonrad, W. L. and Elliott, R. L., eds., U.S. Geological Survey in Alaska--Accomplishments during 1981: U.S. Geological Survey Circular 868, p. 16-17. **** Report of high stream-sediment geochemical values in copper, lead, zinc, and silver, from Kivivik Creek.

(A) Ellersieck, Inyo, Curtis, S. M., Mayfield, C. F., and Tailleur, I. L., 1982, Reconnaissance geologic map of the south-central Misheguk Mountain quadrangle, Alaska: U.S. Geological Survey Open-File Report 82-612, scale 1:63,360.

(A,a) Ellersieck, Inyo, Curtis, S. M., Mayfield, C. F., and Tailleur, I. L., 1983, Reconnaissance geologic map of the De Long Mountains A2, B2, and part of C2 quadrangles, Alaska: U.S. Geological Survey Open-File Report 83-184, 53 p., scale 1:63,360. **** Map, schematic cross-sections, fossil tables, brief unit descriptions, and generalized geologic history in terms of the seven allochthon model, which represents seven thrust sheets, each having a unique stratigraphic sequence. Text identical to OF 83-183 and OF 83-185.

(E,r) Ellersieck, Inyo, Jansons, Uldis, Mayfield, C. F., and Tailleur, I. L., 1982, The Story Creek and Whoopee Creek lead-zinc-silver occurrences, western Brooks Range, Alaska, in Coonrad, W. L., ed., United States Geological Survey in Alaska--Accomplishments during 1980: U.S. Geological Survey Circular 844, p. 35-37. **** Locality description and geologic context with respect to other Pb-Zn-Ag deposits in the western Brooks Range.

(T) Ellersiek, I. F., and Mayfield, C. F., 1984, The western Brooks Range, Alaska--Too much crust [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 281. **** Unstacking of thrust sheets suggests Arctic Alaska Basin extended at least 50 km and possibly more than 200 km south of its present position.

(S,T) Ellersieck, Inyo, Mayfield, C. F., Tailleur, I. L., and Curtis, S. M., 1979, Thrust sequences in the Misheguk Mountain quadrangle, Brooks Range, Alaska, in Johnson, K. M., and Williams, J. R., dds., The Unites States Geological Survey in Alaska--Accomplishments during 1978: U.S. Geological Survey Circular 804-B, p. B8. **** Generalized lithologic columns for seven western Brooks Range thrust sequences, and estimate of 500 km shortening from palinspastic reconstruction to the present configuration.

(Q,r) Fernald, A. T., 1964, Surficial geology of the central Kobuk River valley, northwestern Alaska: U.S. Geological Survey Bulletin

1181-K, p. K1-K31. **** Glacial, dune, and terrace deposits described and interpreted. Composition of sand from dunes reported.

(T,r) Fisher, M. A., Patton, W. W., Jr., and Holmes, M. L., 1982, Geology of Norton Basin and continental shelf beneath northwestern Bering Sea, Alaska: American Association of Petroleum Geologists Bulletin, v. 66, no. 3, p. 255-285. **** Includes a comparison of the igneous and metamorphic histories of the Brooks Range and the Seward Peninsula.

(T,M,b) Forbes, R. B., Carden, J. R., and Turner, D. L., 1977, Regional tectonic implications of blueschist terranes, in Sisson, A., ed., The relationship of plate tectonics to Alaskan geology and resources: Proceedings of Alaska Geological Society Symposium, p. C1-C7. **** Brief mention of blueschist facies minerals in Baird Mountains.

(S,E,a) Forbes, R. B., Evans, Bernard, Thurston, S. P., and Armstrong, R. L., 1984, Comparitive Rb/Sr-K/Ar age data from the Seward Peninsula and Brooks Range, Alaska blueschist terranes--A progress report [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 284. **** New Rb/Sr and K/Ar data from the Baird Mountains quadrangle reinforce previous Proterozoic mineral ages.

(Mb) Forbes, R. B., Hamilton, T. D., Tailleur, I. L., Miller, T. P., and Patton , W. W., 1971, Tectonic implications of Blueschist facies metamorphic terranes in Alaska: Nature, v. 234, p. 106-108. **** Discusses Alaskan blueschist occurrences and attempts to correlate those of the Baird Mountains quadrangle with others of the Seward Peninsula, Kaiyuh Mountains, Seldovia and eastern USSR.

(A,E,m) Forbes, R. B., Turner, D. L., Gilbert, W. G., and Carden, J. R., 1973, Ruby Ridge traverse, southwestern Brooks Range, Alaska: Alaska Division of Geological and Geophysical Surveys 1973 Annual Report, p. 34-36. **** Mapping progress in the Ambler River quadrangle.

(E,r) Forrest, Kimball, Sawkins, F. J., and Rye, R. O., 1984, The Lik deposit, western Brooks Range, Alaska--Sedex mineralization along axial vent sites in a structural basin [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 6, p. 511. **** Geologic and isotopic evidence for source of Ag, Pb, Zn mineralization in the Kuna Formation at the Lik deposit, interpreted to be chemical precipitation of metals and sulfides from vented hydrothermal fluids in a euxinic basin.

(A,I) Frank, C. O., and Zimmerman, Jay, 1982, Petrography of ultramafic rocks from the Avan Hills complex, De Long Mountains, Alaska, in Coonrad, W. L., ed., The United States Geological Survey in

Alaska--Accomplishments during 1980: U.S. Geological Survey Circular 844, p. 22-27. **** Petrographic description of non-ultramafic rocks within the Avan hills ultramafic complex.

(T,r) Freeland, G. L., and Dietz, R. S., 1973, Rotation history of Alaskan tectonic blocks: Tectonophysics, v. 18, p. 379-389.

(A,r) Fritts, C. E., 1969, Geology and geochemistry in the southeastern part of the Cosmos Hills, Shungnak D-2 quadrangle, Alaska: Alaska Division of Mines and Geology Report 37, 35 p., scale 1:48,000. **** Report on an area which includes felsic plutons, mafic volcanic and mid-Paleozoic metasedimentary rocks which are probably correlative with similar lithologies of the Baird Mountains quadrangle.

(A,E) Fritts, C. E., 1970, Geology and geochemistry of the Cosmos Hills, Ambler River, and Shungnak quadrangles, Alaska: Alaska Division of Mines and Geology Report 39, 69 p., scale 1:63,360. **** Report on lithologies and mineralization of Paleozoic and Mesozoic rocks that are similar to rocks in the Baird Mountains quadrangle.

(Q) Galloway, J. P., Oscarson, R., and Koster, E. A., 1984, Scanning electron microscope microfeatures on sand grains and carbonate crusts from the Great Kobuk Sand Dunes, Kobuk River Valley, northwestern Alaska [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 285. **** Evidence for sand grains in Kobuk Sand Dunes originating from both glaciofluvial and eolian processes.

(A,E) Gilbert, W. G., Wiltse, M. A., Carden, J. R., Forbes, R. B., and Hackett, S. W., 1977, Geology of Ruby Ridge, southwestern Brooks Range: Alaska Division of Geological and Geophysical Surveys Geologic Report 58, scale 1:31,680, 16 p. **** Describes petrology and structure of an area of greenschist and blueschist facies rocks which hosts massive sulfide mineralization east of the Baird Mountains quadrangle, in the Ambler River quadrangle.

(T,r) Gordey, S. P., 1981, Stratigraphy, structure and tectonic evolution of southern Pelly Mountains in the Indigo Lake area, Yukon Territory: U.S. Geological Survey Bulletin 318, 44 p. **** Possible structural analog for the Brooks Range allochthon model (Mayfield and others, 1983), located in the Yukon Territory.

(T,r) Gottschalk, R. R., Avé Lallemant, H. G., and Oldow, J. S., 1984, Structural and petrologic evolution of the southern Brooks Range near Coldfoot, Alaska [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 287. **** Three phases of folding in quartz-mica schists, but two phases of folding affect the Angayuchum Terrane basalts and radiolarian cherts.

(T,r) Grantz, Arthur, Eittriem, Steve, and Dinter, D. A., 1979, Geology and tectonic development of the continental margin north of Alaska: Tectonophysics, v. 59, p. 263-291. **** Amplification of the rifting theory for the Canada Basin, using geophysical, structural and geologic data. Proposed identification of the Northwind and Camden Fracture Zones which divide the Barter Island, Barrow, and Chukchi sectors of the northern Alaska margin.

(T,r) Grantz, Arthur, Eittrem, Steve, and Whitney, O. T., 1981, Geology and physiography of the continental margin north of Alaska and implications for the origin of Canada Basin, in Stelhi, F. G., Nairn, A. E. M., and Churkin, Michael, Jr., eds., Ocean basins and margins, volume 5, The Arctic Ocean: Plenum Press, New York, p. 439-489. **** Regional physiographical and geological description and interpretation. Includes hypothesis that Brooks Range is a foreland thrust belt resulting predominantly from subduction on the south side, with complementry opening of the Canada Basin on the north.

(T) Grantz, Arthur, and May, S. D., 1985, Implications of offshore northern Alaska geology for origin of Canada Basin, Arctic Ocean [abs.]: American Association of Petroleum Geologists Bulletin, v. 69, no. 2, p. 259. **** Rift model for early Jurassic opening of the Canada Basin. Local Neocomian and Paleogene extension within the north Chukchi Basin.

(T) Grantz, Arthur, May, S. D., and Marinai, Robert, 1984, Tectonic implications of the Phanerozoic paleogeography of offshore Arctic Alaska [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 287. **** Magnetic anomaly west of Cape Lisburne may be serpentinite marking an Alaska-Siberia suture. Wrangel Island rocks resemble Brooks Range nappes and may be thrust over autocthonous basins in the Chukchi Sea.

(S,T,a) Grantz, Arthur, Tailleur, I. L., and Carter, Claire, 1983, Tectonic significance of Silurian and Ordovician graptolites, Lisburne Hills, northwest Alaska [abs.]: Geological Society of America Abstracts with Programs, v. 15, no. 5, p. 274. **** Graptolites are used to correlate Ordovician and Silurian rocks of Lisburne Hills with parautochthanous rocks of the Brooks Range.

(E) Grybeck, Donald, 1977a, Known mineral deposits of the Brooks Range Alaska: U.S. Geological Survey Open-File Report 77-166C, 45 p., 1 sheet, scale 1:1,000,000. **** Map showing location, type and relative size of mineral deposits; table includes brief description and references for each deposit.

(E,r) Grybeck, Donald, 1977b, Map showing geochemical anomalies in the Brooks Range, Alaska: U.S. Geological Survey Open-File Map 77-166D, 1 sheet, scale 1:1,000,000. **** Map shows location of stream sediment anomolies, sample density, and land status.

(A,a,r) Grybeck, Donald, Beikman, H. M., Brosgé, W. P., Tailleur, I. L., and Mull, C. G., 1977, Geologic map of the Brooks Range, Alaska: U.S. Geological Survey Open-File Map 77-166B, 2 sheets, scale: 1:1,000,000. **** Very generalized geologic map with rock units defined by age. Includes map showing the distribution of metamorphic rocks and the locations of radiometrically dated samples.

