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Geology and Mineralogy

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UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

RECONNAISSANCE FOR RADIOACTIVE DEPOSITS IN THE FORTYMILE DISTRICT, EAST-CENTRAL ALASKA, 1949*

By

Helmuth Wedow, Jr. and Gene E. Tolbert

December 1953

Trace Elements Investigations Report 196

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*This report concerns work done on behalf of the Division of Raw Materials of the U. S. Atomic Energy Commission.

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By Helmuth Wedow, Jr. and Gene E. Tolbert

ABSTRACT

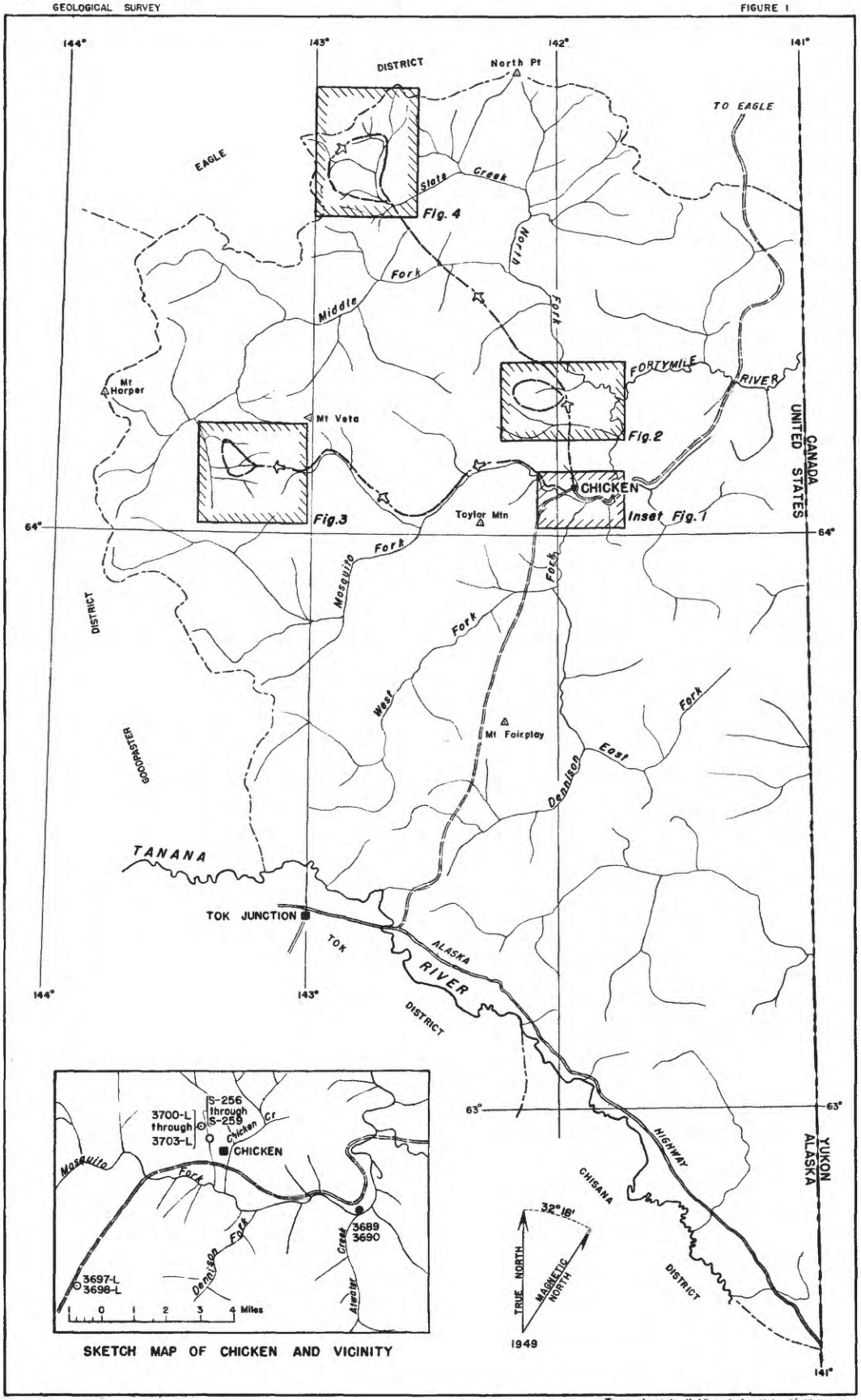
A reconnaissance was conducted in the Wilson Creek, My Creek, and Ben Creek areas, Fortymile district, east-central Alaska, in 1949 in an attempt to locate three occurrences of high-grade uranium ores reported by prospectors. The search was unsuccessful. A maximum of 0.005 percent equivalent uranium was found in felsic igneous rocks of the Wilson Creek and Ben Creek areas. The radioactivity of these rocks in the Wilson Creek area is probably due to traces of radioactive elements in the common accessory minerals of the igneous rocks; in the Ben Creek area it is probably due chiefly to thorium in monazite and allanite, which were identified in concentrates from gravels of streams draining areas underlain by the igneous rocks. Radioactivity tests of Tertiary sedimentary rocks in the vicinity of Chicken show that a sulfide-bearing montmorillonite-type clay contains as much as 0.005 percent equivalent uranium and that coked(?) coal and ash from a burned coal bed contain as much as 0.003 percent equivalent uranium. A concentrate from a gold-placer deposit at Atwater Bar, a short distance east of Chicken, submitted by a prospector contains traces of uranothorianite and monazite and has an equivalent uranium content of 0.027 percent.

