INVESTIGATION OF THE PURKEYPILE PROSPECTS, KUSKOKWIM RIVER BASIN, ALASKA

by R. P. Maloney and Bruce I. Thomas

* open-file report

UNITED STATES DEPARTMENT OF THE INTERIOR

Stewart L. Udall, Secretary

BUREAU OF MINES

Walter R. Hibbard, Jr., Director

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INVESTIGATION OF THE PURKEYPILE PROSPECTS, KUSKOKWIM RIVER BASIN, ALASKA

by

R. P. Maloney[1] and Bruce I. Thomas[1]

ABSTRACT

The Purkeypile prospects, near the western boundary of Mt. McKinley National Park, were examined in 1964 to evaluate reported additional mineralization and to determine if further work by the Bureau would be feasible. There are three prospects: The Jiles-Knudson, the Mespelt, and the Hogback. Lead-silver mineralization occurs in altered sediments and adjacent to granitic intrusives. The Hogback prospect appeared to be the most promising of the three, but mineral occurrences were not considered extensive enough for additional work by the Bureau. This report contains much of the pertinent data and maps of earlier reports by Bruce I. Thomas.

INTRODUCTION

These prospects were investigated during the 1948, 1959, and 1964 field seasons as part of the Department of the Interior continuing program for the development of Alaska's resources. Additional mineralization was reported to have been found since these prospects were examined in 1948 and 1959; however, this investigation did not produce any new information. Examinations of these deposits have also been made by the U.S. Geological Survey, the Alaska Division of Mines and Minerals, and private consultants. Published reports are listed in the bibliography.

ACKNOWLEDGMENTS

The base maps were adapted from maps by the U.S. Geological Survey. Acknowledgment is made to David Purkeypile of Fairbanks, Alaska for his assistance in making this examination.

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Work completed on manuscript October 1965.

LOCATION AND ACCESSIBILITY

The geographical center of these three prospects is approximately latitude 62°54' N and longitude 152°14' W. They are in the Talkeetna quadrangle, near the southeast corner of Mt. McKinley National Park, and on the west side of the headwaters of Boulder Creek, a small tributary of, and near the head of the Swift Fork Kuskokwim River (figs. 1, 2, and 3). There are no roads leading to this isolated section of interior Alaska. An airstrip about 2,000 feet long and suitable for light planes has been brushed out on a gravel bar of Camp Creek, a small tributary of Boulder Creek. This strip could easily be enlarged to about 3,000 feet; it is probably flooded every spring. It would not be difficult to make a 5,000- to 6,000-foot airstrip on the nearby gravel bars. The nearest airport for large multi-engine planes is at Lake Minchumina 75 miles due north. Small float planes can land on several small lakes within a few miles of the prospects. All landing areas, both water and ground, are about 2,000 feet in elevation. A crawler-type tractor has been brought overland from Fairbanks during the winter. A road from the landing strip winds about 6 to 7 miles up to the prospects. It has a steep grade but can be traveled by a 4-wheel-drive vehicle.

HISTORY

Between 1921 and 1923, F. B. Jiles and Ed Knudson of Poorman, Alaska prospected in the vicinity of Boulder Creek and concentrated their efforts on the Jiles-Knudson prospect on the west side of this stream (fig. 3). About this time, Adolph and Charles Mespelt of McGrath found galena float on a talus slope about 2-1/2 miles west of the Jiles-Knudson prospect and worked their prospect for two seasons (fig. 3). Activity in the area ceased until the summer of 1947 when I. W. Purkeypile started to prospect the area. This work has continued sporadically up to the present time, and has resulted in the discovery of the Hogback prospect and the construction of the tractor road (figs. 3, 4, and 5). The area has been examined by the U.S. Geological Survey and by several private companies. Data from these examinations have not been published. It was first examined by the Bureau in 1950 (F. A. Rutledge, file and correspondence) and again in 1948 and 1959 by Bruce I. Thomas. There has been no mineral production from these prospects.

PHYSICAL FEATURES AND CLIMATE

This is an area of steep rugged mountains along the north slope of the Alaska Range and facing the broad, flat valleys of the North and South Fork Kuskokwim Rivers. The average elevation is about 6,000 feet with numerous peaks over 7,000 feet. High peaks, south and east in the Alaska