(E,r) Grybeck, Donald, and DeYoung, J. H., Jr., 1978, Map and tables describing mineral resource potential of the Brooks Range, Alaska: U.S. Geological Survey Open-File Report 78-1-B, 20 sheets, scale 1:1,000,000. **** Generalized map showing areas favorable for specific mineral deposit types, and status of private, state, and federal work with respect to mineral resource assessment of the Brooks Range.

(E) Grybeck, Donald, and Nokleberg, W. J., 1979, Metallogeny of the Brooks Range, Alaska, in Johnson, K. M., and Williams, J. R., eds., The United States Geological Survey in Alaska--Accomplishments during 1978: U.S. Geological Survey Circular 804-B, p. B19-B22. **** Deposits fall into categories associated with 6 categories of Paleozoic rocks which include (1) stratiform, volcanogenic Cu-Zn deposits in meta-rhyolites, (2) Cu-Zn-Ag deposits in carbonates, (3) Sn-Mo-W-Pb-Zn-Ag-Sb, U deposits in Paleozoic granites, (4) Zn-Pb-Ba-Ag deposits in Mississippian black chert and shale associated with volcanic rocks, (5) porphyry Mo, Cu, and Skarn deposits in a belt of granitic plutons, and (6) gold placers derived from quartz veins in Devonian or older rocks.

(S,u) Gryc, George, Patton, W. W., Jr., and Payne, T. G., 1951, Present Cretaceous stratigraphic nomenclature of northern Alaska: Washington Academic Science Journal, v. 41, no. 5, p. 159-167. **** Naming paper for the Cretaceous Okpikruak Formation.

(G) Hackett, S. W., 1977, Aeromagnetic map of southwestern Brooks Range, Alaska: Alaska Division of Geological and Geophysical Surveys, Geological Report 56, 2 sheets, scale 1:250,000. **** Includes only eastern two thirds of the Baird Mountains quadrangle.

(G) Hackett, S. W., 1980, Aeromagnetic interpretation maps of the Ambler River quadrangle, Alaska: U.S. Geological Survey Open-File Report 78-120K, 19 p., 3 sheets, scale 1:250,000.

(Q) Hamilton, T. D., 1983, Glaciation of the Brooks Range, in Thorson, R. M., and Hamilton, T. D., eds., Glaciation in Alaska: Alaskan Quaternary Center, University of Alaska Museum Occasional Paper No. 2, p. 35-41. **** Late pre-Pleistocene and Pleistocene history of glaciation in the Brooks Range.

(Q) Hamilton, T. D., 1984a, Late quaternary offsets along the Kobuk and related fault zones, northwestern Alaska [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 288. **** Vertical E-W faults along Kobuk Valley extend at least from Bettles to Kotzebue and have been offset as much as 2 m in the last 20,000 years.

(Q) Hamilton, T. D., 1984b, Surficial Geologic Map of the Ambler River quadrangle, Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-1678, scale 1:250,000.

(Q) Hamilton, T. D., and van Etten, D. P., 1984, Late Pleistocene glacial dams in the Noatak Valley, in Coonrad, W. L., and Elliott, R. L., The United Stated Geological Survey in Alaska--Accomplishments during 1981: U.S. Geological Survey Circular 868, p. 21-23. **** Evidence for, and implications of proglacial lakes that formed during two late Pleistocene glacial episodes, and extended into the northern Baird Mountains.

(T,r) Hamilton, W., 1968, Continental Drift in the Arctic [abs.]: Geological Society of America, Codilleran Section, Annual Meeting, Tuscon, Arizona, p. 61. **** Rotation of Arctic Alaska away from Canadian Arctic Archipelago in the Late Mesozoic. Oroclinal folding began Late Jurassic or Early Cretaceous.

(T,r) Harbert, W. P., Frei, L. S., Cox, Allan and Engebretson, D. C., 1984, Relative motions between Eurasia and North America in Bering Sea region [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 6, p. 529. **** Major plate motions indicate Maestrichtian to Paleocene compressive deformation between northern Alaska and the Chukotsk Peninsula.

(M,S,r) Harris, A. G., Ellersieck, Inyo, Mayfield, C. F. and Tailleur, I. L., 1983, Thermal maturation values (conodont color alteration indices) for Paleozoic and Triassic rocks, Chandler Lake, De Long Mountains, Howard Pass, Killik River, Misheguk Mountain, and Point Hope Alaska, and subsurface NPRA: U.S. Geological Survey Open-File Report 83-505, 15 p.

(E) Harrover, R. D., and Norman, D. I., 1980, Stable oxygen isotope and crystalline size analysis of Alaskan cherts--An exploration tool for submarine exhalative deposits [abs.]: Geological Society of America Abstracts with Programs, v. 12, no. 7, p. 530. **** Study of cherts at the Red Dog and Lik mineral deposits.

(S) Hawley, C. C., 1976, Exploration and distribution of stratiform sulfide deposits in Alaska: in Miller, T. P., ed., Recent and ancient sedimentary environments in Alaska, Proceedings of the Alaska Geological Society Symposium, p. T1-T23. **** General synthesis, interpretation, and classification of stratiform sulfide deposits in Alaska, including the schist belt of the Brooks Range.

(E) Heide, H. E., Wright, W. S., and Rutledge, F. A., 1949, Investigations of the Kobuk River asbestos deposits, northwestern Alaska: U.S. Bureau of Mines Report on Investigations 4414, 25 p. **** Reports asbestos occurrences in mafic/ultramafic rocks in the Ambler River and Shungnak quadrangles.

(A,E,r) Hill, K., 1985, Geology of the Sunshine Creek prospect, Ambler District, Alaska: unpublished M.S. thesis, University of Alaska, Fairbanks. **** Describes one of the volcanogenic massive sulfide deposits in the Brooks Range schist belt (Ambler River quadrangle).

(A,E,r) Hitzman, M. W., 1978, Geology of the BT claim group, southwestern Brooks Range, Alaska: unpublished M.S. thesis, University of Washington, Seattle, 80 p. **** Describes one of the volcanogenic massive sulfide deposits of the Ambler District (Survey Pass quadrangle) in the Brooks Range schist belt.

(M,r) Hitzman, M. W., 1982, Metamorphic petrology of the southwestern Brooks Range, Alaska [abs.]: Geological Society of America Abstracts with Programs, v. 14, no. 4, p. 173. **** Describes metamorphic history of a small portion of the Brooks Range schist belt (Ambler River and Survey Pass quadrangles).

(E,r) Hitzman, M. W., Smith, T. E., and Proffett, J. M., 1983a, Ambler schist belt of northwest Alaska--Host terrane for world class massive sulfide deposits [abs]: Alaska Geological Society, proceedings of the 1982 Symposium, Western Alaska Geology and Resource Potential, Anchorage, Alaska, p. 42-44. **** Upper Devonian U-Pb ages for bimodal volcanic suite which is interpreted to be a rifted margin assemblage. Stratiform massive sulfides are associated with felsic meta-volcanic rocks and associated meta-sediments.

(A,E,r) Hitzman, M. W., 1983b, Geology of the Cosmos Hills and its relationship to the Ruby Creek copper-cobalt deposit: unpublished Ph.D. dissertation, Stanford University, California, 266 p., 5 plates, scale 1:24,000 and 1:12,000. **** Discusses origin and setting of a large, unique mineral deposit hosted in Devonian carbonates lithologically similar to those of the Baird Mountains.

(T,r) Hitzman, M. W., 1984, Geology of the Cosmos Hills--Constraints for Yukon-Koyokuk Basin evolution [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 290. **** Extensional tectonic environment interpreted for southern Brooks Range rocks in Devonian time. Post-extensional northward thrusting truncates metamorphic mineral zonation.

(T,r) Hitzman, M. W., and Proffet, J. M., 1980, Devonian to Recent tectonics of the southwestern Brooks Range, Alaska [abs.]: Geological Society of America Abstacts with Programs, v. 12, no. 7, p. 447. **** Devonian rifted margin first deformed by north to south directed compression in middle Mesozoic time, with synkinematic high greenschist facies and blueschist facies metamorphism. Second deformation in Cretaceous time involves Devonian to Jurassic oceanic crust thrust northward, accompanied by low greenschist facies metamorphism.

(A,r) Hitzman, M. W., Smith, T. E., and Proffet, J. M., 1982, Bedrock geology of the Ambler District, southwestern Brooks Range, Alaska: Alaska Division of Geological and Geophysical Surveys

Geologic Report 75, 2 plates, scale 1:250,000. **** Detailed division of rock units in the schist belt accentuate metamorphic protoliths. Map units differ from those of previous workers.

(S) Hollick, Arthur, 1936, The Tertiary floras of Alaska, with a chapter on the geology of the Tertiary deposits, by P. S. Smith: U.S. Geological Survey Professional Paper 182, p. 31-34. **** Description of Tertiary coal-bearing sandstone and conglomerate on the Kobuk River.

(S,r,a) Imlay, R. W., 1955, Characteristic Jurassic mollusks from northern Alaska: U.S. Geological Survey Professional Paper 274-D, p. 69-96. **** Jurassic rocks divided into 3 lithologic facies: (1) coarse clastic facies, (2) shale and siltstone facies, and (3) glauconitic calcareous sandstone, siltstone and shale facies. Photographs and systematic paleontology for Jurassic megafossil collections.

(S,a) Imlay, R. W., 1961, Characteristic Lower Cretaceous megafossils of northern Alaska: U.S. Geological Survey Professional Paper 335, 74 p. **** Ages for Okpikruak, Fortress Mountain, Torok, Ninukluk Formations, with interpretation of depositional environments.

(S,a) Imlay, R. W., 1967, The Mesozoic pelecypods Otapiria-Marwick and Lupherella-Imlay new genus, in the United States: U.S. Geological Survey Professional Paper 573-B, 11 p. **** Triassic and Jurassic fossils in northcentral and northwestern Brooks Range described.

(S,a) Imlay, R. W., and Detterman, R. L., 1973, Jurassic paleobiogeography of Alaska: U.S. Geological Survey Professional Paper 801, 34 p. **** Maps showing distribution of Jurassic fossils by stage. Correlation charts for Jurassic rocks in Alaska. Ammonites have Boreal rather than Tethyan affinities.

(E,b) Jansons, Uldis, 1982, Cobalt content in samples from the Omar copper prospect, Baird Mountains, Alaska: U.S. Bureau of Mines Open File Report MLA 109-82, 16 p. **** Presentation of data.

(E) Jansons, Uldis, and Baggs, D. W., 1980, Mineral investigations of the Misheguk Mountain and Howard Pass quadrangles, National Petroleum Reserve, Alaska: U.S. Bureau of Mines Open-File Report 38-80, 76 p. **** Geochemical data from detailed stream and rock sampling programs at 18 sites determined to have mineral potential during a regional reconnaissance program in 1977.