INTRODUCTION

The purpose of this report is to give the results of reconnaissance in the Forty-mile district, east-central Alaska (fig. 1) conducted in 1949 to investigate three possible occurrences of high-grade uranium ores reported by prospectors. These reported occurrences were in the vicinity of Wilson Creek (fig. 2), My Creek (fig. 3), and Ben Creek (fig. 4). Limited additional studies were made in the vicinity of Chicken as time permitted. (See inset, fig. 1.) The work was done on behalf of the Division of Raw Materials of the U. S. Atomic Energy Commission by a Geological Survey party consisting of Helmuth Wedow, Jr. and G. E. Tolbert, geologists, and Fred Freitag, camphand. The party was in the field from July 22 to August 20, 1949.

At the request of the Atomic Energy Commission, the U. S. Air Force detailed a helicopter and its crew and provided such other air support as was necessary to assist the Survey party in its operations. The assistance of the members of Detachment "B", 10th Rescue Squadron, U. S. Air Force, in developing the details of the air support furnished the Survey party is gratefully acknowledged. Lt. Murl Chamberlin and Sgt. Walter Embree, pilot and mechanic respectively, were the military personnel detailed directly to the Survey project. The type of helicopter used in the support was a Sikorsky, model H5G.

The Fortymile district lies in east-central Alaska. (See key map, fig. 1.) Most of the district is drained by the Fortymile River and its tributaries (fig. 1). The town of Chicken is the only settlement of consequence within the district, although many placer-mining camps are scattered throughout the northeastern part of the district and homesteads are being claimed along the Alaska Highway on the southern edge of the district. Chicken is accessible by air by regularly scheduled flights from Fairbanks



SKETCH MAP OF CHICKEN AND VICINITY

EXPLANATION

Helicopter flight

Approximate location Taylor (Fortymile) Highway (under construction)

⊙-3697-L
Igneous rock sample

○-S-256
Sedimentary rock sample

●-3689
Placer concentrate

Base from U. S. Geol. Survey Bull. 672, pl. 1

Trace elements field work by Helmuth Wedow, Jr., and Gene E. Tolbert, 1949.

10 0 10 20 30 40 Miles

SKETCH MAP OF THE FORTYMILE DISTRICT EAST-CENTRAL ALASKA

and, since September 1949, by ground traffic along the newly constructed southern portion of the Taylor (Fortymile) Highway (fig. 1). Other parts of the Fortymile district are relatively inaccessible, as the few other small airfields in the district are located mostly at the mining camps.

For the investigation of the Wilson Creek and My Creek areas the helicopter-supported Geological Survey party was based near the airstrip at Chicken, and daily flights were made out to the areas under study. For the reconnaissance in the Ben Creek area a temporary advance base was established on Slate Creek at the mouth of Gold Run.

RADIOACTIVITY MEASUREMENTS

The radioactivity of rocks in the areas of the reported high-grade uranium occurrences in the Fortymile district was measured with high-count traverse probes consisting of six 1- by 14 inch gamma tubes connected in parallel and attached to modified commercial models of portable survey meters. For convenience in carrying on foot-traversing the counters and probes were lashed to packboards, and the rate-meters were attached to cables and carried by hand in front of the operator. The basic instrument response (background) in the field over most sedimentary and metamorphic rocks averaged about 900 counts per minute, or a rate meter reading of about 5 scale divisions on the 2.0 mr/hr range.

In each area investigated selected samples were taken from rocks that exhibited radioactivity above the basic instrument response. The samples were later analyzed for their equivalent uranium content by the authors in the laboratory.

AREAS INVESTIGATED

Wilson Creek area

General statement

In 1948 the Alaska Territorial Department of Mines reported that Mr. Charles Fillyez, former Alaskan prospector, had information about a pitchblende occurrence in the Fortymile district. When questioned early in 1949 by W. S. Twenhofel of the Geological Survey, Fillyez indicated that in 1919 he had found a heavy black mineral in a vein on the crest of the ridge west of the confluence of the North and South Forks of the Fortymile River in the vicinity of Wilson Creek (fig. 2). The mineral subsequently was identified as pitchblende by Mr. Seymour, a private assayer in Fairbanks, now deceased. Fillyez stated further that an old trail leading westward along the ridge toward Wilson Creek from the confluence of the forks would lead to the vein. Scattered remnants of this trail were located along this ridge in the course of the reconnaissance in 1949.