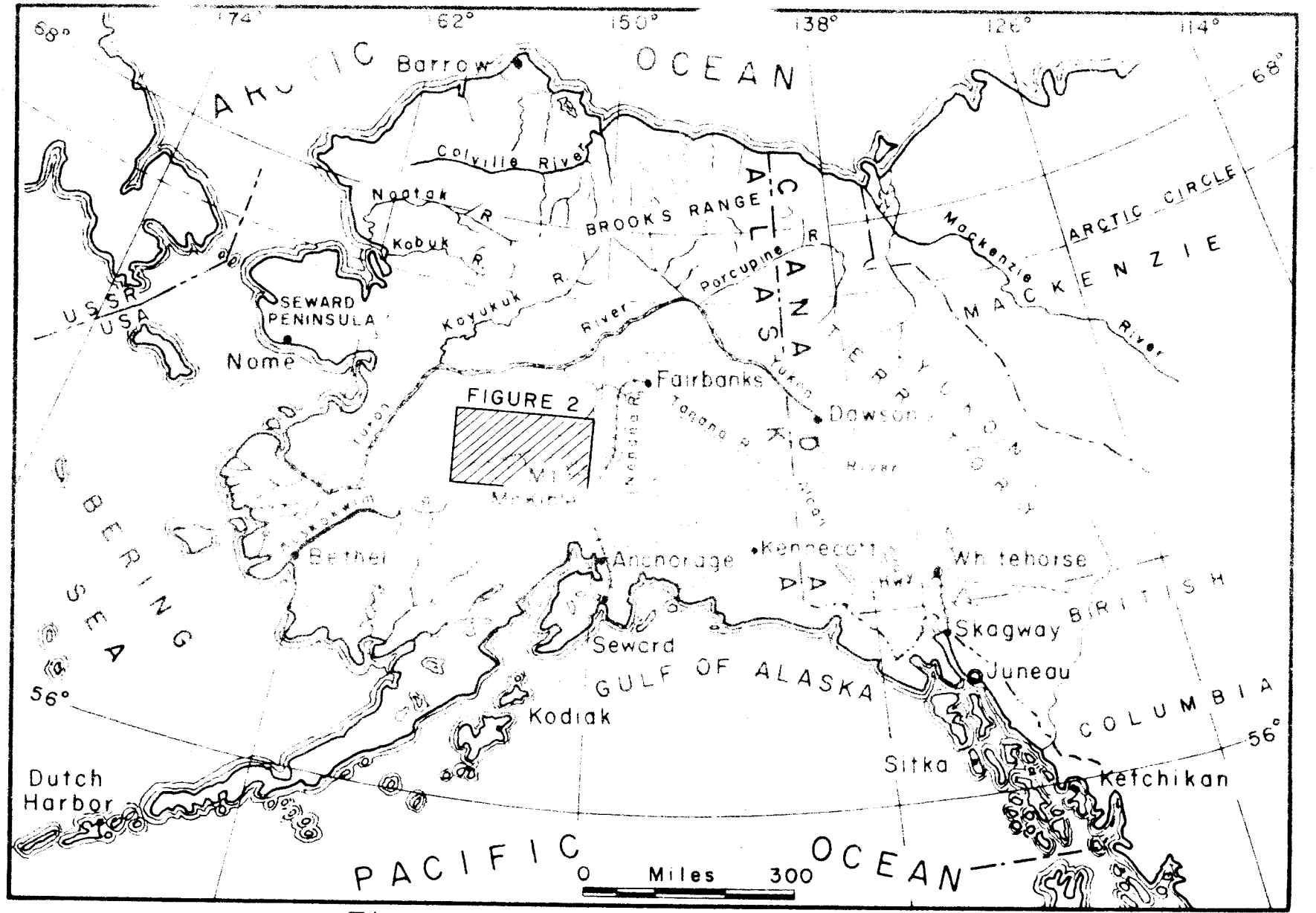

Figure 1.—Index map of Alaska.