(E) Jansons, Uldis, and Parke, Mary Ann, 1981, 1978 mineral investigations in the Misheguk Mountain and Howard Pass quadrangles, Alaska: U.S. Bureau of Mines Open-File Report 26-81, 198 p. **** Follow-up of U.S.G.S. geochemical survey reported in OF78-70A. Presentation of stream sediment, soil and rock geochemical data.

(S,T,a) Jones, D. L., and Grantz, Arthur, 1964, Stratigraphic and structural significance of Cretaceous fossils from Tiglukpuk Formation, northern Alaska: American Association of Petroleum Geologists Bulletin, v. 48, no. 9, p. 1462-1474. **** The Tiglukpuk Formation contains Buchia Sublaevis, and is thus of Early Cretaceous rather than Jurassic age. The rocks are younger than those of the Okpikruak Formation, though structurally beneath them. This major age revision is the basis for abandoning the term Tiglukpuk Formation.

(T) Jones, R. W., 1968, Overthrusting in the central Brooks Range, Arctic Alaska [abs.]: Geological Society of America Cordilleran Section Meeting, p. 70. **** Evidence for large scale imbricate thrusting; the faults young from south to north, and possibly also young from west to east.

(T,r) Jones, D. L., Silberling, N. J., Berg, H. C., and Plafker, George, 1981, Map showing tectonostratigraphic terranes of Alaska, columnar sections, and summary description of terranes, U.S. Geological Survey Open-File Report 81-792, 19 p. **** Angayuchum terrane named. Other terranes of Brooks Range include North Slope, Kagvik, Endicott, and Ruby terranes. Revised in Jones and others, 1984, OF 84-523.

(T,r) Jones, D. L., Silberling, N. J., Coney, P. J., and Plafker, George, 1984, Lithotectonic terrane map of Alaska (west of the 141st Meridian): U.S. Geological Survey Open-File Report 84-523, p. A1-A12. **** Revised terranes of the Brooks Range include the Arctic Alaska terrane, consisting of the Coldfoot, De Long Mountains, Hammond, and North Slope subterranes, as well as the Ruby and Angayuchum terranes.

(T) Julian, F. E., Phelps, J. S., Seidensticker, C. M., Oldow, J. S., and Avé Lallemant, H. G., 1984, structural history of the Doonerak Window, central Brooks Range, Alaska [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 291. **** Evidence for a Devonian deformational event and three later events. The second of these later events involved major thrusting.

(S,a) Keller, A. S., Morris, R. H., and Detterman, R. L., 1961, Geology of the Sagavanirktok River region, Alaska, <u>in</u> Areal geology, Exploration of Naval Petrolium Reserve Number 4 and adjacent areas, northern Alaska: U.S. Geological Survey Professional Paper 303-D, p. 169-222. **** Includes age and source terrane, depositional environment, and petroleum potential of the Okpikruak Formation.

(T,a) Kelley, J. S., Brosgé, W. P., and Reynolds, M. W., 1985, Fold nappes and polyphase thrusting in the north-central Brooks Range, Alaska: American Association of Petroleum Geologists Abstracts with Programs, p. 667. **** Identification of stratigraphically controlled detachment surfaces, and detailed analysis of mechanisms of thrusting in the north-central Brooks Range.

(T,a) Kelley, J. S., and Molenaar, C. M., 1985, Detachment tectonics in the Sadlerochit and Shublik Mountains and applications for exploration beneath the coastal plain of northeastern Alaska [abs.]: American Association of Petroleum Geologists Abstacts with Programs, p. 667. **** Discrimination of three different types of detachments involved in thrusting in the north central Brooks Range and Arctic coastal plain.

(T,r) Kelley, J. S., Nelson, W. H., and Bohn, Diedra, 1984, Range-front thrust faults and folds, north-central Arctic Alaska [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 292. **** Northward thrusting forms duplexes; northward verging anticlines are fault-bend folds formed by beds riding over ramps. Later folds have axes perpendicular to the direction of thrust transport.

(A,E,M) Kelsey, G. L., 1979, Petrology of metamorphic rocks hosting volcanogenic massive sulfide deposits, Ambler District, Alaska: unpublished M.S. thesis, Arizona State University, 156 p. **** Describes geologic setting of eastern half of the Ambler District including igneous and metamorphic petrology (Ambler River and Survey Pass quadrangles).

(I) Kelsey, G. L., Glavinovich, P. S., and Sheridan, M. F., 1980, High-K meta-rhyolites associated with volcanogenic sulfides, Ambler District, northwestern Alaska [abs.]: Geological Society of America Abstracts with Programs, v. 12, p. 114. **** Suggests an extensional tectonic setting for Devonian volcanism in the Ambler River and Survey Pass quadrangles.

(S,u) Kopf, R. W., 1970, Geologic names in use north of the Brooks Range, Alaska, <u>in</u> Adkinson, W. L., and Brosgé, M. M., eds., Proceedings of the geological seminar on the North Slope of Alaska: American Association of Petroleum Geologists, Pacific Section, Los Angeles, California, p. Q1-Q5. **** Lists unit names and literature sources for rocks in northern Alaska.

(E) Koschmann, A. H., and Bergendahl, M. H., 1968, Principal gold producing districts of the United States: U.S. Geological Survey Professional Paper 610, p. 16. **** Brief mention of placer deposits in the Baird Mountains area.

(S,T,a,u) Leffingwell, E. de K., 1919, The Canning River region, northern Alaska: U.S. Geological Survey Professional Paper 109, 251 p. **** Structure and stratigrapy of Lisburne Group carbonates, with a detailed list of fossils and locality descriptions (p. 100-128).

(E) Lund, R. J., 1961, Future of Alaskan mineral industry: Mining Engineering, v. 13, 12 p. 1351-1355. **** Reports reserves of the Ruby Creek copper deposit, Ambler River quadrangle.

(S,b,a) Mamet, B. L., and Tailleur, I. L., 1984, Late Paleozoic endothyrid biostratigraphy, western Brooks Range, Alaska [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 319. **** Endothyrid zonation previously unreported in North America in Baird Group in De Long and Baird Mountains. New zones straddle Devonian-Carboniferous boundary and resemble the microfauna described from the Omolon massif in northeastern Siberia.

(S) Marrs, D. C., 1983, Geologic map of the Ambler District, southwestern Brooks Range, Alaska [abs.]: Alaska Geological Society Symposium, New developments in Paleozoic geology of Alaska and the Yukon, Program and Abstracts, Anchorage, Alaska, p. 19-20. **** Interprets Ambler sequence as submarine volcanic rocks interbedded with pelitic metasedimentary rocks.

(T) Martin, A. J., 1970, Structure and tectonic history of the western Brooks Range, De Long Mountains and Lisburne Hills, northern Alaska: Geologic Society of America Bulletin, v. 81, no. 12, p. 3605-3621. **** Jurassic through late Cretaceous thrusting in the western Brooks Range, accompanied by gravity sliding in subsiding flysch troughs in the De Long Mountains, resulted in transportation of sheets of a single stratigraphic sequence for at least 100 km.

(E) Martin, G. C., 1919, The Alaskan mining industry in 1917: U.S. Geological Survey Bulletin 692-A, p. 42. **** Brief mention of placer gold activity in the Baird Mountains region.

(E,a) Matzo, J. J., and Freeman, V. L., 1963, Summary reconnaissance for uranium in Alaska, 1955: U.S. Geological Survey Bulletin 1155, p. 33-49. **** The schist of the Kallarichuk Hills has a stronger radioactive signature than the Cretaceous coal-bearing conglomerate on the banks of the Kobuk River.

(M,b) Mayfield, C. F., 1976, Metamorphism in the southwestern Brooks Range, <u>in</u> Cobb, E. H., ed., The United States Geological Survey in Alaska--Accomplishments during 1975: U.S. Geological Survey Circular 733, p. 31-32. **** Describes metamorphic mineral assemblages in "schist belt" in Baird Mountains and Ambler River quadrangles, including the occurrence of retrograded glaucophane and polymetamorphic fabrics.

(E,r) Mayfield, C. F., Curtis, S. M., Ellersieck, Inyo, and Tailleur, I. L., 1979, Reconnaissance geology of the Ginny Creek zinc-lead-silver and Nimiuktuk barite deposits, northwesten Brooks Range, Alaska: U.S. Geological Survey Open-File Report 79-1092, 20 p., 2 sheets, scale 1:63,360. **** Description, location, regional setting and interpretation of Ginny Creek and Nimiuktuk deposits. Includes maps and geochemical data for stream, soil, and rock samples.

(A,r) Mayfield, C. F., Curtis, S. M., Ellersieck, I. F., and Tailleur, I. L., 1982, Reconnaissance geologic map of the southeastern part of the Misheguk Mountain quadrangle, Alaska: U.S. Geological Survey Open-File Report 82-613, scale 1:63,360. **** Map, fossil tables, brief unit descriptions and general geologic history in terms of seven thrust sequences, also referred to as the allochthon model.

(A,r) Mayfield, C. F., Curtis, S. M., Ellersieck, I. F., and Tailleur, I. L., 1983, Reconnaissance geologic map of the De Long Mountains A3, B3, and parts of A4, B4 quadrangles, Alaska: U.S. Geological Survey Open-File Report 83-183. 59 p., scale 1:63,360.

(M,a,b) Mayfield, C. F., Silberman, M. L., and Tailleur, I. L., 1982, Precambrian metamorphic rocks from the Hub Mountain terrane, Baird Mountains, Alaska, in Coonrad, W. L., ed., The United States Geological Survey in Alaska--Accomplishments during 1980: U.S. Geological Survey Circular 844, p. 18-22. **** The Hub Mountain terrane, in the northwestern Baird Mountains quadrangle, is identified by metasedimentary, metavolcanic, and metaplutonic rocks that were metamorphosed both in late Precambrian and Cretaceous times. Three new K/Ar ages from quartz mica schist, metabasite, and metadiorite yield latest Precambrian to Cambrian ages.

(A,a) Mayfield, C. F., Tailleur, I. L., Albert, N. R. D., Ellersieck, Inyo, Grybeck, Donald, and Hackett, S. W., 1983, The Alaskan Mineral Resource Assessment Program--Background information to accompany folio of geologic and mineral resource maps of the Ambler River quadrangle, Alaska: U.S. Geological Survey Circular 793, 31 p. **** General overview of the Ambler quadrangle AMRAP project, including a history of work done in the area. Includes tables of isotopic and fossil ages and a brief description of each map in the map folio.

(S,T) Mayfield, C. F., Tailleur, I. L., Ellersieck, Inyo, 1983, Stratigraphy, structure, and palinspastic synthesis of the western Brooks Range, northwestern Alaska: U.S. Geological Survey Open-File Report 83-779, 53 p. **** Interpretive synthesis of western Brooks Range geology; explanation of the seven allochthon model. Includes generalized stratigraphic sections for each allochthon, an allochthon map, and a palinspastic reconstruction of allochthons.