Geology

The geology of the Wilson Creek area has been mapped by reconnaissance methods by Prindle (1909, pl. 2; 1913, pl. 2) in the course of studies of the Fortymile and Circle quadrangles. The bedrock consists of the pre-Cambrian Birch Creek schist and granitic intrusives of Mesozoic(?) age (fig. 2). The Birch Creek schist is predominantly a quartz-mica schist, but locally contains such metamorphic rock types as quartzite, coarse-crystalline marble, and micaceous and chloritic schists. Small dikes and sills of intrusive granite, apparently offshoots of the large igneous mass at

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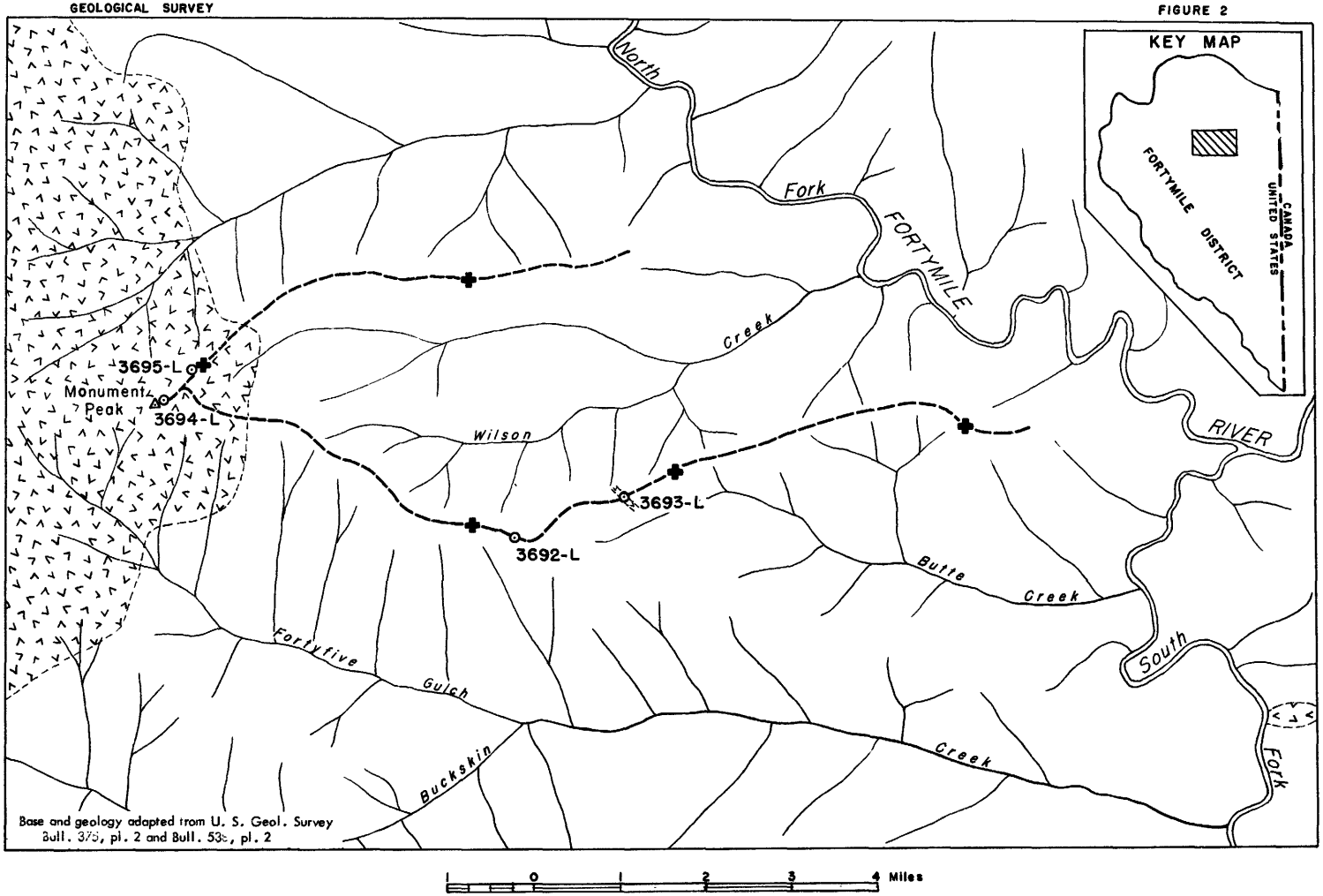
FIGURE 2



EXPLANATION

Granite

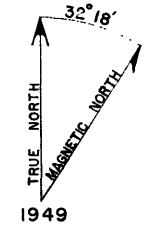
Birch Creek schist

Radioactivity traverse

Helicopter landing

⊙-3692-L

Sample location



GEOLOGIC SKETCH MAP OF THE WILSON CREEK AREA FORTYMILE DISTRICT, ALASKA

Monument Peak (fig. 2), and quartz veins of unknown age and origin occur in the area mapped as Birch Creek schist, but their small size prevents their being distinguished separately on the map.

Radioactivity studies

Approximately 17 miles of foot-traversing were made along the ridges in the vicinity of Wilson Creek (fig. 2) west of the confluence of the North and South Forks of the Fortymile River in an attempt to locate the reported Fillyez pitchblende occurrence. No significant radioactivity anomaly was detected that might lead to the discovery of the pitchblende.

Most ratemeter readings over the various lithologic types of the Birch Creek schist ranged between 5 and 7 scale divisions (2.0 range) or approximately 0.001 percent or less equivalent uranium. Readings over the granitic rocks in the Wilson Creek area ranged from 13 to 18 scale divisions (2.0 range) and were the highest obtained in the area. The equivalent uranium content of the granitic rocks ranges from 0.001 to 0.005 percent. This radioactivity is assumed to be due to the presence of traces of radioactive elements in the common accessory minerals of the granite.

