مصلحة المساحة الجيولوجية الأمريكية
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وزارة المالية والاقتصاد الوطني
المديرية العامة للبترول والمعادن
KINGDOM OF SAUDI ARABIA
MINISTRY OF FINANCE AND NATIONAL ECONOMY
DIRECTORATE GENERAL OF PETROLEUM AND MINERAL AFFAIRS

GEOLOGY OF THE TIHAMAT ASH SHAM QUADRANGLE, KINGDOM OF SAUDI ARABIA

By
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خريطة جيولوجية للوجه تهامة الشام بالمملكة العربية السعودية

وضع
السيدين جلين براون و روي جاكسون

أبحاث جيولوجية مختلفة
خريطة رقم I-٢١٦ A
MISCELLANEOUS GEOLOGIC INVESTIGATIONS
MAP I-216 A

GEOLOGIC EXPLANATION — القسم الجيولوجي

QUATERNARY

Gravel, sand, silt, and clay, undifferentiated — Qu
In fan and terrace deposits and on coastal salt mud flats; includes slightly elevated coral reefs

Basalt — Qb
Olivine basalt, slightly eroded cinder cones and lava fields

TERTIARY — Miocene and Pliocene

Basalt — Tb
Olivine basalt; eroded and dissected

Andesite and diabase — Ta
Hypabyssal igneous complex of glomeroporphyritic and porphyritic andesite, diabase, felsite, aplite, and olivine basalt; includes sepia and sevenna of older rocks, mostly gabbro

Baid formation — Tba
Gray, red, and green siliceous and tuffaceous shale, and brecciated limestone

NONCONFORMITY(?)

PRE-PERMIAN

Dikes of rhyolite, diabase, and andesite
Includes some aplite, pegmatite, and gabbro

Albite-muscovite granite — ag
Coarse-grained with much simple pegmatite; surrounded by halos of biotite and garnet-bearing rocks

Granite and syenite — gr sy
Granite, pink, gr, includes calc- and per-alkalic facies, seldom metamorphosed, locally porphyritic with phenocrysts of microcline. Generally includes quartz veins and aplite or pegmatite dikes. Syenite, sy, dark- to light-gray, unmetamorphosed; nordmarkite type in part

Granite — gr
Gray or pink calc-alkalic rock, generally non lineated; tends to be porphyritic with large microcline or orthoclase crystals especially in border facies; quartz commonly has bluish cast; pegmatite, quartz veins, and aplite rare; may include some per-alkalic granite (gp)

Diorite, gabbro, amphibolite, and green schist complex — dc
Brecciated, intruded and metamorphosed by younger granite; complex structure due in part to movements within rift zone

Quartz diorite — qd
Gray, biotite-rich, feldspars somewhat saussuritized

Granite and granodiorite — gg
Gray, gneissic, often sheared with strained quartz, includes simple pegmatites, and diabase and other dike rocks

Diorite and gabbro — d gb
Gray and pinkish gray diorite, d, biotite and antigorthite common, generally of hybrid type; gabbro and other related basic igneous rocks, gb; probably includes basic igneous rocks younger than gg

Diorite and granodiorite — dg
Dark-gray complex, mostly diorite and granodiorite, considerably metamorphosed and brecciated; minor granite and aplite dikes and sills

Mctadiorite — md
Biotite-rich, generally low quartz tonalite-like hybrid rocks, banded gray and pinkish gray. Includes other metamorphosed basic igneous rocks and some paraschists; generally altered and disturbed by later dinstrophism

Greenstone, amphibolitized greenstone, and schistose greenstone — g gs gs
Greenstone derived from basic fine-grained igneous rocks, g, with local pillow lava structure; includes some massive beds of metadiorite, minor phyllite and slate, and small granitic intrusives. Amphibolitized greenstone, gs, includes quartz, aplite, granite, and pegmatite dikes, sills, or irregular masses; schistose greenstone, gs

Chlorite and sericite schist — sc
Locally carbonaceous, calcareous, and quartzose; largely of sedimentary origin