(S,a) Mayfield, C. F., Tailleur, I. L., Mull, C. G., and Silberman, M. L., 1978, Granitic clasts from the Upper Cretaceous conglomerate in the northwestern Brooks Range, in Johnson, K. M., ed., The United States Geological Survey in Alaska--Accomplishments during 1977: U.S. Geological Survey Circular 722-B, p. B11-B13. **** Two quartz diorite clasts from Cretaceous conglomerate (Buchia ages) yield Jurassic K/Ar ages.

(E) Mayfield, C. F., and Grybeck, Donald, 1978, Mineral occurrences and resources of the Ambler River quadrangle, Alaska: U.S. Geological Survey Open-File Report 78-120I, 3 sheets, scale 1:250,000.

(A,r) Mayfield, C. F., and Tailleur, I. L., 1978, Bedrock geology map of the Ambler River quadrangle, Alaska: U.S. Geological Survey Open-File Report 120A, scale 1;250,000. **** Based on Pessel and Brosgé, 1977, with revised stratigraphy.

(T) McWhae, J. R. H., 1985, Late tectonic history of Beafort Sea-north Pacific area [abs.]: American Association of Petroleum Geologists Bulletin, v. 69, no. 2, p. 287. **** Model for development and extension of the Kaltag Fault from the Alaskan border to Greenland.

(H) Mendenhall, W. C., 1902, Reconnaissance from Fort Hamlin to Kotzebue Sound, Alaska, by way of Dall, Kanuti, Allen, and Kowak Rivers: U.S. Geological Survey Professional Paper 10, p. 31-35. **** Lithologic descriptions of rocks along the Kobuk and Squirrel Rivers; reference to various early workers in the area, including topographic surveys by Reaburn, from the 1901 field season.

(E) Metz, P. A., Robinson, M. S., Pease, J. L., and Lueck, Larry, 1982, Landsat linear features and incipient rift system model for the origin of base metal and petroleum resources of northern Alaska, in Embry, A. F., and Balkwill, H. R., eds., Arctic geology and geophysics: Canadian Society of Petroleum Geologists, Memoir 8, p. 101-112. **** Broad regional correlations of geology and mineral occurrences based on limited regional data and local study of linears in Galbraith Lake and Romanzoff Mountain areas.

(E) Moffit, F. H., 1927, Mineral industry of Alaska in 1925: U.S. Geological Survey Bulletin 792, p. 23. **** Brief description of mining activity.

(S) Moore, T. E., and Nilsen, T. H., 1984, Regional variations in the fluvial Upper Devonian and Lower Mississippian(?) Kanayut Conglomerate, Brooks Range, Alaska: Sedimentary Geology, v. 38, p. 465-497. **** Comparison of stratigraphic and sedimentologic data of three sections of Kanayut Colglomerate from the western, central, and eastern Brooks Range. Interprets depositional environment as fluvial-deltaic, with southwest flowing streams from a mountainous source terrane to the north and east.

(S,u) Moore, T. E., Nilsen, T. H., Grantz, Arthur, and Tailleur, I. L., 1984, Parautochthonous Mississipian marine and nonmarine strata, Lisburne Peninsula, Alaska: U.S. Geological Survey Circular 939, p. 17-21. **** Introduction, description and sedimentology of the Kapaloak sequence (informal name), a western facies of the Endicott Group. These rocks consist of intercalated marine and nonmarine sandstone, shale, and coal, of Mississippian age.

(T,r) Mull, C. G., 1977, Apparent south vergent folding and possible nappes in Schwatka Mountains, in Blean, K. M., ed., The United States Geological Survey in Alaska--Accomplishments during 1976: U.S. Geological Survey Circular 751-B, p. B29-B31. ****

Interpretation of reversal and subduction direction to produce south vergent folds in Skajit Limestone and similar south vergent asymmetry of granitic bodies in the Schwatka Mountains.

(S,T) Mull, C. G., 1979, Nanushuk Group deposition and the Late Mesozoic structural evolution of the central and western Brooks Range and Arctic Slope, in Ahlbrandt, T. S., ed., Preliminary geologic, petrologic, and paleontologic results of the Nanushuk Group rocks, North Slope, Alaska: U.S. Geological Survey Circular 794, p. 5-13. **** Discrimination of various allochthons as identifiable source terranes for Cretaceous Nanushuk sedimentation. Analysis of deposition and deformation of Nanushuk Group.

(T,r) Mull, C. G., 1980, Evolution of Brooks Range thrust belt and Arctic slope, Alaska [abs.]: American Association of Petroleum Geologists Bulletin, v. 64, no. 5, p. 754-755. **** Model for rift-generation of the Arctic Ocean and discussion of the Arctic Alaska plate.

(T,r) Mull, C. G., 1982, The tectonic evolution and structural style of the Brooks Range, Alaska--An illustrated summary, in Powers, R. B., ed., Geologic studies of the Cordilleran thrust belt: Rocky Mountain Association of Geologists, v. 1, p. 1-45. **** Regional overview of Brooks Range tectonics. Complements western Brooks Range allochthon model (Mayfield and others, 1983) with northern Brooks Range autochthon-allochthon model. Many 8x10 photographs of large scale structures.

(T) Mull, C. G., 1983, Structural evolution of the Brooks Range and Arctic Slope, Alaska: Geologic Association of Canada Program with Abstracts, v. 8, p. A49. **** Model for counter-clockwise rotation of Arctic Alaska plate.

(T) Mull, C. G., 1984, New interpretations on timing and origin of the Arctic Alaska block [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 323. **** Hypothesis that Brooks Range orogeny was initiated by convergence of Pacific and North American plates. Major crustal shortening in the Brooks Range took place during Berriasian and Valanginian time. Sea floor spreading in the Canada Basin began in Hauterivian time.

(S,a,u) Mull, C. G., Tailleur, I. L., Mayfield, C. F., Ellersieck, Inyo, and Curtis, S. M., 1982, New upper Paleozoic and lower Mesozoic stratigraphic units, central and western Brooks Range, Alaska: American Association of Petroleum Geologists Bulletin, v. 66, no. 3, p. 348-362. **** Designation of type localities and reference sections for a new stratigraphic unit, the Kuna Formation, and also for the Etivluk Group, the Otuk Formation, and the Blankenship member of the Otuk Formation. Includes measured sections, detailed unit descriptions and age information.

(S) Mull, C. G., and Tailleur, I. L., 1977, Sadlerochit(?) Group in the Schwatka Mountains, south-central Brooks Range, _in_ Blean, K. M., ed., The United States Geological Survey in Alaska--Accomplishments during 1976: U.S. Geological Survey Circular 751-B, p. B27-B29. **** Kekiktuk-Kayak-Lisburne-Sadlerochit sequence considered to be autochthonous, and to have a different source terrane (from the north) than the allochthonous Hunt Fork-Noatak-Kanayut sequence.

(S,T) Mull, C. G., Tailleur, I. L., Mayfield, C. F., and Pessel, G. H., 1976, New structural and stratigraphic interpretations, central and western Brooks Range and Arctic Slope, _in_ Cobb, E. H., ed., The United Geological Survey in Alaska--Accomplishments during 1975: U.S. Geological Survey Circular 733, p. 24-26. **** Discusses a Cretaceous olistostrome, the Nuka Formation, and the Endicott allochthon.

(S,a) Murchey, B. L., Swain, P. B., and Curtis, Steven, 1981, Late Mississippian to Pennsylvanian radiolarian assemblages in the Siksikpuk(?) Formation at Nigu Bluff, Howard Pass quadrangle, Alaska, _in_ Albert, N. R. D., and Hudson, Travis, eds., The United States Geological Survey in Alaska--Accomplishments during 1979: U.S. Geological Survey Circular 823-B, p. B17-B19. **** Description and measured section of Siksikpuk(?) Formation.

(A,M) Nelsen, C. J., 1979, The geology and blueschist petrology of the western Ambler schist belt, Southwestern Brooks Range, Alaska: unpublished M.S. thesis, University of New Mexico, 123 p.

(T,M,r) Nelson, S. W., and Grybeck, Donald, 1979, Tectonic significance of metamorphic grade distribution, Survey Pass quadrangle, Alaska, _in_ Johnson, K. M., and Williams, J. R., eds., The United States Geological Survey in Alaska--Accomplishments during 1978: U.S. Geological Survey Circular 804-B, p. B16-B18. **** Petrography of three different metamorphic rock units having different grades, and separated by thrust faults.

(A,r) Nelson, S. W., and Grybeck, Donald, 1980, Geologic map of the Survey Pass quadrangle, Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF 1176-A, scale 1:250,000.

(T,r) Newman, G. W., Mull, C. G., and Watkins, N. D., 1979, Northern Alaska paleomagnetism, plate rotation, and tectonics, _in_ Sisson, A., ed., The relationship of plate tectonics to Alaskan geology and resources: Proceedings of Alaska Geological Society Symposium, p. C1-C7. **** Paleomagnetic data support rotational opening of the Canada Basin.

(S,r) Nilsen, T. H., 1981, Upper Devonian and Lower Mississippian redbeds, Brooks Range, Alaska, _in_ Miall, A. D., ed., Sedimentation and tectonics in alluvial basins: Geological Association of Canada Special Paper 23, p. 187-219. **** Redbeds refer to extensive deposits of nonmarine rock, not necessarily red in color. The rocks described and interpreted are the

relatively allocthanous Kanayut Conglomerate and the relatively autocthanous Kekiktuk Conglomerate, both thought to be parts of one southwestward prograding fluvio-deltaic system. Preferred hypothesis involves post-Mississippian translation from a source terrane in eastern Greenland.

(T,r) Nilsen, T. H., 1984, Tectonic reconstruction of Devonian redbeds of the Brooks Range, Alaska [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 326. **** Devonian and Lower Mississippian non-marine deposits of the Brooks Range resemble those of the Caledonian orogen rather than the Cordilleran orogen. Preferred model involves sinistral slip from a position directly north of the north Greenland fold belt.

(S) Nilsen, T. H., Brosgé, W. P., Duto, J. T., and Moore, T. E., 1980, The Kanayut Conglomerate--A major Upper Devonian delta complex, Brooks Range, northern Alaska: Geological Society of America Abstracts with Programs, v. 12, no. 7, p. 492. **** Paleocurrents, facies interpretation, and global context of the Kanayut Conglomerate.

(T,S) Nilsen, T. H., Brosgé, W. P., Moore, T. E., Dutro, J. T., and Balin, D. F., 1982, Significance of the Endicott Group for tectonic models of the Brooks Range, in Coonrad, W. L., ed., The United States Geological Survey in Alaska--Accomplishments during 1980: U.S. Geological Survey Circular 844, p. 28-31. **** Brief comparison of several tectonic models with respect to the reconstruction of the Paleozoic depositional environment of the Endicott Group.