A zone of limonitic alteration in brecciated schist (sample 3692-L, fig. 2) contains 0.004 percent equivalent uranium. This slightly anomalous radioactivity is most likely due to traces of uranium in the iron oxides. A search was made for other evidence of mineralization, particularly at or near the granite-schist contact, but none was found.

The data on the samples obtained in the Wilson Creek area are given in table 1; the locations of the samples are plotted on figure 2.

My Creek area

General statement

An occurrence of pitchblende in the My Creek area (fig. 3) was reported by Mr. E. D. Manske to the Geological Survey through the Territorial Department of Mines in the latter part of 1948. The original discovery was supposed to have been made by Mr. William Kruhm, former Alaskan prospector, now deceased, in 1904 while he and one other man were prospecting for gold. According to a map and an account of the location left to Manske by Kruhm the deposit is supposed to occur in a vein on the divide between My Creek and Caribou Creek (fig. 3), although Manske stated that the pitchblende vein actually lies in the drainage area of Our Creek (fig. 3) a short distance below the granite-schist contact. According to Manske the presence of pitchblende was substantiated by a report on samples submitted by Kruhm to a commercial assay firm in the States.

Geology

Reconnaissance geologic mapping in the My Creek area (fig. 3) was done by Prindle (1913, pl. 2) in the course of his studies in the Circle quadrangle. The bedrock consists of the pre-Cambrian Birch Creek schist and granitic intrusives of Mesozoic(?) age. In general, the geology is very similar to that of the Wilson Creek area, described above.

Table 1.--Data on samples collected in the Wilson Creek area.

Sample no.	Description and location	eU 1/ (percent)	Ratemeter reading 2/
3692-L	Iron-stained zone in contorted brecciated schist; on divide between Wilson and Buckskin Creeks about 4-1/2 miles east of Monument Peak	0.004	10
3693-L	Granitic dike in schist; on divide between Wilson and Buckskin Creeks about 5-1/2 miles east of Monument Peak	.003	13
3694a-L	Granite; at summit of Monument Peak	.005	15
3694b-L	Pegmatitic(?) facies of granite; same location as 3694a-L	.001	15 3/
3695-L	Granite; from spur of Monument Peak about 1/2 mile northeast of summit	.005	18

1/ Equivalent uranium as determined in the laboratory

2/ In scale divisions on 2.0 range

3/ High reading probably due to adjacent granite

Some of the quartz veins in the My Creek area are as much as several feet thick and normally are highly fractured and stained with hematite. One quartz vein observed was on the "Ruby-silver claim" (sample locality 3707-L, fig. 3), which, in addition to quartz and hematite, also contains pods of galena, partly altered to cerussite, and calcite. The occurrence of pyrargyrite (ruby silver) in this vein is doubtful. It is possible that the prospectors staking the claim mistook the earthy red hematite for ruby silver. Manske also reports that he had prospected a stibnite deposit on the divide between My Creek and Our Creek several miles west of the "Ruby silver claim".

Radioactivity studies

About 18 miles of radioactivity traverse were made on foot in the My Creek area (fig. 3) in an attempt to locate anomalous radiation that would lead to the discovery of the pitchblende-bearing vein reported by Manske. Manske accompanied the party in the reconnaissance on Our Creek (fig. 3). No significant radiation was detected in the course of the traversing, nor did tests of concentrates (samples 3699 and 3704, fig. 3) from gravels on Our and My Creeks show any radioactivity or mineral content that would suggest the occurrence of a high-grade uranium deposit in the watersheds of the streams above the point of the sampling. The hematitically-stained quartz veins, one of which also contains lead minerals, showed no radioactivity. The maximum radioactivity, (10 scale divisions on the 2.0 range and 0.003 percent equivalent uranium) found in the area was in the coarse-grained granite at the head of Our Creek (sample locality 3706-L, fig. 3). This slight amount of radioactivity is believed to be due to traces of uranium and thorium commonly found in the accessory minerals of felsic