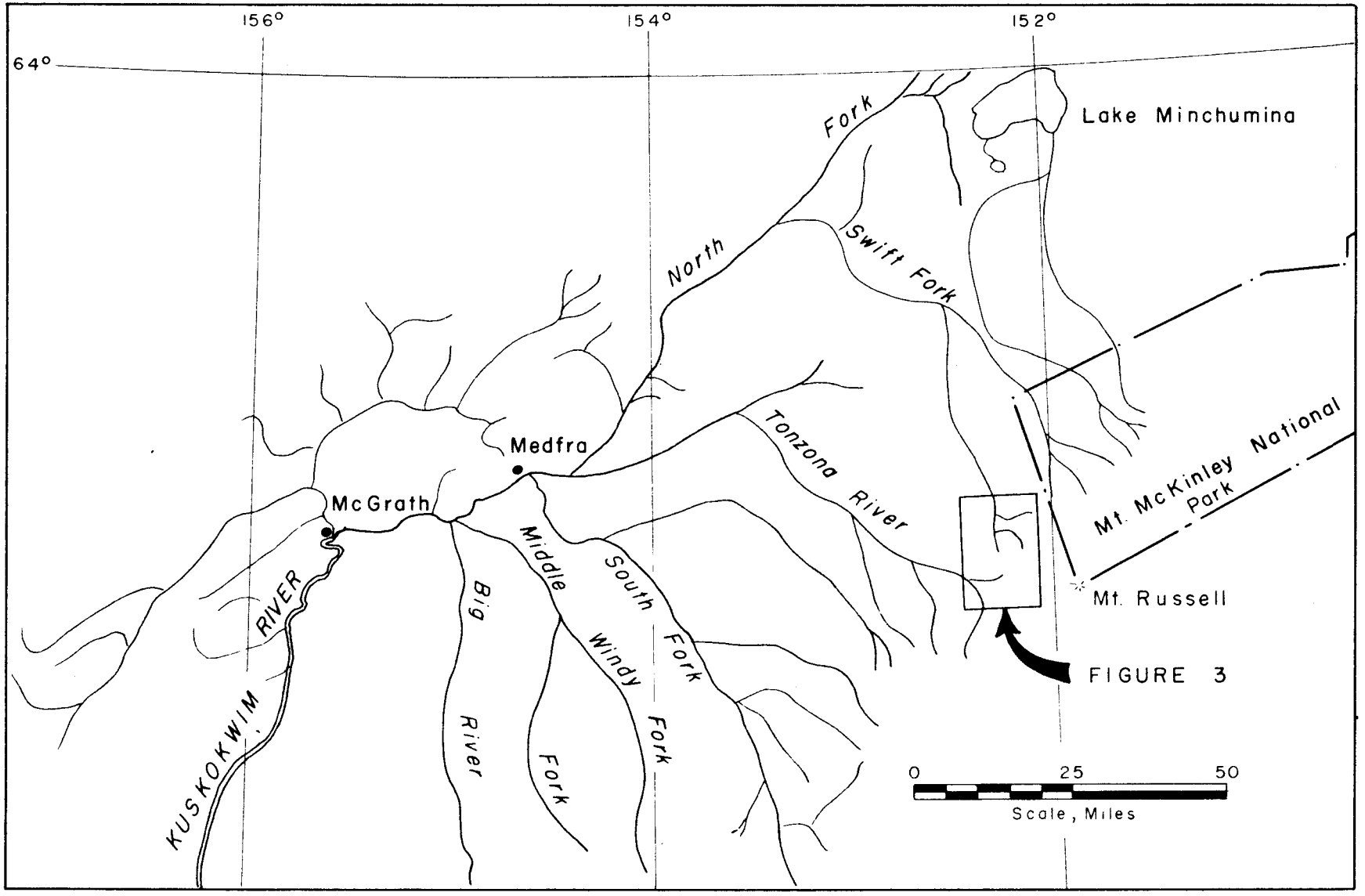

FIGURE 2.- Index Map, Purkeypile Prospects, Alaska.

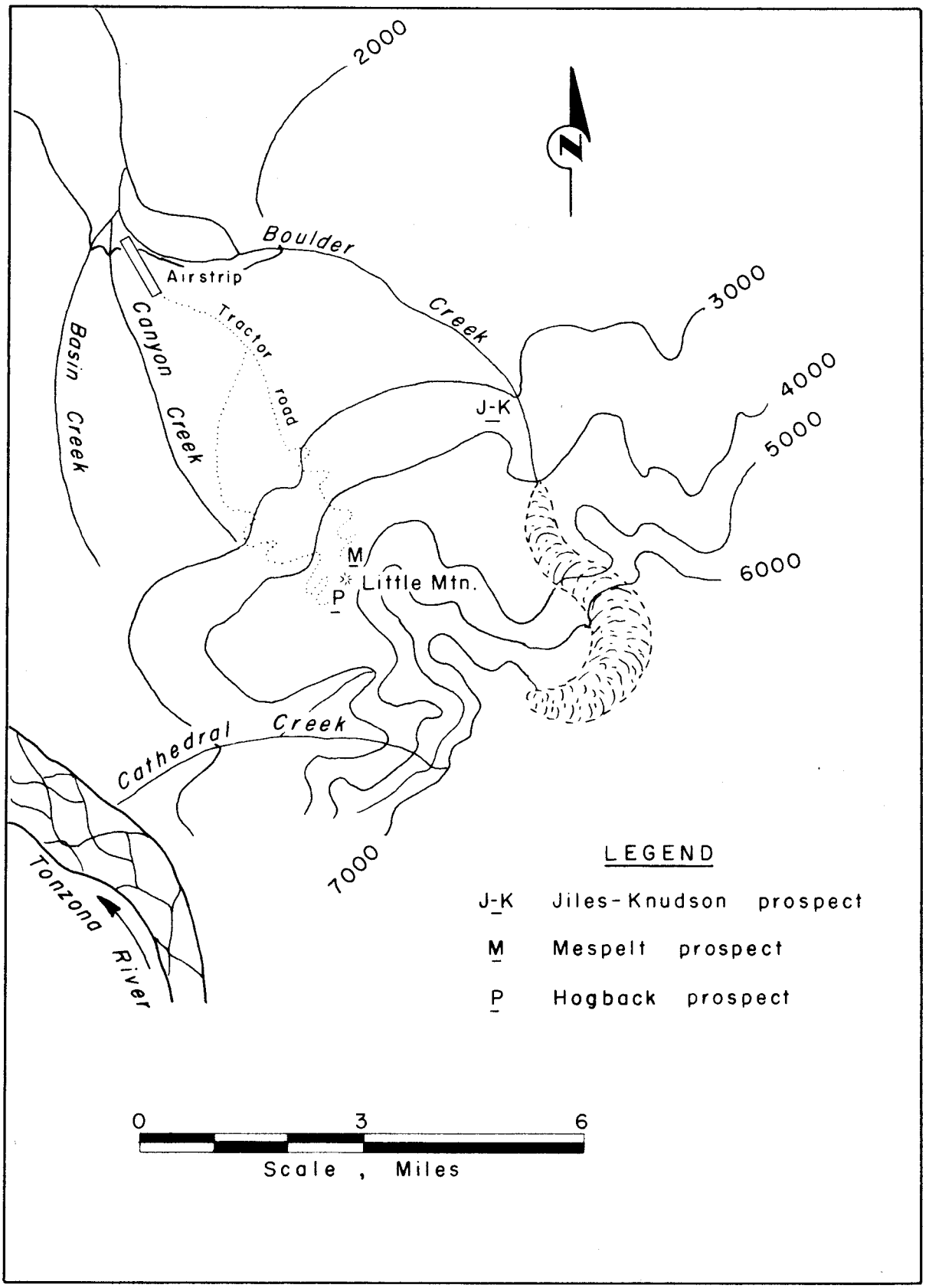

FIGURE 3.–Location Map, Purkeypile Prospects, Alaska.