(S,u) Nilsen, T. H., and Moore, T. E., 1984, Stratigraphic nomenclature for the Upper Devonian and Lower Mississippian(?) Kanayut Conglomerate, Brooks Range, Alaska: U.S. Geological Survey Bulletin 1529A, 64 p. **** Kanayut Conglomerate redefined to include 3 fluvial units: The Ear Peak Member overlain by the Shainin Lake Member, in turn overlain by the Stuver Member. The basal marine sandstone is assigned to the Noatak Sandstone.

(S) Nilsen, T. H., and Moore, T. E., 1984, The Kanayut Conglomerate in the westernmost Brooks Range, Alaska, in Coonrad, W. L., and Elliot, R. L., eds., The United States Geological Survey in Alaska--Accomplishments during 1981: U.S. Geological Survey Circular 868, p. 12-15. **** Distribution of the Endicott Group and Paleocurrent data in the central and eastern Brooks Range with measured sections.

(T,S) Nilsen, T. H., and Moore, T. E., 1985, Tectonic significance of Kanayut Colglomerate and related middle Paleozoic deposits, Brooks Range, Alaska: American Association of Petroleum Geologists Bulletin, vol. 69, no. 4, p. 673. **** Kanayut Conglomerate may have been displaced from a position contiguous with the Old Red Sandstone in Svalbard and East Greenland. Translation was post-Mississippian and may have begun prior to the late Mesozoic opening of the Canada basin.

(S) Nilsen, T. H., Moore, T. E., and Brosgé, W. P., 1980, Paleocurrent maps for the the Upper Devonian and Lower Mississippian Endicott Group, Brooks Range, Alaska: U.S. Geological Survey Open-File Report 80-1066, scale 1:1,000,000.

(S) Nilsen, T. H., Moore, T. E., Dutro, J. T., Jr., Brosgé, W. P., and Orchard, D. M., 1980, Sedimentology and stratigraphy of the Kanayuk Conglomerate and associated units, central and eastern Brooks Range, Alaska--Report of the 1978 field season: U.S. Geological Survey Open-File Report 80-888, 40 p. **** Detailed sedimentology and petrography of Endicott Group rocks from the central Brooks Range. Interpretation of source terrane and depositional environments provides constraints for various enigmatic tectonic models.

(E) Nokleberg, W. J., 1979, Volcanogenic zinc-lead-barite deposits in pelagic rocks of late Paleozoic and early Mesozoic age, northwestern Brooks Range, Alaska [abs.]: Geological Association of Canada Abstracts with Programs, v. 4, p. 21. **** Discussion of the similarities of Red Dog and Drenchwater Creek deposits. Interpretation of volcanogenic origin for both deposits.

(E) Nokleberg, W. J., Plahuta, J. T., Lange, I. M., and Grybeck, Donald, 1979, Volcanogenic zinc-lead mineralization in pelagic sedimentary rocks of late Paleozoic age, northwestern Brooks Range, Alaska [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 7, p. 487-488. **** Red Dog and Drenchwater deposits, in chert, shale, tuff, and volcanic rocks of the Kagvik sequence, are interpreted to have formed in a Kuroko-type environment.

(E,a) Nokleberg, W. J., and Winkler, G. R., 1978a, Geologic setting of stratiform zinc-lead mineralization, Drenchwater Creek area, Howard Pass quadrangle, western Brooks Range, Alaska: Geological Society of America Abstracts with Program, v. 10, no. 3, p. 139. **** 319 m.y. K/Ar date on biotite from felsic volcanic rocks at Drenchwater Creek. Mineralization interpreted to have its source as volcanic exhalatives, and was remobilized by later tectonism.

(E,r) Nokleberg, W. J., and Winkler, G. R., 1978b, Stratiform zinc-lead mineralization, Drenchwater Creek area, Howard Pass qudrangle, western Brooks Range, Alaska, in Johnson, K. M., ed., U.S. Geological Survey in Alaska--Accomplishments during 1977: U.S. Geological Survey Circular 772-B, p. 17-19. **** Pb-Zn deposit in Mississippian tuff, shale and chert interpreted as a tectonic block in coarse regional tectonic breccia. Drenchwater Creek deposit is compared to the Red Dog deposit, which is in a similar stratigraphic horizon.

(E,r) Nokleberg, W. J., and Winkler, G. R., 1982, Stratiform zinc-lead deposits in the Drenchwater Creek area, Howard Pass quadrangle, northwestern Brooks Range, Alaska: U.S. Geological Survey

Professional Paper 1209, 22 p., 2 plates, scale 1:19,800. **** Map and detailed description of Drenchwater Creek deposit, including petrographic, chemical and isotopic analyses.

(T,r) Oldow, J. S., Avé Lallemant, H. G., Julian, F. E., Seidensticker, C. M., and Phelps, J. C., 1984, The Doonerak window duplex--Regional implications [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 326. **** Evidence for thrust contact rather than an unconformity between upper and lower Paleozoic rocks at Doonerak.

(S,a) Oliver, W. A., Jr., Merriam, C. W., and Churkin, Michael, Jr., 1975, Ordovician, Silurian, and Devonian corals of Alaska: U.S. Geological Survey Professional Paper 823-B, p. 13-44. **** Includes plates of corals from Baird Group, and the Skajit, Eli , and Kugururok Formations.

(T,S,r,a) Palmer, A. R., Dillon, John, and Dutro, J. T., Jr., 1984, Middle Cambrian trilobites with Siberian affinities from the central Brooks Range, northern Alaska [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 327. **** Middle Cambrian trilobites from Mount Doonerak and Snowden Mountain have affinities with Siberian platform shelf facies fauna, and do not resemble Cordilleran faunas.

(S,u) Patton, W. W., Jr., 1956, New and redefined formations of Early Cretaceous age, in Gryc, George, and others, eds., Mesozoic sequence in Colville River region, northern Alaska: American Association of Petroleum Geologists Bulletin, v. 40, no. 2, p. 209-254. **** The Torok Formation, overlying the Okpikruak Formation, is subdivided such that the southern clastic facies is named the Fortress Mountain Formation.

(S,u) Patton, W. W., Jr., 1956, New Formation of Jurassic Age, in Gryc, George, and others, eds., Mesozoic sequence in the Colville River region, northern Alaska: American Association of Petroleum Geologists Bulletin, v. 40, no. 2, p. 209-254. **** Naming of Tiglukpuk Formation. Later abandoned due to new fossil ages (Jones and Grantz, 1964).

(S,u) Patton, W. W., Jr., 1957, A new upper Paleozoic formation, central Brooks Range, Alaska: U.S. Geological Survey Professional Paper 303-B, part 3, p. 41-45. **** Naming paper and type locality for the Siksikpuk Formation.

(A,r) Patton, W. W., Jr., 1973, Reconnaissance geology of the northern Yukon-Koyukuk province, Alaska: U.S. Geological Survey Professional Paper 744-A, p. A1-A17.

(E,r) Patton, W. W., Jr., and Matzko, J. J., 1959, Phosphate deposits in northern Alaska: U.S. Geological Survey Professional Paper 302-A, 17 p. **** Phosphatic rocks occur in the Mississippian Lisburne Group and the Triassic Shublik Formation, along the northern front of the Brooks Range and adjoining foothills.

(A,r) Patton, W. W., Jr., and Miller, T. P., 1966, Regional geology of the Hughes quadrangle, Alaska: U.S. Geological Survey Miscellaneous Investigations Map I-439, scale 1:250,000. **** Map covers an area of Angayuchum basalts, which may be correlative with basalts in the extreme SE and NW corners of the Baird Mountains quadrangle.

(A,a,b) Patton, W. W., Jr., and Miller, T. P., 1968, Regional geologic map of the Selawik and southeastern Baird Mountains quadrangles, Alaska: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-530, 1 sheet, scale 1:250,000. **** Distribution of upper Mesozoic rocks and a K/Ar biotite age of 85 m.y. for a tuff on the Kobuk River.

(A,r) Patton, W. W., Jr., Miller, T. P., and Tailleur, I. L., 1968, Regional geology of the Shungnak and southern part of the Ambler River quadrangle, Alaska: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-544, scale 1:250,000.

(A,S) Patton, W. W., Jr., and Tailleur, I. L., 1964, Geology of the Killik-Itkillik region, Alaska: U.S. Geological Survey Professional Paper 303-G, p. 409-500. **** Measured sections from rock units in the central Brooks Range, including Lisburne Group, Siksikpuk Formation, Tiglukpuk Formation, and Okpikruak Formation.

(T,r) Patton, W. W., Jr., and Tailleur, I. L., 1977, Evidence in the Bering Strait region for differential movement between North America and Eurasia: Geological Society of America Bulletin, v. 88, no. 9, p. 1298-1304. **** Oroclinal bending hypothesis based on lithologic distributions in the Brooks Range, and on the Seward and Chukotsk Peninsulas.

(I,T,r) Patton, W. W., Jr., Tailleur, I. L., Brosgé, W. P., and Lanphere, M. A., 1977, Preliminary report on the ophiolites of northern and western Alaska, in Coleman, R. G., and Irwin, W. P., eds., North American ophiolites: Oregon Department of Geology and Mineral Industries Bulletin 95, p. 51-57. **** Includes mention of ophiolite occurrences in the western Brooks Range.

(T) Payne, T. G., 1955, Mesozoic and Cenozoic tectonic elements of Alaska: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-84.

(E,b) Pessel, G. H., 1976, Geochemistry of stream sediment samples in southeastern Baird Mountains quadrangle, Alaska: Alaska Division of Geological and Geophysical Surveys Open-File Report AOF-88, 8 sheets.

(Q,A) Pessel, G. H., 1977, Probable karst topography near Jade Mountains, southwestern Brooks Range, Alaska: Alaska Division of Geological and Geophysical Surveys Geologic Report 55, Short Notes on

Alaskan Geology 1977, p. 3-5. **** Describes paleo-karst features in Devonian(?) carbonate rocks.

(A,r) Pessel, G. H., and Brosgé, W. P., 1977, Preliminary reconnaissance geologic map of Ambler River quadrangle: U.S. Geological Survey Open-File Report 77-28, scale 1:250,000. **** Geologic map of the quadrangle bordering the Baird Mountains quadrangle on the east, shows schist belt units extending into the Baird Mountains quadrangle.

(Q,r) Péwé, T. L., 1975, Quaternary geology of Alaska: U.S. Geological Survey Professional Paper 835, 145 p. **** Organized by deposit type, statewide.

(S,a) Plafker, George, Hudson, Travis, and Jones, D. L., 1978, Upper Triassic radiolarian chert from the Kobuk volcanic sequence in the southern Brooks Range, in Johnson, K. M., ed., The United States Geological Survey in Alaska--Accomplishments during 1977: U.S. Geological Survey Circular 722-B, p. B45-B47. **** Radiolarian ribbon cherts intercalated with pillow basalts which were previously considered to be Jurassic, and subsequently thought be late Paleozoic in age, yielded Late Triassic radiolarians. These rocks were included in the Yukon-Koyukuk ophiolite belt, later to become the Angayuchum terrane.