Marble and quartzite — mq
Tan, gray, and purple; includes minor, tan to purple schist and phyllite

Quartz-feldspar schist — qs
Some mylonite, derived in part from intermediate igneous rocks

Trend lines
Showing lineation in basement rocks

Geologic contact
Dashed where approximately located; short dashed where indefinite

Fault or shear zone
Dashed where approximately located

Anticline

Syncline

MAP LEGEND

POPULATED PLACES
- Town
- Village
- Village, name not given
- Ruins
- Areas under cultivation

TRANSPORTATION
- Major road
- Secondary road
- Road of questionable permanency
- Camel trail

HYDROGRAPHIC FEATURES
Only isolated wells are shown
- Dug well
- Drilled water well
- Intermittent stream
- Reef

HYPSOGRAPHIC FEATURES
- Generalized relief
- Sand
  Dense stipple represents mobile sand cover consisting primarily of dunes, linear ridges, and other individual sand forms, that are shown where map scale permits; moderately dense stipple represents more stabilized continuous sand cover; open stipple represents discontinuous sand cover

Types of sand terrain
- I Transverse. *Predominantly simple and compound barchan dunes in areas of more mobile sand, and/or simple rounded ridges, both oriented transverse to the prevailing wind direction*
- II Longitudinal. *Primarily dikdikah and various types of undulating sand sheets, in general characterized by elongation of the individual topographic forms parallel to the prevailing wind direction, often partially stabilized by sparse vegetation*
- III 'Urūq. *Various forms of long, nearly parallel, sharp crested narrow sand ridges and dune chains separated by broad sand valleys usually including elements of type I sand terrain. These are the resultant of a system of two dominant wind directions and are identical to the sayf dunes of North Africa*
- IV "Sand mountains." *Dominated by large sand massifs commonly creating 50 to 200 meters above the substratum, often with superimposed dune patterns consisting of various types of complex barchans. Common forms are giant barchans spanning several kilometers from horn to horn; giant bisinodal and pyramidal sand peaks as well as other less common peak forms; and giant oval to elongate sand mounds*

MISCELLANEOUS FEATURES
- Spot elevation in meters
  Elevations on top of escarpment after W. Thesiger
- Bathymetric contour, in meters
- Mine

GLOSSARY — المصطلحات

عين	'Ayn	Spring, solution pit, or well
بئر	Bi'r	Dug well
دكاكة	Dikakah (t)	Eolian sand terrain dominated by hummocks accumulated about small bushes and grass clumps
حرة	Ḥarrah (t)	Fields of lava and volcanic ejecta
حصن	Ḥiṣn	Fort
جبل ج جبال	Jabal; pl., Jibāl	Hill or mountain
جزيرة	Jazā'ir	Islands
رأس	Ra's	Cape
سهل	Sahl	Plain
سوق	Sūq	Market place
وادي	Wādī	Valley or dry water course

SOURCES OF BASE COMPILATION — مصادر الخرائط الأساسية

A, compilation from vertical photography, 1951-1953; B, compilation from trimetrogon photography, 1944 and 1945; and C, offshore detail modified from U. S. Navy H. O. Chart No. 2814, 5th edition, August 1950, and H. O. Chart No. 2815, 8th edition, July 1938. Topographic representation by the Topographic Division, U. S. Geological Survey.

Geologic mapping based on field survey supplemented by photo interpretation by G. F. Brown and R. O. Jackson, U. S. Geological Survey, 1951-56.

This map printed in two sheets: Sheet A, geology and geography combined; Sheet B, geography only. Analysis compiled at the Directorate General of Petroleum and Mineral Affairs, Ministry of Finance and National Economy, Jiddah and Ad Dammām, Saudi Arabia, and at the U. S. Geological Survey, Washington, D. C., U. S. A.

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Lambert conformal conic projection; standard parallels 17° and 33°

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10 0 10 20 30 40 50 Kilometers
10 0 10 20 30 Miles

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INDEX MAP OF ARABIAN PENINSULA
Maps published by the U. S. Geological Survey shown by asterisk following name.

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