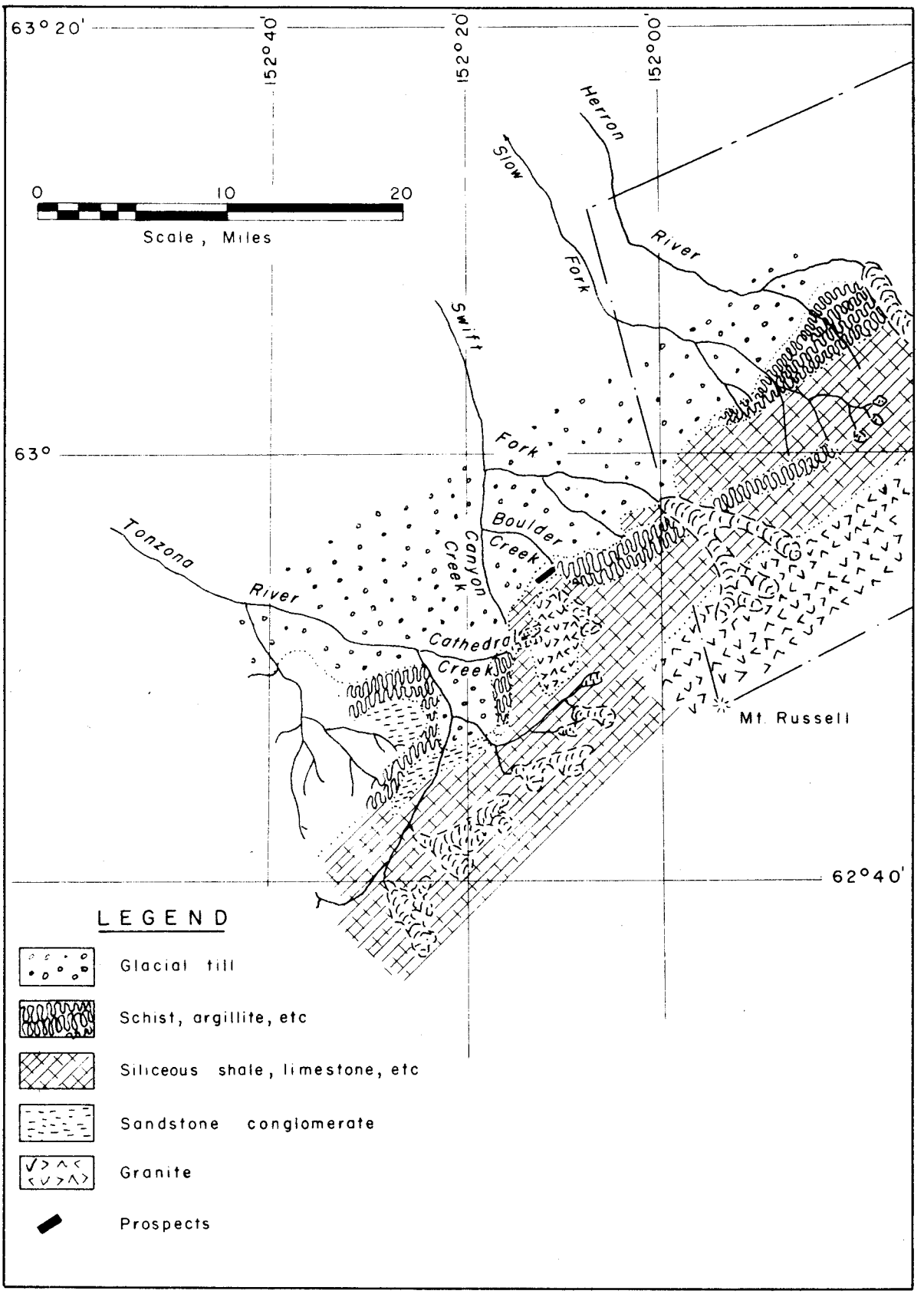

FIGURE 4.-Geology, Purkeypile Prospect, Alaska.