(E) Plahuta, J. T., 1978, Geologic map and cross-sections of the Red Dog prospect, De Long Mountains, northwestern Alaska: U.S. Bureau of Mines Open-File Report 65-78, p. 11. **** Outcrop map and location of sulfide occurrences.

(E) Plahuta, J. T., Lange, I. M., and Jansons, Uldis, 1978, The nature of mineralization at the Red Dog prospect, western Brooks Range, Alaska, [abs]: Geological Society of America Abstracts with Programs, Cordilleran Section, 74th Annual Meeting, Tempe, Arizona, March 29-31, p. 142. **** Syngenetic stratiform mineralization and vein and breccia filling in an upper Paleozoic chert and shale unit.

(Q,r) Porter, S. C., Pierce, K. L., and Hamilton, T. D., 1983, Late Wisconsin mountain glaciation in the western United States: in Wright, H. E., Jr., and Porter, S. C., eds., Late Quaternary environments of the United States, volume 1, The late Pleistocene: University of Minnesota Press, Minneapolis, p. 71-111. **** Includes map showing extent of late Wisconsin glaciation in the western Brooks Range.

(E,b) Reed, Irving, 1932, Report on the placer deposits of the Squirrel River gold field: Territory of Alaska Department of Mines MR 27-1, p 32.

(T,r) Roeder, Dietrich, and Mull, C. G., 1978, Tectonics of Brooks Range ophiolites, Alaska: American Association of Petroleum Geologists

Bulletin, v. 62, no. 9, p. 1696-1702. **** General description of Brooks Range ophiolites and proposed models of tectonic emplacement.

(T) Rowley, D. B., Lottes, A. L., and Zeigler, A. M., 1985, North America-Greenland-Eurasian relative plate motions--Implications for circum-Arctic tectonic reconstructions [abs.]: American Association of Petroleum Geologists Bulletin, v. 69, no. 2, p. 303. **** Interpretation that (1) North America and Eurasia were fixed relative to each other until latest Cretaceous time, (2) North Slope-Seward-Chuktoka block constituted an isthmus between North America and Asia since Paleozoic time, (3) Canada Basin opened behind clockwise rotation of the Alph-Cordillera-Mendeleyev ridge arc during early to middle Cretaceous, and (4) 250 km of transpressive motion took place between northern Ellesmere Island and Greenland.

(S,E,r) Rubin, C. M., 1984, Geologic setting and sulfide mineralization of the Smucker deposit, southcentral Brooks Range, Alaska [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 6, p. 640. **** Describes structure, mineralogy, and mineralization. Interprets tectonic setting of mineralization of Smucker deposit in Ambler Group schists as late Devonian epicratonic rift margin or back-arc basin.

(E) Runnels, D. D., 1963, The copper deposits of Ruby Creek, Cosmos Hills, Alaska: unpublished Ph.D. dissertation, Harvard University, 275 p. **** Minerology, description and sulfer isotopic interpretation of a large carbonate-hosted deposit just east of the Baird Mountains.

(E,M) Runnels, D. D., 1964, Cymrite on a copper deposit, Brooks Range, Alaska: American Minerologist, v. 49, p. 158-165. **** Identification of a rare Ba-silicate phase found in high pressure metamorphic terranes and low temperature sulfide deposits.

(E) Runnels, D. D., 1969, The mineralogy and sulfur isotopes of the Ruby Creek copper prospect, Bornite, Alaska: Economic Geology, v. 64, p. 75-90. **** Summarizes work of 1963 Ph.D. dissertation on the Ruby Creek prospect.

(S,u,a) Sable, E. G., and Dutro, J. T., Jr., 1961, New Devonian and Mississippian formations in De Long Mountains, northern Alaska: American Association of Petroleum Geologists Bulletin, v. 45, no. 5, p. 585-593. **** Naming paper for Kuguroruk, Kogruk, Utukok and Tupik Formations. Division of Lisburne Group into Utukok, Kogruk and Tupik units in the western Brooks Range. Includes measured sections.

(E,I) Schmidt, J. M., 1981, Volcanogenic massive sulfide deposition in a rifted continental margin--The Arctic deposit, southwestern Brooks Range Alaska [abs.]: Geological Society of America

Abstracts with Programs, v. 13, no. 7, p. 54 **** Uses the composition of Devonian to Mississippian meta-igneous rocks to interpret the tectonic setting in which these rocks formed.

(E,M) Schmidt, J. M., 1982, Arctic Camp, Alaska--A metamorphosed volcanic massive sulfide deposit [abs.]: Geological Association of Canada Program with Abstracts, v. 7, p. 80. **** Interprets the Arctic prospect (Ambler River quadrangle) as a felsic volcanogenic massive sulfide deposit overprinted by low greenschist facies metamorphism.

(E) Schmidt, J. M., 1983a, Geology and Geochemistry of the Arctic prospect, Ambler District, Alaska: unpublished Ph.D. dissertation, Stanford University, California, 253 p. **** Summarizes the geologic setting, stratigraphy, alteration and chemistry of the Arctic prospect from drill core data.

(E,I) Schmidt, J. M., 1983b, Primary igneous and alteration features of the Arctic prospect, Ambler District, Alaska: AIME-Society of Economic Geologists Winter Meeting Program, Atlanta, Georgia, [abs.] p. 76. **** Pre-metamorphic features of a large Cu deposit in the Ambler River quadrangle.

(T) Schmidt, J. M., 1984, Basalt-rhyolite volcanism of the late Devonian Ambler sequence, northern Alaska--Major element compositions and tectonic setting [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 331. **** Subaqueous rhyolites and low-K tholeitic basalts, probably formed in extensional environment.

(S,u) Schrader, F. C., 1902, Geologic section of the Rocky Mountains in northern Alaska: Geological Society of America Bulletin, v. 13, p. 233-252. **** Cross section of the Brooks Range near Koyukuk, John, Anaktuvik, and Colville Rivers. Naming paper for Skajit Formation, Totsen Series, Fickett Series, Stuver Series, Lisburne Limestone, Corwin Series, Anaktuvik Series, Koyukuk Series, Bergman Series, Nanushuk Series, and Colville Series.

(S,a) Schrader, F. C., 1904, A reconnaissance in northern Alaska: U.S. Geological Survey Professional Paper 20, 139 p. Results of the 1901 field season, including a description of the Paleozoic Skajit, Totsen, Stuver, Lisburne, and Fickett series, the Mesozoic Corwin, Anaktuvuk, Koyukuk, Bergman, and Nanushuk,series, the Cenozoic Colville series, and Pleistocene deposits. Also includes fossil age determinations, a correlation chart, and a summary of mineral resources.

(E) Sickermann, H. A., Russell, R. H., and Fikkan, P. R., 1976, The geology and mineralization of the Ambler District, Alaska: Northwest Mining Association Meeting, Spokane, Washington, 22 p. **** Describes the general geology of the Ambler District and the Ruby Creek and Arctic deposits (Ambler River and Survey Pass quadrangles).

(G,a) Silberman, M. L., Brookins, D. G., Nelson, S. W., and Grybeck, Donald, 1979, Rubidium-strontium and potassium-argon dating of emplacement and metamorphism of the Arrigetch Peaks and Mount Igikpak plutons, Survey Pass quadrangle, Alaska, in Johnson, K. M., and Williams, J. R., eds., The United States Geological Survey in Alaska--Accomplishments during 1978: U.S. Geological Survey Circular 804-B, p. B18-B19. **** Rb/Sr isochron yields an age of 375±25 m.y. (Devonian) for the Arrigetch and Igikpak plutons. High initial Sr^{87}/Sr^{86} ratio suggests mobilization of older crust.

(S,a) Siok, J. P., 1984, A siliceous facies of the Siksikpuk formation, north central Brooks Range, Alaska [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 333. **** Siksikpuk formation interpreted to represent shelf facies with Permian fauna at type locality, and more basinal facies with Early Pennsylvanian fauna in higher thrust sequences.

(S,a) Siok, J. P., 1985, Phosphatic glauconitic sandstone and oncolite deposition at the upper Paleozoic base of the Etivluk Group, north central Brooks Range, Alaska: American Association of Petroleum Geologists Program and Abstracts, p. 35-36. **** Early Pennsylvanian (Morrowan) radiolarian age for bedded Siksikpuk cherts overlying phosphatic and glauconitic sandstone; interpreted to represent a shelf environment.

(E,b) Smith, P. S., 1911, The Squirrel River placers: U.S. Geological Survey Bulletin 480, p. 306-319. **** Description of geology and placer operations on Klery Creek and tributaries to the Squirrel River. Comparison of bedrock and mineralization to Solomon, Casadepapga, Bendeleben-Kigluaik, and southern Kougarok Districts on the Seward Peninsula.

(E,r) Smith, P. S., 1912, The Alatna-Noatak region: U.S. Geological Survey Bulletin 520, p. 315-338. **** The schists from the headwaters of the Alatna and Noatak Rivers are thought to be equivalents of the Nome Group of the Seward Peninsula by both Smith and Mendenhall. The schists are considered to be early Paleozoic or older. Carbonates are thought to correspond to both Schrader's Skajit Formation and the Silurian dolomite horizon on the Seward Peninsula.

(E,A,r,u) Smith, P. S., 1913, The Noatak-Kobuk region, Alaska: U.S. Geological Survey Bulletin 536, p. 133-168. **** Naming paper for Noatak Sandstone. Description of geology of the region and reiteration of placer report in Smith, 1911.

(E) Smith, P. S., 1926, Mineral industry of Alaska in 1924: U.S. Geological Survey Bulletin 783 p. 17. **** Brief report on the status of placer mining along Klery Creek and its tributaries.

(E) Smith, P. S., 1929, Mineral industry of Alaska in 1926: U.S. Geological Survey Bulletin 797, p. 27. **** Brief report on the status of placer mining along Klery Creek and its tributaries.

(E) Smith, P. S., 1930a, Mineral industry of Alaska in 1927: U.S. Geological Survey Bulletin 810, p. 37. **** Brief report on the status of placer mining along Klery Creek and its tributaries.

(E) Smith, P. S., 1930b, Mineral industry of Alaska in 1928: U.S. Geological Survey Bulletin 813, p. 43-44. **** Brief report on the status of placer mining along Klery Creek and its tributaries.

(E) Smith, P. S., 1932, Mineral industry of Alaska in 1929: U.S. Geological Survey Bulletin 824, P. 46-47 **** Brief report on the status of placer mining along Klery Creek and its tributaries (identical to Smith, 1930b).

(E) Smith, P. S., 1933a, Mineral industry of Alaska in 1930: U.S. Geological Survey Bulletin 836, p. 50. **** Brief report on the status of placer mining along Klery Creek and its tributaries (identical to Smith, 1930b).