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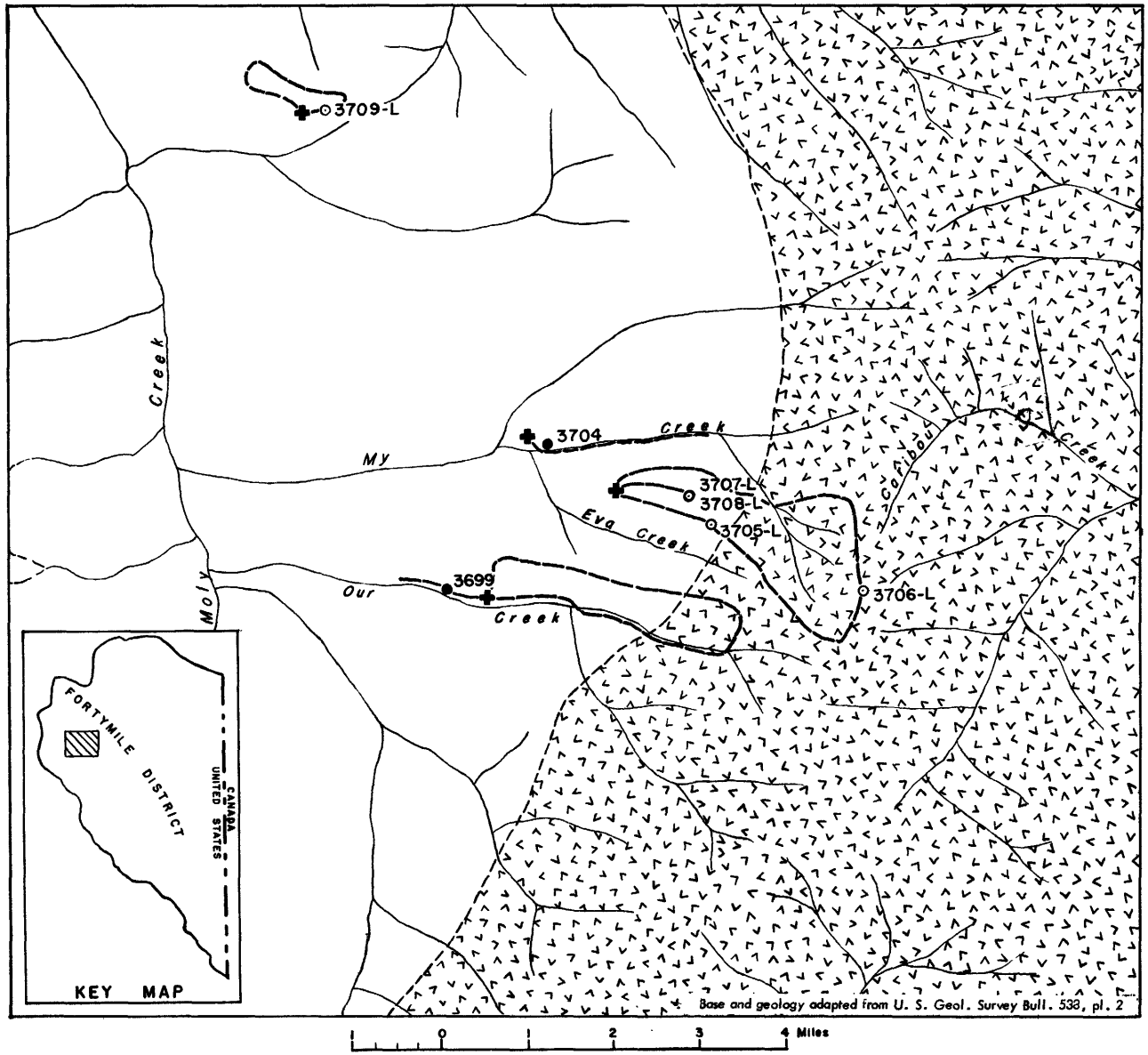
FIGURE 3



EXPLANATION

Granite

Birch Creek schist

Radioactivity traverse

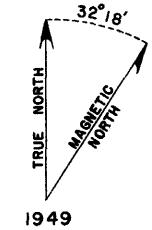
Helicopter landing

⊙-3699-L

Sample location

●-3704

Stream concentrate



GEOLOGIC SKETCH MAP OF THE MY CREEK AREA FORTYMILE DISTRICT, ALASKA

igneous rocks. A large hematitically-altered area of schist on the north side of the first stream north of My Creek (sample locality 3709-L, fig. 3) was also slightly radioactive. The maximum radioactivity detected at this locality was 9 scale divisions on the 2.0 range. A sample of this altered rock contains 0.002 percent equivalent uranium.

The data on the samples collected in the My Creek area are listed in table 2; the locations of the samples are shown on figure 3.

Ben Creek area

General statement

The occurrence of a "yellowish uranium ore" on one of the branches of the first south-flowing tributary of Ben Creek (fig. 4) in the northwestern part of the Fortymile district was reported by Mr. William Ott of Fairbanks to the Geological Survey through the Territorial Department of Mines in 1948. A sample collected by Ott in 1918 was supposedly assayed by a laboratory at Seattle, Washington, and was reported to have a "high content of uranium". However, no records are available for checking, because the laboratory went out of business about 1923-24.

Geology

The geology of the Ben Creek area (fig. 4) was mapped by Prindle (1913, pl. 2) in his studies of the Circle quadrangle. The rocks consist of pre-Middle Ordovician sedimentary rocks, chiefly clastic in type, intruded by granite of Mesozoic(?) age. An area of porphyritic rhyolite between Green Creek and Ruby

Table 2.--Data on samples collected in the My Creek area

Sample no.	Description and location	eU 1/ (percent)	Ratemeter reading 2/
3699	Heavy-mineral fraction 3/ of panned concentrate of 50 pounds of gravel; from dump of old placer-gold prospect pit on Our Creek	0.002	--
3704	Heavy-mineral fraction 3/ of panned concentrate of 50 pounds of gravel; from dump of old placer-gold prospect pit on My Creek at mouth of Eva Creek	.001	--
3705-L	Massive shattered quartz vein with hematitic staining along fractures; on ridge between My and Eva Creeks	<.001	6
3706-L	Coarse-grained granite; on divide at head of My and Our Creeks	.003	10
3707-L	Quartz vein containing galena and hematite with some limonite and cerussite, also some calcite in the gangue; "Ruby silver claim" on ridge between My and Eva Creeks	<.001	6
3708-L	Iron-stained (gossan) rock with a few fragments of galena; same location as 3707-L	<.001	6
3709-L	Hematitically-altered quartz-mica schist with scattered quartz veinlets; on ridge on north side of first stream north of My Creek	.002	9