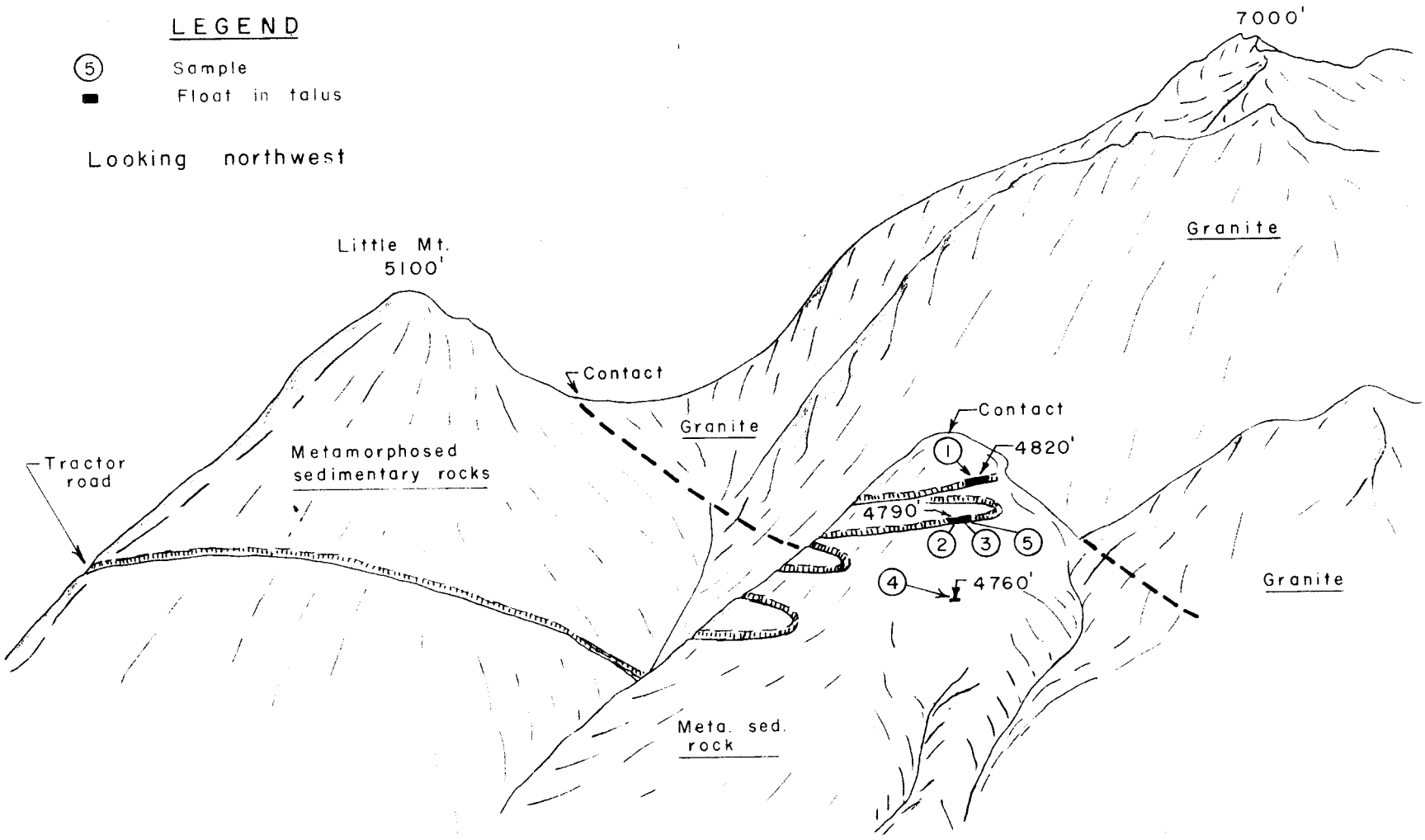

FIGURE 5.- Sketch of Hogback Prospect, Alaska.

Range, have altitudes considerably in excess of 10,000 feet; Mt. McKinley is about 40 miles to the east. Intense glaciation and glacial features dominate the topography. The transition from mountains to the flat alluvial plain is abrupt.

Timber grows to an altitude of about 2,500 feet and consists of spruce up to 12 inches in diameter; alder, willow, dwarf spruce, and poplar are sometimes found along small streams up to an altitude of about 3,000 feet. No timber whatsoever is found at the prospects. The hills and morains are moss covered.

The climate is sub-Arctic with long, extremely cold winters and comparatively warm summers. Precipitation in the area is probably about 20 inches. High winds and small freak whirlwinds are frequent.

Brown bear, caribou, moose, rabbits, squirrels, porcupine, wolverine, sheep, grouse, ptarmigan, ducks, geese, and curlew are numerous. Trout are plentiful in the many lakes and streams.

EQUIPMENT

A good D-8 tractor and go-devil, are at a tarn lake near the Mespelt property and a 4-wheel-drive power wagon in fair condition is left at the airstrip. A Failing diamond drill, Model 43S, Order No. 42-1235, Shop No. 615, made in 1944, and with NX chuck was also at the airstrip. It appeared to be in good condition, is mounted on skids, but no tools, rods, etc., were seen. A Northern 50 watt radio and transmitter, generator, and miscellaneous small tools are at the tarn lake. High winds or a whirlwind have completely destroyed the wanigan at the tarn lake and all equipment is exposed to the elements.

GENERAL GEOLOGY

The following description is from the reports listed in the bibliography. Formations include argillite, slate, thin-bedded limestone, schist, intruded by light colored granites (fig. 4). Silification of the intruded rocks is pronounced. Bedding planes strike northeast and are almost vertical. Serpentine occurs as dikes in schist and argillite. Devonian schist is probably the oldest formation. This is believed to be overlain by Paleozoic, Mesozoic, Cretaceous, and Tertiary formations of sedimentary origin. Evidence of faulting as seen by the writer appeared to have been minor.

MINERAL OCCURRENCES

Hogback Prospect

This has also been called the Purkeypile or Little Mountain prospect, and appears to be the most important of the three prospects (figs. 3 and

5). Lead, silver, zinc, and a trace of gold occur in a dolomitic quartzite. Workings consist of several bulldozer cuts across a steep talus slope on the flank of a small knob that abuts the granite. All trenches were filled with talus and no bedrock was exposed; about a half day was spent in bulldozing to bedrock above the old trenches. The talus consists of quartzite, siliceous limestone, slate and schist. A rock glacier of very large granitic blocks that could not be moved by a tractor or drilled through is adjacent to this prospect.

A 32-foot wide zone was channel sampled across the top of the mineralized lens or pod. Chemical and petrographic analyses of these samples are found in tables 1 and 2; chemical assays of grab and chip samples of float taken by Bruce I. Thomas in 1959 are in table 1.

In this dozer cut, three separate veins or zones appeared to be the most highly mineralized. They seemed to trend at an angle that would bring them together in another 100 feet downslope. The strike of this zone is N 35° E.