(E) Smith, P. S., 1933b, Mineral industry of Alaska in 1931: U.S. Geological Survey Bulletin 844-A, p. 50-51. **** Brief report on the status of placer mining along Klery Creek and its tributaries.

(E) Smith, P. S., 1934a, Mineral industry in Alaska in 1932: U.S. Geological Survey Bulletin 857-A, p. 51. **** Brief report on the status of placer mining along Klery Creek and its tributaries.

(E) Smith, P. S., 1934b, Mineral industry of Alaska in 1933: U.S. Geological Survey Bulletin 864-A, p. 53. **** Brief report on the status of placer mining along Klery Creek and its tributaries.

(E) Smith, P. S., 1936, Mineral industry of Alaska in 1934: U.S. Geological Survey Bulletin 868-A, p. 55. **** Brief report on the status of placer mining along Klery Creek and its tributaries.

(E) Smith, P. S., 1937, Mineral industry of Alaska in 1935: U.S. Geological Survey Bulletin 880-A, p. 57-58. **** Brief report on the status of placer mining along Klery Creek and its tributaries.

(E) Smith, P. S., 1938, Mineral industry of Alaska in 1936: U.S. Geological Survey Bulletin 897-A, p. 67-68. **** Brief report on the status of placer mining along Klery Creek and its tributaries.

(R) Smith, P. S., 1939a, Areal geology of Alaska: U.S. Geological Survey Professional Paper 192, p. 17-57.

(E) Smith, P. S., 1939b, Mineral industry of Alaska in 1937: U.S. Geological Survey Bulletin 910-A, p. 71-72. **** Brief report on the status of placer mining along Klery Creek and its tributaries.

(E) Smith, P. S., 1939c, Mineral industry of Alaska in 1938: U.S. Geological Survey Bulletin 917-A, p. 70-71 **** Brief report on the status of placer mining along Klery Creek and its tributaries.

(E) Smith, P. S., 1941a, Fineness of gold from Alaska placers: U.S. Geological Survey Bulletin 910-C, p. 264.

(E) Smith, P. S., 1941b, Mineral industry of Alaska in 1939: U.S. Geological Survey Bulletin 926-A, p. 66-67. **** Brief report on the status of placer mining along Klery Creek and its tributaries.

(E) Smith, P. S., 1942, Mineral industry of Alaska in 1940: U.S. Geological Survey Bulletin 933-A, p. 63-64. **** Brief report on the status of placer mining along Klery Creek and its tributaries.

(E,S,a) Smith, P. S., and Mertie, J. B., Jr., 1930, Geology and mineral resources of northwestern Alaska: U.S. Geological Survey Bulletin 815, p. 325-331. **** Description of gold placers taken from Klery Creek and its tributaries (mostly reiteration of Smith, 1911). New fossil ages for named and unnamed rock units described by Schrader in 1902.

(H) Smith, P. S., Mertie, J. B., Jr., and Foran, W. T., 1926, Summary of recent surveys in northern Alaska: U.S. Geological Survey Bulletin 783, p. 151-168.

(E) Smith, T. E., Proffett, J. M., and Heatwole, D. A., 1979, Ambler schist belt of northwest Alaska--Host terrane for volcanogenic base metal sulfide deposits of mid-Paleozoic age [abs.]: 7th Geoscience Forum Abstracts, Whitehorse, Yukon Territory, p. 6.

(E) Smith, T. E., Proffett, J. M., Heatwole, D. A., and Seklemian, R. W., 1977, Geologic setting of base-metal massive sulfide deposits, Ambler District, northwest, Alaska [abs.]: Geological Society of America Abstracts with Programs, p. 41-42.

(E,a) Smith, T. E., Webster, G. D., Heatwole, D. A., Proffett, J. M., Kelsey, G. L., and Glavinovich, P. S., 1978, Evidence for mid-Paleozoic depositional age volcanogenic base metal massive sulfide occurrences and enclosing strata, Ambler District, northwest Alaska [abs.]: Geological Society of America Abstracts with Programs, v. 10, p. 148. **** Reports Pb-Pb ages within the range of 250-350 m.y. for galena from several deposits in the Brooks Range schist belt. Associated carbonate rocks yield Middle Devonian to Early Mississippian fossil ages.

(T) Snelson, Sigmund, and Tailleur, I. L., 1968, Large-scale thrusting and migrating Cretaceous foredeeps in the western Brooks Range and adjacent regions of northwestern Alaska [abs.]: American Association of Petroleum Geologists Bulletin, v. 52, no. 3, p. 567. **** Describes five thrust sequences derived from a major Aptian-Albian thrusting event.

(E) Stewart, B. D., 1933, Mining investigations and mine inspection in Alaska, including assistance to prospectors, biennium ending March 31, 1933: Juneau, Alaska, 192 p.

(W) Still, P. J., 1980, Index of streamflow and water-quality records to September 30, 1978, northwest Alaska: U.S. Geological Survey Open-File Report 80-553, 19 p. **** List of years in which data was collected on the Noatak, Kobuk, and Squirrel Rivers.

(T,r) Sweeney, J. F., 1982, Mid-Paleozoic travels of Arctic Alaska: Nature, v. 298, p. 647-649. **** Middle Devonian to early Mississippian orogeny accompanied by left lateral translation of Arctic Alaska from a position adjacent to northern Greenland to a position near Banks Island. Late Jurassic counterclockwise rotation of Arctic Alaska subsequently opened the Arctic Ocean basin.

(T) Sweeney, J. F., 1984, Opening of the Canada Basin, when and how [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 336. **** Counterclockwise rotational opening of Canada Basin from 135 to 79 million years ago.

(T,r) Sweeney, J. F., Irving, E., and Geuer, J. W., 1978, Evolution of the Arctic Basin, <u>in</u> Sweeney, J. F., ed., Arctic Geophysical Review: Earth Physics Branch, Department of Energy, Mines and Resources, Ottawa, Canada, v. 45, no. 4, p. 91-100.

(E) Tailleur, I. L., 1965, Low-volatile bituminous coal of Mississippian age on the Lisburne Peninsula, northwestern Alaska, <u>in</u> U.S. Geological Survey research 1965: U.S. Geological Survey Professional Paper 525-B, p. B34-B38.

(T,r) Tailleur, I. L., 1969a, Speculations on North Slope geology: Oil and Gas Journal, v. 67, no. 38, p. 215-220, 225-226. **** Generalized regional (international) geology. Shortening in the Brooks Range on large-scale thrusts in excess of 150 miles. Descrimination of tectonic rock units by characteristic rock sequences; uncertain initial stratigraphic relationships, or order of thrusting.

(T,r) Tailleur, I. L., 1969b, Rifting speculation on the geology of Alaska's North Slope: Oil and Gas Journal, v. 67, no. 39, p. 128-130 **** Rifting of Canada Basin in post-Triassic time.

(E) Tailleur, I. L., 1970, Lead-, zinc-, and barite-bearing samples from the western Brooks Range, Alaska, with a section on petrography and mineralogy by G. D. Eberlein and Ray Wehr: U.S.

Geological Survey Open-File report 445, 16 p. **** Naming of Red Dog Creek and report of significant mineral potential there and in similar rocks in the western Brooks Range.

(T) Tailleur, I. L., 1970a, Probable rift origin of Canada Basin, Arctic Ocean [abs.]: American Association of Petroleum Geologists Bulletin, v. 54, no. 12, p. 2508. **** Post-Triassic counterclockwise rotational opening of the Canada Basin.

(T) Tailleur, I. L., 1970b, Structure and stratigraphy of western Arctic Alaska [abs.]: American Association of Petroleum Geologists Bulletin, v. 54, no. 12, p. 2508. **** Early Cretaceous orogeny produced a fold and thrust belt with at least 200 km of shortening north-south, and possibly 150 km of shortening east-west. Continued deformation produced the northeast trending Chukchi syntaxis.

(I,T,b,a) Tailleur, I. L., 1973a, Possible mantle derived rocks in the western Brooks Range, Alaska, in U.S. Geological Survey research 1973: U.S. Geological Survey Professional Paper 850, p. 64-65. **** Interlayered mafic and ultramafic rocks in De Long and western Baird Mountains yield Devonian to Cretaceous K/Ar mineral ages. Discrepancy in ages not discussed.

(T) Tailleur, I. L., 1973b, Probable rift origin of the Canada Basin, Arctic Ocean: Arctic Geology Memoir No. 19, American Association of Petroleum Geologists, p. 526-535.

(T) Tailleur, I. L., 1984a, Argument for Cretaceous instead of Devonian plutonism in the Brooks Range, Northern Alaska [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 336. **** Equivocal field evidence presented in favor of Cretaceous age.

(T) Tailleur, I. L., 1984b, One presumptive paleogeography for the Phanerozoic of what is now the North American Arctic [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 336. **** Paleozoic amalgamation of De Long region with Franklinian platform, followed by Mississippian transgression. Early Cretaceous rifting and rotational opening on Arctic Ocean culminated in syntaxial bend of western portion of the orogenic foldbelt.

(T) Tailleur, I. L., and Brosgé, M. M., 1970, Tectonic history of northern Alaska, in Adkinson, W. L., and Brosgé, M. M., eds., Geological seminar on the north slope of Alaska: American Association of Petroleum Geologists, Pacific Section Proceedings, Menlo Park, California, p. E1-E19 **** Presents hypothesis of oroclinal bending for the western Brooks Range. Development of the Chukchi syntaxis is considered to be Tertiary.

(T,b,u) Tailleur, I. L., Brosgé, W. P., and Reiser, H. N., 1967, Palinspastic analysis of Devonian rocks in northwestern Alaska, in Oswald, D. H., ed., International symposium on the Devonian

System: Alberta Society of Petroleum Geologist, v. 2, p. 1345-1361. **** Naming paper for the Endicott Group, Baird Group, and Eli Limestone of the Baird Group. In this paper, Baird Group includes Skajit Limestone, Eli Limestone, and Kugururok Formation. Estimate of 100-175 km minimum displacement of thrust sheets as large as 35,000 km across.

(E,a) Tailleur, I. L., Ellersieck, I. F., Mayfield, C. F., 1977, Mineral resources of the western Brooks Range, in Blean, K. M., ed., U.S. Geological Survey Circular 751-B, p. B-24. **** Felsic igneous rocks at Drenchwater Creek give biotite K/Ar date of 319 ± 10 m.y., considered analogous to igneous rocks at Red Dog in lowest or "Brooks Range" thrust sequence of the allochthon model (Mayfield and others, 1983). Several stream sediment anomalies in western Brooks Range are noted.

(A,T) Tailleur, I. L., Kent, B. H., Jr., and Reiser, H. N., 1966, Outcrop geology maps of the Nuka-Etivluk region, northern Alaska: U.S. Geological Survey Open-File Report 66-128, 7 sheets, scale 1:63,360. **** Distinction of relatively autochthonous stratigraphic sequences, and allochthonous stratigraphic sequences with a minimum estimated 100 miles of shortening along large-scale flat thrust faults.