1/ Equivalent uranium
2/ In scale divisions on 2.0 range
3/ Greater than 2.8 specific gravity

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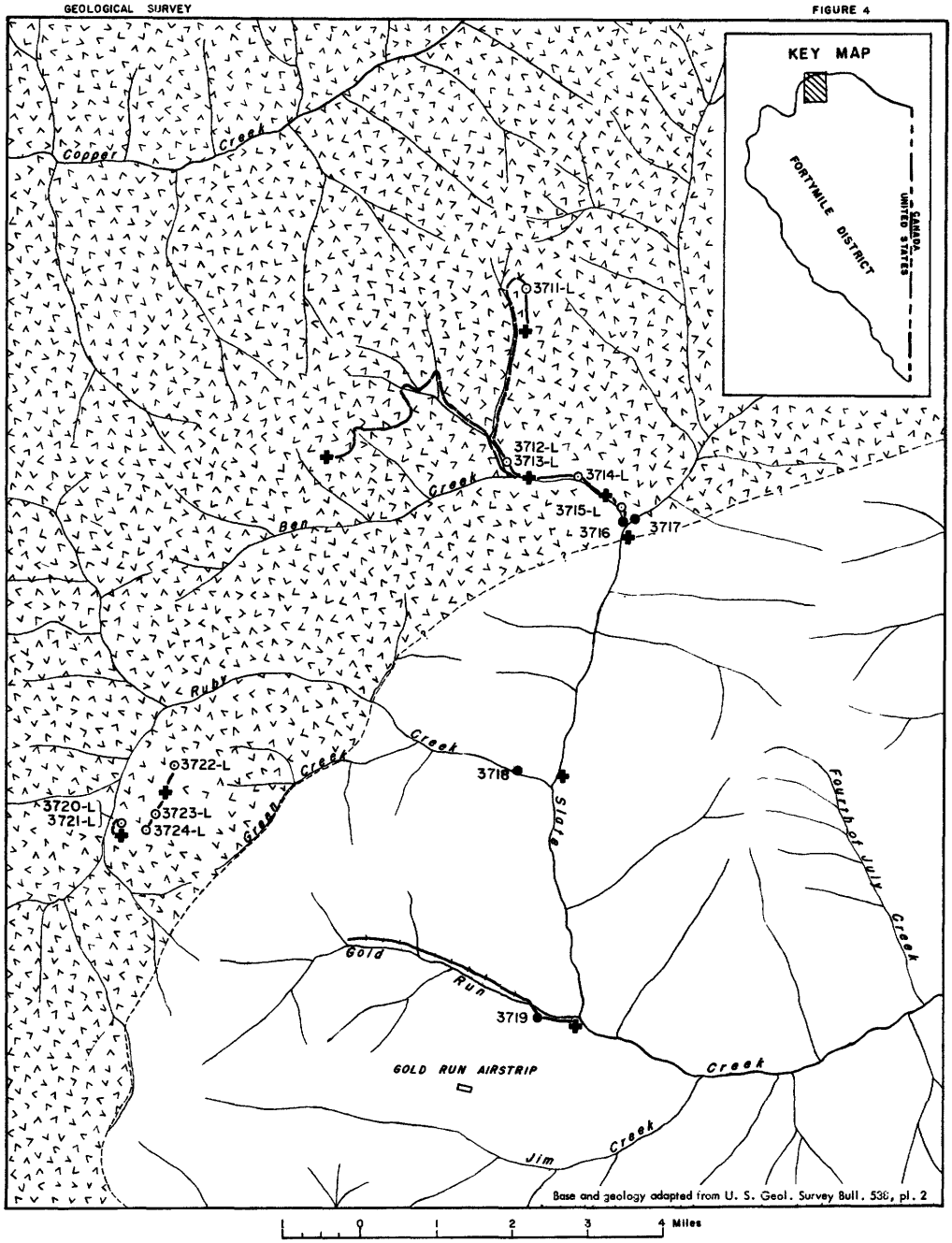
FIGURE 4



EXPLANATION

Granite

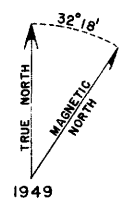
Undifferentiated pre-Middle Ordovician rocks

Radioactivity traverse

Helicopter landing

⊙-3711-L
Sample location

●-3716
Stream concentrate



GEOLOGIC SKETCH MAP OF THE BEN CREEK AREA FORTYMILE DISTRICT, ALASKA

Creek shown on figure 4 as part of the granite may be a border phase of the granite. On the other hand, it may well be one of the Tertiary rhyolites described by Mertie (Prindle, 1913, p. 44, 45), although sufficient evidence is not available to substantiate this possibility.

Little is known of the possibilities for mineral deposits in the area. Gold Run in the southern part of the area (fig. 4) was mined for placer gold in the early part of the century. Ott reports, also, that large fragments of vein float containing galena occur in the gravel at the mouth of Fourth of July Creek (fig. 4). A small copper prospect (Wedow and Tolbert, 1952) is located on Copper Creek about 22 miles northwest of the mouth of Ben Creek.