No mineralized float was seen in the talus above this dozer cut; neither was any seen below except that which probably came from old dozer cuts and this was not abundant.

The mineralization seems to be a small pod; other similar pods may be found in the area. A tractor road leads to this prospect from the Maspelt prospect. Water would be a major problem if any sizeable volume is required, as in diamond drilling.

TABLE 1. - Chemical analyses, Hogback prospect

Sample No. 1/	Interval, feet	Width, feet	Description	Oz/ton		Percent		
				Ag	Au	Pb	Zn	Cu
1	0.0- 6.0	6.0	Altered quartzite adjacent to granite rock glacier, southeast end trench.	0.08	0.02	0.05	0.10	
2	6.0- 7.0	1.0	White clay, could be smithsonite.	.18	Nil	<.05	19.30	
3	7.0- 8.0	1.0	Quartzite.....	1.38	.04	.10	.36	
4	8.0- 9.2	1.2	Galena-quartz.....	32.20	Tr.	5.62	10.32	
5	9.2-15.5	6.3	Quartzite.....	.62	Nil	.05	.11	
6	15.5-16.5	1.0	Galena-quartz.....	31.32	Nil	5.70	12.00	
7	16.5-22.0	5.5	Fractured quartzite, light bluish color, soft, iron stain.	.26	.02	<.05	.14	
8	22.0-25.0	3.0	Altered quartzite, yellowish clay, iron stain, lens of smithsonite.	32.88	.02	2.89	2.32	
9	25.0-32.0	7.0	Darker gray, altered quartzite, lens of smithsonite.	4.90	Tr.	1.04	5.75	
10			Wall rock in northwest end trench.	.14	.02	<.05	9.24	
11			Type specimen of zinc mineralization.	19.30	Tr.	.02	31.50	
1T			Chip.....	96.19	.04	44.4	8.7	0.42
2T			.....do.....	118.22	.04	61.3	7.2	.26
3T			Grab.....	12.58	.01	3.4	36.0	.08
4T			.....do.....	134.76	.04	67.2	-	.42
5T			Chip.....	65.58	.04	39.6	7.4	1.20

1/ Samples 1 through 11 were taken by R. P. Maloney in 1964; samples 1T through 5T were taken by Bruce I. Thomas in 1959. The location of the samples taken by Mr. Thomas are shown in figure 5.

TABLE 2. - Petrographic analyses, Purkeypile prospects[1/]

Sample No.	1	8	10	11	12	13	14A	14B	15A	15B	15C	16	17	18	19	20A	20B	21
Rock classification:																		
Biotite schist	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	C
Gneiss	-	-	-	-	-	-	-	-	-	C	-	-	-	-	-	-	-	-
Gossan	-	-	-	-	-	-	-	C	-	-	-	-	-	C	C	-	C	-
Granite	-	-	-	-	C	-	-	-	C	-	C	C	-	-	-	C	-	-
Quartzite	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfide vein	-	-	-	C	-	C	-	-	-	-	-	-	-	-	-	-	-	-
Tourmaline vein	-	-	-	-	-	-	C	-	-	-	-	-	-	-	-	-	-	-
Vein quartz	C	C	C	-	-	-	-	-	-	-	-	-	C	-	-	-	-	-
Minerals:																		
Albite	-	-	-	-	A	-	-	-	A	-	S	A	-	-	-	S	-	-
Arsenopyrite	-	-	-	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-
Biotite	-	-	-	-	S	-	-	-	-	-	-	M	-	-	-	S	-	P
Calcite	-	-	-	S	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chalcopyrite	-	T	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorite	F	M	F	-	S	-	-	-	-	-	-	S	-	-	-	-	-	-
Covellite	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Epidote	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorite	S	-	-	-	-	-	-	-	-	-	-	F	-	-	-	-	-	-
Galena	-	M	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Goethite	M	F	M	F	M	M	T	P	S	S	S	-	M	P	P	S	P	M
K-feldspar	-	-	S	-	A	-	-	-	A	-	A	A	-	-	-	A	-	-
Muscovite	F	-	S	-	-	F	-	-	T	A	A	-	A	-	-	-	-	-
Pyrite	-	-	-	-	-	-	-	-	T	-	-	-	-	-	-	-	-	-
Pyrrhotite	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Quartz	P	P	P	A	A	A	A	S	A	P	A	A	P	-	T	A	A	A
Rhodochrosite-siderite	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scorodite	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-
Smithsonite	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sphalerite	-	S	T	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tourmaline	-	-	-	-	-	-	P	-	-	T	-	T	-	S	M	-	M	-

1/ Description of samples in tables 1, 3, and 4.

Legend:
- P - Predominant — more than 50 percent
- A - Abundant — 10 - 50 percent
- S - Subordinate — 2 - 10 percent
- M - Minor — .5 - 2 percent
- F - Few — .1 - .5 percent
- T - Trace — less than .1 percent
- C - Rock classification.