(S,T,a,u) Tailleur, I. L., Mamet, B. L., and Dutro, J. T., Jr., 1973, Revised age and structure interpretations of Nuka Formation at Nuka Ridge, northwestern Alaska: American Association of Petroleum Geologists Bulletin, v. 57, no. 7, p. 1348-1352. **** New collections of macrofossils and foraminifers indicates type section of the Nuka Formation has internal structural repetition. The Nuka formation is redefined as the arkosic unit from the middle of the previous type section.

(S,b) Tailleur, I. L., Mayfield, C. F., and Ellersieck, I. F., 1977, Late Paleozoic sedimentary sequence, southwestern Brooks Range, in Blean, K. M., ed., The United States Geological Survey in Alaska--Accomplishments during 1976: U.S. Geological Survey Circular 751-B, p. B24. **** Recognition of Lisburne Group rocks in the "schist belt" of Ambler River and Baird Mountains quadrangles. Rhyolites in NW Baird Mountains compared to Mississippian felsic volcanics at Drenchwater Creek. Speculation on northern source terrane for Paleozoic sediments of the western and central Brooks Range.

(E) Tailleur, I. L., Pessel, G. H., Brosgé, W. P., and Mayfield, C. F., 1976, Informal cooperation between U.S. Geological Survey and State of Alaska, Division of Geological and Geophysical Surveys in the Brooks Range, in Cobb, E. H., ed., The United States Geological Survey in Alaska--Accomplishments during 1975: U.S. Geological Survey Circular 733, p. 27-30. **** Status report of work by state and federal agencies in the western Brooks Range.

(S,u) Tailleur, I. L., and Sable, E. G., 1963, Nuka Formation of Late Mississippian to Late Permian age, new formation in northern

Alaska: American Association of Petroleum Geologists Bulletin, v. 47, no. 4, p. 632-642. **** Naming paper for the Nuka Formation, subsequently redefined (Tailleur, Mamet, and Dutro, 1973).

(T) Tailleur, I. L., and Snelson, Sigmund, 1966, Large-scale flat thrusts in the Brooks Range orogen, northern Alaska: Geological Society of America Special Paper 101, p. 127. **** Thrust juxtaposition of coeval rocks in the Brooks Range is described.

(T) Tailleur, I. L., and Snelson, Sigmund, 1969, Large-scale thrusting in northwestern Alaska possibly related to rifting of the Arctic Ocean: Geological Society of Americal Special Paper 121, p. 569. **** More than 150 miles of shortening due to southward underthrusting during counterclockwise rotation of northern Alaska, resulting from Jurassic rifting of the Canada Basin.

(E,r) Theobald, P. K., Barton, H. N., Billings, T. M., Frisken, J. G., Turner, R. L., and Van Trump, George, Jr., 1978, Geochemical distribution of elements in stream sediment and heavy mineral concentrate samples in the southern half of the National Petroleum Reserve, Alaska: U.S. Geological Survey Open-File Report 78-517. **** Contoured geochemical data for stream sediments for Ag, As, Ba, Cr, Pb, Zn.

(T,r) Turner, D. L., 1984, Tectonic implications of widespread Cretaceous overprinting of K/Ar ages in Alaska metamorphic terranes [abs.]: Geological Society of America Abstracts with Programs, v. 16, no. 5, p. 338. **** Similar metamorphic ages and metamorphic facies in rocks overthrust by ophiolites on opposite sides of the Yukon-Koyukuk Basin.

(T,a,b) Turner, D. L., Forbes, R. B., and Dillon, J. T., 1977, Summary and tectonic implications of radiometric dating in the southern Brooks Range, Alaska, in Sisson, A., ed., The relationship of plate tectonics to Alaskan geology and resources: Proceedings of Alaskan Geological Society Symposium, p. D1-D14. **** Seventy-six new K/Ar mineral ages from the schist belt in the southwestern Brooks Range suggest a Late Precambrian blueschist facies metamorphic event. Pervasive greenschist facies metamorphism reset most K/Ar mica ages to mid-Cretaceous.

(S,a,b) Turner, D. L., Forbes, R. B., and Dillon, J. T., 1979, K-Ar geochronology of the southwestern Brooks Range, Alaska: Canadian Journal of Earth Sciences Bulletin, v. 16, no. 9, p. 1789-1804. **** Seventy-six K/Ar ages from the southwestern Brooks Range, and interpretation.

(S,a,b) Turner, D. L., Forbes, R. B., and Mayfield, C. F., 1978, K-Ar geochronology of the Survey Pass, Ambler River, and eastern Baird Mountains quadrangles, southwestern Brooks Range, Alaska: U.S. Geological Survey Open-File Report 78-254, 41 p., scale 1:250,000.

(S,b,a) Turner, D. L., Grybeck, Donald, and Wilson, F. H., 1975, Radiometric dates from Alaska--A 1975 compilation: Alaska Division Geological Geophysical Surveys Special Report 10, 64 p. **** K/Ar age for biotite from tuff in southeastern Baird Mountains quadrangle is 83.4 m.y.

(E) U.S. Bureau of Mines, 1946, Analyses of Alaska coals, with a section on coal fields of Alaska, by George O. Gates: U.S. Bureau of Mines Technical Paper 682, 114 p. **** Coal crops out near Kiana, sampled in 1929.

(E) U.S. Bureau of Mines, 1978a, Mineral appraisal of the proposed Kobuk Valley National Park, Alaska--A preliminary comment: U.S. Bureau of Mines Open-File Report 110-78, 31 p. **** Map and table of known mineral occurrences in the southwestern Brooks Range; similar to OF 67-78.

(E) U.S. Bureau of Mines, 1978b, Mineral data appraisal of the proposed Noatak National Ecological Reserve, Alaska--A preliminary comment: U.S. Bureau of Mines Open-File Report 67-78, 33 p. **** Maps and table of known mineral occurrences in the western Brooks Range.

(E) U.S. Bureau of Mines, 1979, A mineral appraisal of the areas traversed by the Salmon and Noatak Rivers in the western Brooks Range--A summary report: U.S. Bureau of Mines Open-File Report 50-79, 16 p.

(S,T,a) U.S. Geological Survey, 1965, Geological Survey research 1965: U.S. Geological Survey Professional Paper 525-A, p. A15, A100-102. **** Late Devonian U/Pb age from granite/quartz monzonite in Romanzof Mountains. K/Ar age for Doonerak volcanic rocks yields 475 m.y. age. Mid-early Cretaceous and Laramide northward transport of large scale thrust sheets suggested for entire Brooks Range (Lathram).

(T) U.S. Geological Survey, 1966, Geological Survey research 1966: U.S. Geological Survey Professional Paper 550-A, p. 90-91. **** One, possibly two folded thrust sheets in the western Brooks Range.

(T,b) U.S. Geological Survey, 1967, Geological Survey research 1967: U.S. Geological Survey Professional Paper 575-A, p. 93. **** A thirty-five mile-long southwest plunging anticline in western Baird Mountains described. Possibly allochthonous thrust sequences are present in this area.

(S) U.S. Geological Survey, 1972, Lisburne Peninsula, in Geological Survey Research 1972: U.S. Geological Survey Professional Paper 800A, p. A50.

(E) U.S. Geological Survey, 1972, The status of mineral resource information on the major land withdrawals of the Alaska Native Claims Settlement Act of 1971: U.S. Geological Survey Open-File

Report 546, 164 p. **** Status report on knowledge of geology and mineral resource potential for each land withdrawal in the state of Alaska.

(S,b,a) U.S. Geological Survey, 1975, New graptolite locality indicates Lower Ordovician rocks in southwestern Brooks Range, in Geological Survey Research 1975: U.S. Geological Survey Professional Paper 975, p. 64. **** Report on graptolite ages in the Baird Group carbonates.

(S,a) U.S. Geological Survey, 1977, Geological Survey research 1977: U.S. Geological Survey Professional Paper 1050, p. 80-81. **** New fossil ages for the Permian and Triassic Echooka and Ivishak Formations. Pre-Mississippian angular unconformity interpreted beneath these formations.

(E) U.S. Geological Survey, 1983, 1983 annual report on Alaska's mineral resources: U.S. Geological Survey Circular 908, 48p.

(S) Whitmore, F. C., Jr., and Gard, L. M., Jr., 1977, Steller's sea cow (Hydrodamalis gigas) of late Pleistocene age from Amchitka, Aleutian Islands, Alaska: U.S. Geological Survey Professional Paper 1036, 19 p. **** Steller's sea cow skeleton found on lower Noatak River.

(S,m) Wilson, F. H., and Turner, D. L., 1975, Radiometric age map of Alaska--Nothern Alaska: Alaska Division Geological Geophysical Surveys Open-File Report AOF-86, 11 p., 1 sheet, scale 1:1,000,000. **** (See Turner and others, 1975).

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(E) Wiltse, M. A., 1977, Volcanogenic massive sulfides of the Ambler District, Alaska [abs.]: Geological Association of Canada Program with Abstracts, v. 2, p. 55.

(E) Wiltse, M. A., and Gilbert, W. G., 1977, Regional setting of southern Brooks Range deposits [abs.]: Geological Association of Canada program with Abstracts, v. 2, p. 55.

(T) Yorath, C. J., and Norris, D. K., 1975, The tectonic development of the southern Beaufort Sea and its relationship to the origin of the Arctic Ocean Basin, in Yorath, C. J., Parker, E. R., and Glass, D. J., eds., Canada's continental margins and offshore petroleum exploration: Canadian Society of Petroleum Geology Memoir 4, p. 589-611. **** Interpretation of geologic, seismic, gravity, and magnetic data with respect to translational and extensional tectonics in the vicinity of MacKenzie Delta and the Canada Basin.

(E,r) Zdepski, J. M., 1980, Stratigraphy, mineralogy and zonal relations of the Sun massive sulfide deposit, Ambler District, northwest Alaska: unpublished M.S. thesis, University of Alaska, Fairbanks, 93 p. **** Describes the easternmost volcanogenic deposit of the district (Survey Pass quadrangle).

(I,r) Zimmerman, Jay, and Frank, C. O., 1980, Geology of the Avan Hills ultramafic complex, Brooks Range, Alaska [abs.]: Geological Society of America Abstracts with programs, v. 12, no. 7, p. 554. **** Avan Hills ultramific complex interpreted as allochthonous body of ophiolite consisting of dunite, harzburgite, and clinopyroxenite tectonite, a transition zone, and overlying layered gabbros.

(M,I,T,r) Zimmerman, Jay, and Frank, C. O., 1982, Possible ophiolite obduction-related metamorphic rocks at the base of the ultramafic zone, Avan Hills complex, De Long Mountains, in Coonrad, W. L., ed., The United States Geological Survey in Alaska--Accomplishments during 1980: U.S. Geological Survey Circular 844, p. 27-28. **** High temperature, low pressure metamorphism of lower thrust sheet attributed to obduction of Avan Hills ultramafic complex.