Radioactivity studies

Between 6 and 7 miles of radioactivity traversing was done in the Ben Creek drainage basin in the vicinity of the "yellowish uranium ore" occurrence reported by Ott. No anomalous radioactivity was found beyond that which normally occurs in most felsic igneous rocks. Ratemeter readings for the most part were constant at about 9 scale divisions on the 2.0 range. These readings increased to 10 and 11 scale divisions toward the contact of the granite with the sedimentary rocks in the part of the traverse to the mouth of Ben Creek. Selected samples (nos. 3711-L to 3714-L, fig. 4) of the granite contain from 0.002 to 0.004 percent equivalent uranium. In addition to the radioactivity traverses on the ground the area was searched closely from the air with the helicopter for the highly colored zones indicative of possible mineralization; none were found in the Ben Creek drainage area or in the Slate Creek drainage area above the mouth of Ben Creek. Southwest of the Ben Creek drainage, however, a large orange-colored hill between Green Creek and Ruby Creek was prominent and

showed a slightly greater radioactivity than surrounding rocks when tested from the air. The rock in this hill is a porphyritic rhyolite varying in color from yellow through orange and red to purple. Ground traversing over the rhyolite showed ratemeter readings of 14 to 18 scale divisions on the 2.0 range; samples (nos. 3720-L to 3724-L, fig. 4 and table 3) of the rhyolite contain 0.005 percent equivalent uranium. In contrast to the granite and rhyolite, ratemeter readings over the clastic sedimentary rocks on a traverse along the lower part of Gold Run (fig. 4) showed only 4 to 6 scale divisions on the 2.0 range. These readings indicate an equivalent uranium content of less than 0.001 percent for the rocks along the traverse. The radioactivity data on samples taken in the Ben Creek area are given in table 3. The locations of the samples are plotted on figure 4.

As a check on the possible radioactive minerals in the granitic rocks, concentrates were taken from the stream gravels at the mouth of Ben Creek, on Slate Creek just above the mouth of Ben Creek, at the mouth of Ruby Creek, and on Gold Run (samples 3716-3719, fig. 4). The data on the radioactivity of these concentrates are given in table 3. Monazite and allanite are present in the concentrates from Ben, Slate, and Ruby Creeks, hence the radioactivity is assumed to be due chiefly to thorium. Although the granite samples were not examined specifically for the presence of the monazite and allanite, their presence in the concentrates from gravels of streams with drainage basins entirely within the granite suggests that they probably occur as accessory minerals in the granite. Supporting this hypothesis is the fact that the concentrate from Gold Run, which does not drain any area of granitic rock, is not appreciably radioactive and does not contain either allanite or monazite.

Table 3.--Data on samples collected in the Ben Creek area

Sample no.	Description and location	eU 1/ (percent)	Ratemeter reading 2/
3711-L	Medium- to coarse-grained granite; on divide between Ben Creek and Slate Creek drainage	0.002	9
3712-L	Coarse-grained (pegmatitic facies?) of granite, in large stream boulder; from tributary of Ben Creek about 1/4 mile above mouth	.004	--
3713-L	Medium- to coarse-grained granite bedrock (weathered); same location as 3712-L	.002	9
3714-L	Medium- to coarse-grained granite on left limit of Ben Creek about 1 mile above mouth	.003	10
3715-L	Medium- to coarse-grained granite on left limit of Ben Creek about 100 yards above mouth	.003	11
3716	Heavy-mineral fraction 3/ of panned concentrate from about 100 pounds of stream gravel; on Ben Creek about 250 feet above mouth	.096	--
3717	Heavy-mineral fraction 3/ of panned concentrate from about 100 pounds of stream gravel; on Slate Creek about 500 feet above mouth	.068	--
3718	Heavy-mineral fraction 3/ of panned concentrate from about 75 pounds of stream gravel; on Ruby Creek about 1/2 mile above mouth	.015	--
3719	Heavy-mineral fraction 3/ of panned concentrate from about 100 pounds of stream gravel; on Gold Run about 1/2 mile above mouth	.003	--

1/ Equivalent uranium
2/ In scale divisions on 2.0 range
3/ Greater than 2.8 specific gravity

Table 3.--Data on samples collected in the Ben Creek area--Continued

Sample no.	Description and location	eU 1/ (percent)	Ratemeter reading 2/
3720-L	Hematite- and limonite-stained porphyritic rhyolite of granite; on west flank of large "orange hill" between Ruby and Green Creeks	0.005	18
3721-L	Orange-colored residuum from rhyolite; same location as 3720-L	.005	18
3722-L	Purplish-colored rhyolite; about 1 mile northeast of 3720-L	.005	14
3723-L	Iron-stained rhyolite; about 1/4 mile northeast of summit of "orange hill"	.005	14
3724-L	Same as 3723-L; at summit of "orange hill"	.005	14

1/ Equivalent uranium
2/ In scale divisions as 2.0 range

Chicken and vicinity

As time permitted from the reconnaissance investigations discussed in the previous pages, a few radioactivity tests were made in the vicinity of Chicken. (See inset, fig. 1.) In addition, a few slightly radioactive samples were donated to the Geological Survey by prospectors. The data on the samples obtained in the vicinity of Chicken are listed in table 4; the locations of the samples are plotted on the inset of figure 1.

