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UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Technical Letter
Saudi Arabian Mineral
Exploration 36
Prepared November 10, 1965
Issued December 28, 1965

Dr. Fadil K. Kabbani
Deputy Minister for Mineral Resources
Directorate General for Mineral Resources
Ministry of Petroleum and Mineral Resources
Jiddah, Saudi Arabia

Dear Dr. Kabbani:

Transmitted herewith are 10 copies of:

TECHNICAL

TECHNICAL LETTER NUMBER 36
REPORT ON A FIELD TRIP TO THE JABAL
AS SAWRAH AND WADI AL 'AYS AREAS, NORTHWESTERN
HIJAZ QUADRANGLE, SAUDI ARABIA

by

Robert F. Johnson* and Virgil A. Trent*

Sincerely,

Glen F. Brown
Glen F. Brown, Chief
Saudi Arabian Mineral Exploration Project

* U. S. Geological Survey, Jiddah, Saudi Arabia

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Robert F. Johnson* and Virgil A. Trent*

Introduction

The fifth field trip into the Northwestern Hijaz quadrangle was made during the period October 5 to November 8, 1965. The objectives of the fifth field trip into quadrangle I-204 were to complete the mineral reconnaissance in the area between parallels $25^{\circ}30'$ and $26^{\circ}30'N.$ and meridians $38^{\circ}30'$ and $39^{\circ}E.$; to complete the reconnaissance in the Wadi Al'Ays area east of the ultrabasic rocks; and to check the areas mapped as ultrabasic rock on sheet I-204 in the area northeast of Umm Lajj.

The results were disappointing in that no surface indications of mineralized areas were seen. It is hoped that trace element analyses of samples of wadi sediment will indicate areas with above-average metal content.

The itinerary of the trip was to follow the Khaybar-Al 'Ula road into the area from the paved highway. Three northwest traverses were made in the area mapped east of the railroad and side traverses were made into most of the larger wadis. Travel was facilitated by the presence of three subparallel northwest-trending valleys. The western-most of these is followed by the railroad. We worked south along the railroad, crossed Wadi Al Hamd and continued south along Wadi At Tura'ah. We crossed the divide at the head of the wadi and continued south to Murayjib gold mine where we got on the old SAMS road which we followed to Wadi Al Far'ah. We went to Yanbu al Bahr for gasoline then returned to Wadi Al 'Ays where we finished our

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reconnaissance of the large ultrabasic area. Trent had to return to Jiddah and Johnson continued north to Wadi Al Hamd to examine Jabal Dhulay'ah. From there the field party went northwest up Wadi Batha' and south to Aqla, a well on the edge of Wadi Al Hamd. We continued westward parallel to Wadi Al Hamd and crossed it at an easy crossing along the north trending fault near the mouth of Wadi Madhar. We followed the fault southward to the Hamim and Al Buhayr gold mines. From there we threaded our way through the wadis examining the rocks mapped as ultrabasic. We came out of the mountains at the Al'Uwaynid gold mine in a heavy rainstorm. From Umm Lajj we took the interior road back to Yanbu with a detour up Wadi Kamal to the margin of the Jabal Radwa granite.

At the time of the first plane rendezvous at Jabal As Sawrah a trip was made in the Beaver to the north end of the quadrangle at meridian 37°E . to examine an area of white rocks under a basalt flow that resembled lateritic clay or bauxite. The deposit turned out to be a white siliceous shale of no apparent commercial value. Samples of the shale and its weathering product, a fine fluffy powder, were brought in for analysis.

Geological results

One of the reasons for examining the area between $25^{\circ}30'$ and $26^{\circ}30'\text{N}$.; $38^{\circ}30'$ to 39°E . was the abundance of gp type intrusives shown on the geologic map, I-204A (Brown and others, 1963). Dr. Glen F. Brown had asked that these be examined as not much field checking had been possible during the compilation of the geology. We found that all but two of the areas mapped as gp are intrusive rocks but that they do not correspond to the description of gp given in the legend of I-204. All are granitic rocks with alaskite, biotite granite, and hornblende granite predominating. One intrusion is a porphyritic granite with phenocrysts of potash feldspar averaging about 1 cm. across.

Another problem that was studied but not completely resolved is the metamorphic grade of rocks in the area mapped as Hadiyah formation that extends northwest from the railroad near Al Mudarrajj station. The western end of this belt was found to be gneiss by Brown and Schurmann (Brown, oral communication, 1965). A traverse along the belt showed that the metamorphic grade decreased to the southeast. The gneiss is confined to the northwest end of the belt whereas the central portion of the belt is

made up of brown-weathering micaceous and chloritic schist. The thick section of schist could be metamorphosed Hadiyah formation. The southern portion of the belt south of the northwest-trending fault shown on map I-204A is largely Halaban andesite rather than Hadiyah formation. Definite Hadiyah formation extends west from Hadiyah station and south of the mountain front.

The large area of rocks mapped as Sc in Wadi Al 'Ays and Wadi Tura'ah are either Hadiyah formation or Halaban andesite slightly metamorphosed but only locally schistose. We plan to show the rocks as either h or ha on our maps wherever possible and not to use the symbol sc in this area. We would limit the use of the symbol sc to schist and gneiss the origin of which is not known.

The rocks mapped as ub? on Jabal Dhulay'ah at the junction of Wadi Al Jizl and Wadi Al Hamd were found to be Halaban andesite with some interbedded clastic material and a bed of black fetid marble.

The rocks mapped as ultrabasic northeast of Umm Lajj and south of the Hamim - Al Buhayr mines are amphibolite - diorite - granodiorite complexes that may be partly digested roof pendants in the granodiorite batholith that underlies the area. The only exception is the small body farthest to the northeast. This is a small imperfectly developed ring structure with fresh gabbro and weathered biotite-rich mafic rock.

Mineral deposits

The economic mineral potential of the area examined seems very low. Other than the ancient gold mines and a few traces of chromite and copper in the ultrabasic rocks west of Wadi Al 'Ays, surface indications of metallic minerals were not seen. The talc schist in Wadi Muraykhat northeast of Umm Lajj, that was used for pottery by the ancients, appears to be too highly sheared and impure in most places for industrial use or cosmetics. R. G. Bogue (written communication) saw these deposits in 1953 and reached a similar conclusion.

The wadi sediment samples taken from granite contacts, fault zones and altered areas have not yet been analyzed; we hope that some areas with anomalous mineral content may yet be indicated.

References

Brown, G.F., Jackson, R. O., Bogue, R. G. and Elberg, E. L., Jr., 1963, Geologic map of the Northwestern Hijaz Quadrangle, Kingdom of Saudi Arabia: U. S. Geol. Survey Misc. Geol. Inv. Map I-204A.

References

Brown, G.F., Jackson, R. O., Bogue, R. G. and Elberg, E. L., Jr., 1963, Geologic map of the Northwestern Hijaz Quadrangle, Kingdom of Saudi Arabia: U. S. Geol. Survey Misc. Geol. Inv. Map I-204A.