TABLE 2. - Petrographic analyses, Purkeypile prospects--continued[1/]

Sample No.	21	22	23	24	25	26	26A	27A	27B
Rock classification:									
Biotite schist	C	-	-	-	-	-	-	-	-
Gneiss	-	-	-	-	-	-	-	C	-
Gossan	-	C	C	C	-	C	-	-	C
Granite	-	-	-	-	-	-	-	-	-
Quartzite	-	-	-	-	-	-	-	-	-
Sulfide vein	-	-	-	-	C	-	C	-	-
Tourmaline vein	-	-	-	-	-	-	-	-	-
Vein quartz	-	-	-	-	-	-	-	-	-
Minerals:									
Albite	-	-	-	-	-	-	-	-	-
Arsenopyrite	-	-	-	-	P	-	-	-	-
Biotite	P	-	-	-	-	-	F	A	-
Calcite	-	-	-	-	-	-	-	-	-
Chalcopyrite	-	-	-	-	T	-	T	-	-
Chlorite	-	-	-	-	-	-	-	S	-
Covellite	-	-	-	-	T	-	-	-	-
Epidote	-	-	-	-	-	-	-	M	-
Fluorite	-	-	-	S	-	-	-	-	S
Galena	-	T	-	-	-	-	-	-	-
Goethite	M	P	A	A	-	P	M	S	A
K-feldspar	-	-	-	-	-	-	-	M	-
Muscovite	-	-	-	-	-	-	-	-	-
Pyrite	-	-	-	-	A	-	-	-	-
Pyrrhotite	-	-	-	-	-	-	P	-	-
Quartz	A	A	A	A	S	S	M	P	A
Rhodochrosite-siderite	-	A	P	-	-	-	-	-	-
Scorodite	-	-	-	-	A	-	-	-	-
Smithsonite	-	-	-	-	-	-	-	-	-
Sphalerite	-	-	-	-	-	-	-	-	-
Tourmaline	-	-	-	-	-	-	-	-	-

See footnote and legend on preceding page.

Meshbelt Prospect

This prospect, approximately 2-1/2 miles west of the Jiles-Knudson prospect, is on the west flank of the rugged mountains facing the North and South Fork Kuskokwim Rivers and at an altitude of about 4,500 feet. A steep and winding truck and tractor road about 4 to 5 miles long leads to it from the airstrip. The only water available is from a small tarn lake about 1/2 mile south. A shaft reported to be 40 feet deep, but now caved, and a bulldozer cut, are the extent of the workings. The prospect is in granite near the contact with the siliceous limestone, limestone, shale, and schist. Geologic details are effectively concealed by talus. Considerable gossan is evident

but it is probably a fairly shallow capping. Significant mineralization was not found. Petrographic and chemical analyses of samples taken in 1964 are found in tables 2 and 3. Chemical analyses of grab and chip samples taken by Bruce I. Thomas in 1959 are in table 3 and petrographic analyses of these samples are in table 4.

TABLE 3. - Chemical analyses, Mespelt prospect[1/]

Sample No.	Description	Oz/ton		Percent						
		Ag	Au	Pb	Bi	eU	Cu	Sb	Sn	W
12	Altered granite.....	0.08	Nil		0.02					
13	Greenish gossan.....	.72	0.02		.04					
14	Gossan and tourmaline	Tr.	Nil	5.86						
15	Gossan and granite.....	Nil	Nil							
16	Type granite (petrographic analysis, table 2).									
17	Weathered quartz (petrographic analysis, table 2).									
18	Black gossan (petrographic analysis, table 2).									
19	.....do.....									
20A	.....do.....									
20B	.....do.....									
21	Biotite schist (petrographic analysis, table 2).									
6T	Thomas, 1959, grab of talus.	82.91	.01				0.42	2.52		
7T	Thomas, 1959, chip of talus.	29.23	Tr.			0.075	<.05		<0.03	0.01
8T	.....do.....	1.87	Tr.			.14	<.05		.06	.04
9T	Thomas, 1959, grab of talus.	1.75	Tr.			.073	<.05		<.03	.02
10T	.....do.....	10.71	Tr.			.039	<.05		<.03	.03
11T	.....do.....	.18	Tr.			.037	<.05		<.03	.02

1/ Samples 12 to 21 were taken by R. P. Maloney in 1964. The location of the samples taken by Bruce I. Thomas in 1959 is shown on figure 6.