The radioactive sluice-box concentrate from the placer-gold operation on Atwater Bar is comparable to similar concentrates from Atwater Bar described by White (1950, p. 3-6). The chief radioactive minerals are uranothorianite and monazite. Although time did not permit a search for the bedrock source of the uranothorianite, the brittle nature of this mineral, and hence its tendency to shatter when transported, suggests that the source is not far distant.

Prindle (1909, p. 24 and pl. 2) describes and maps a small area of Tertiary coal-bearing sedimentary rocks in the vicinity of Chicken. The samples of montmorillonite-type clay from Shaw's claim on the first creek west of Chicken Creek (table 4) most likely were collected from a bed in the Tertiary sequence. The samples contain 0.001-0.005 percent equivalent uranium and consist mostly of clay with some sand-size particles and a minor amount of coarser material. The coarser material is chiefly in the form of rounded pellets. The entire material of the samples, however, is much too distintegrated to determine whether the original rock was igneous or sedimentary in origin. A few of the pellets contain small crystals of pyrite partly altered to hematite and limonite. The heavy-mineral fraction greater than 2.8 specific gravity of

Table 4.--Data on samples from Chicken and vicinity, 1949

Sample no.	Description and location	eU 1/ (percent)	Ratemeter reading 2/
3689	Sluice-box concentrate from placer-gold operations at Atwater Bar; donated by Lon L. Davis	0.027	--
3690	Same as sample 3689	.003	--
3697-L	Coarse-grained granitic rock; in barrow pit along Taylor Highway about 4 miles southwest of Mosquito Fork bridge	.002	7-8
3698-L	Mafic dike about 6 feet thick cutting granitic rock at locality of sample 3697-L	.002	7-8
3700-L	Montmorillonite-type clay from Howard Shaw's claim on first creek west of Chicken Creek; donated by Shaw	.003	--
3701-L	Same as sample 3700-L	.005	--
3702-L	Same as sample 3700-L; hard pallets in clay-- appear to be sulfide bearing	.004	--
3703-L	Same as sample 3700-L; mostly clay	.001	--
S-256	Ash bed from burned coal; about 1/2 mile northwest of Chicken	.003	11
S-257	Coked(?) coal; same location as sample S-256	.002	10
S-258	Burned clay; same location as sample S-256	.001	10
S-259	Coked(?) coal; same location as sample S-256	.002	10

1/ Equivalent uranium
2/ In scale divisions on 2.0 range

sample 3701-L contains as much as about 0.06 percent equivalent uranium. It consists of about 99 percent pyrite with traces of hematite, goethite, covellite, chalcopyrite, biotite, and chlorite. The radioactivity is probably due to uranium occurring as an impurity in the iron oxides.

The coked(?) coal and related ash beds containing as much as 0.003 percent equivalent uranium collected near Chicken are also part of the Tertiary sedimentary rocks mapped by Prindle (1909, pl. 2). The proximity of a body of basalt to the coal and the fact that much of the coal now exposed was coked rather than completely burned suggests that the coking and burning accompanied the emplacement of the basaltic rocks. The slightly anomalous radioactivity of the coal and ash beds is probably due to the concentration of traces of radioactive elements in the process of coking and burning.

SUMMARY AND CONCLUSIONS

Three occurrences of high-grade uranium ores reported by prospectors in the Fortymile district were sought but not found. The maximum radioactivity detected was in felsic igneous rocks, which contain as much as 0.005 percent equivalent uranium. Concentrates from gravels of creeks draining areas underlain by the felsic igneous rocks contain as much as 0.096 percent equivalent uranium. This radioactivity is assumed to be due chiefly to thorium in allanite and monazite. A summary of the materials tested in the Fortymile district is given in table 5.

Although the search for high-grade uranium deposits in the Fortymile district in 1949 was unsuccessful, the district cannot be arbitrarily dismissed as having no potential for radioactive minerals. It is significant to note that small amounts of uranium occur in a copper deposit on Copper Creek (Wedow and Tolbert, 1952) a short distance

Table 5.--Summary of data on radioactivity of materials tested in the Fortymile district, 1949

Type of material tested Location	Equivalent uranium (percent)
Granitic rocks	
Wilson Creek area	0.003-0.005
My Creek area	.003
Ben Creek area	.002- .004
Vicinity of Chicken	.002
Porphyritic rhyolite	
Ben Creek area	.005
Mafic dike	
Vicinity of Chicken	.002
Mineralized quartz veins	
My Creek area	.001
Hematitically-altered or iron-stained schist	
Wilson Creek area	.004
My Creek area	.002
Sulfide-bearing clay	
Vicinity of Chicken	.001- .005
Coked(?) coal and ash beds from burned coal	
Vicinity of Chicken	.001- .003
Concentrates from placers	
My Creek area	.001- .002
Ben Creek area	.003- .096
Vicinity of Chicken	.003- .027

northwest of the district, and traces of uranothorianite are found in the placers of Atwater Bar near Chicken. In addition, occurrences of fluorite (Wedow and others, 1953, p. 13) and metallic minerals (Mertie, 1937, p. 244, 245), commonly associated elsewhere with uranium, are known in the district. At present, however, too little geologic information is available to suggest specific localities for uranium prospecting.

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