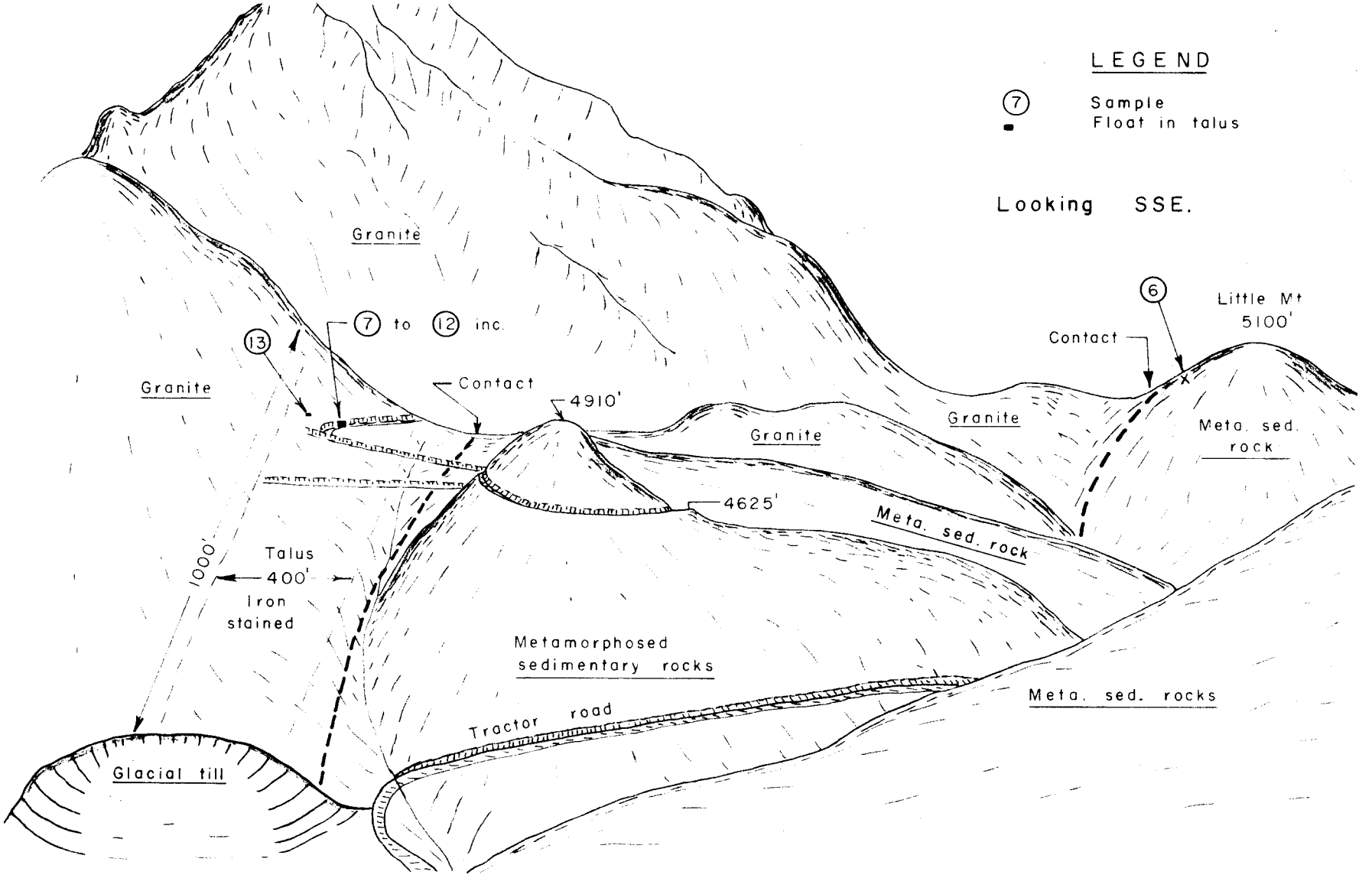

FIGURE 6.– Sketch of Mespelt Prospect, Alaska.

TABLE 4. - Petrographic analyses, Maspelt prospect[1/]

Sample No.	Analysis
6	Sample is composed of galena, sphalerite, and quartz. Traces of limonite and pyrite were present.
7	Sample consists of quartz and goethite derived from siderite with associated uranium. A trace of lead and zinc is present.
8	.....

1/ Samples taken by Bruce I. Thomas in 1959.

Jiles-Knudson Prospect

This prospect occurs in schist near the granite contact and about 1/2 mile below the Boulder Creek Glacier (fig. 3). There is no road or trail to the prospect. Work has been done on two separate mineral occurrences in this locality.

A lens of ferriferous dolomite is exposed for about 30 feet in a cut bank on Boulder Creek; it occurs in schist. It strikes N 86° E and has a vertical dip, and parallels the plane of schistosity. Pyrite and arsenopyrite were the chief sulfides; considerable goethite was also present. Chemical assays of specimen samples of the most mineralized sections showed minor amounts of gold, silver, and lead. Bruce I. Thomas (5)[2/] reported a sample, 10 feet long, across the mineralized body assayed 2 ounces of silver and a trace of gold. Chemical and petrographic analyses are in tables 2 and 5.

A shaft 7 x 5 x 15 feet deep, now filled with water, is sunk on the prospect. Much of the material from this shaft has been removed. Several small hand-dug trenches are within a few feet of the shaft. Mr. Purkeypile did some diamond drilling with a packsack-type drill in 1958. A minor amount of diamond-drill core is scattered about the shaft.

About 250 feet south of this shaft a 7- x 5-foot adit 11 feet long has been driven across a pyrrhotite body exposed for about 100 feet in the cut bank of the creek. This body is about 11 feet wide, strikes N 85° E, and dips 80° to the east; about 30 feet of the vertical dip is exposed. A chip sample taken in 1959 (4) assayed a trace of gold and no silver, qualitative tests did not reveal the presence of other minerals. A channel sample taken in 1964 assayed 0.78 ounce of silver and no gold; spectroscopic and petrographic analyses indicated only a trace of nickel, copper, and zinc.

2/ Underlined numbers in parentheses refer to items in the bibliography at the end of this report.

TABLE 5. - Chemical analyses, Jiles-Knudson prospect

Sample No.	Description	Oz/ton Ag	Oz/ton Au	Percent Pb
22	Black gossan, long quartz crystals at shaft dump..	0.64	Nil	0.96
23	Black gossan at shaft dump.....	Nil	Nil	.02
24	.....do.....	3.22	Nil	.44
25	0.3-foot pyrite vein, west side of shaft.....	.04	Nil	
26	Grab sample, gossan in small trench 10 feet above shaft.	.78	Nil	
26A	11-foot wide pyrrhotite vein, no nickel, taken in adit.	.78	Nil	
27	Type country rock on hanging wall of a pyrrhotite vein in adit; petrographic analyses only.	Nil	0.96	

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