وزارة الداخلية
مصلحة المساحة الجيولوجية الأمريكية
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

المملكة العربية السعودية
وزارة البترول والثروة المعدنية
KINGDOM OF SAUDI ARABIA
MINISTRY OF PETROLEUM AND MINERAL RESOURCES

أبحاث جيولوجية مختلفة
خريطة رقم A ٢١١-I
MISCELLANEOUS GEOLOGIC INVESTIGATIONS
MAP I-211A

M(500)

GEOLOGIC EXPLANATION

التقسيم الجيولوجي

QUATERNARY

Qes — **Eolian sand**
Mostly mobile

Qs, Qgp, Qu — **Silt and gravel**
Silt and associated fine sediments, including caliche-like deposits in undrained depressions, locally interbedded with gravel, Qs. Sheet-like lag gravel deposits of quartz and other pebbles from the basement complex; darker rocks predominate, Qgp. Unconsolidated surficial deposits of silt, sand and gravel; may include unrecognized equivalents of other units of Quaternary age, Qu

Qsb — **Sabkhah and khabra deposits**
Silt, clay, and muddy sand; commonly saline

Qt — **Terrace sand and gravel**
Sheet-like lag deposits of quartz and other pebbles from the basement complex, dissected and not obviously connected to present drainage

TERTIARY

Tlb — **Lake beds**
Lacustrine, tufa-like limestone and chalcedony

Tb — **Basalt**
Mostly olivine-rich, titaniferous basalt; includes some rhyolite, andesite, and related pyroclastic rocks

PERMIAN

Pk — **Khuff limestone**
Light-colored limestone, interbedded argillaceous limestone, dolomite, marl, and gypsiferous clay; a varicolored sandstone and shale unit usually present at base. Exposures are poor; most of formation probably shale and marl within quadrangle

DISCONFORMITY

Pw — **Wajid sandstone**
Purple, reddish-brown, yellow, tan, and white massive and cross-bedded sandstone of Nubian type. Locally includes brick-red, brown, and yellow layers of dense, platy limonite and hematite-cemented concretions; thin conglomerate lenses composed of poorly to well-rounded quartz pebbles and boulders; minor amounts of white, tan, and cream, fine-grained, platy dolomite and dense limestone

UNCONFORMITY

Dikes of rhyolite, diabase, and andesite
Of diverse ages?

PRECAMBRIAN

gp — **Granite**
Red and pink unmetamorphosed alkalic to peralkalic granite. Generally in circular plugs and stocks. Age 550-590 million years from Rb/Sr isotope ratios

fm — **Farida marble**
Brown, tan, dark blue, and black marble; detrital, crossbedded, locally cherty in lower part; commonly sheared, folded, and thrust. About 150 meters thick; generally occurs thrust over and along wrench-fault zones

UNCONFORMITY

gm — **Granite**
Red and gray alkalic granite; commonly sheared, and gneissic

mu — **Murdama formation**
Coarse basal conglomerate, quartzite, phyllite, siliceous slate and graywacke; locally crossbedded, sheared, gently folded, and unmetamorphosed at the Jabal al Murdamah type locality. Farther south in the vicinity of Jibal ar Raqabah tightly folded, sheared, and metamorphosed; includes interbedded acidic volcanics, in some areas metamorphosed to tuffaceous schists of quartz, sericite, chlorite, and biotite types. Thickness at and near Jabal al Murdamah type locality 6100 meters

hc, ha — **Halaban formation**
Andesite, typically felsitic, agglomerate, conglomerate, quartzite, graywacke; locally interbedded marble and rhyolite; sheared and folded, hc. Discordant andesite, minor acidic extrusives, epidiorite, diorite, diabase, gabbro and serpentinite, ha

UNCONFORMITY

gr — **Granite**
Gray and pink calc-alkalic hornblende granite; generally massive, weathers to bornhardts. Includes some quartz diorite, diorite and epidiorite mapped as qd on adjoining quadrangle. Age 735 million years from Rb/Sr isotope ratios

gn, gg — **Granite and granodiorite**
Gray, generally gneissic, sheared, cave-type, granite; includes intrusions of younger granite dikes and plugs; migmatitic xenoliths, usually amphibolitized, of older rocks are common; southwest of Najd fault zone, gg. Northeast of Najd fault zone, gn. Both granites have similar petrographic and structural relationships but age determinations from Rb/Sr ratios indicate gg to be 1000 M. Y. old and gn somewhat younger

dg — **Diorite and granodiorite**
Often gneissic; contaminated by migmatitic xenolithic metamorphic rocks, usually amphibolite, and younger granites

rs — **Slate**
Red or gray siliceous slate, minor amounts of conglomerate, quartzite, and marble

gd — **Greenstone**
Basic flows metamorphosed to green schist facies; includes minor quartzite and slate

gs — **Chlorite schist**
Greenschist derived mostly from mafic rocks; includes sericite schist, minor amounts of quartzite, and slate

sc — **Sericite and chlorite schist**
Greenschist derived mostly from sedimentary rocks; includes minor amounts of marble, quartzitic stretched conglomerate, abundant quartz dikes and pods, and zones of amphibolite, schistose phyllite, and slaty schist

Trend lines
Showing lineation in basement rocks

Contact
Dashed where approximately located

Thrust fault

Fault

735 — Sample locality for age determination by L. T. Aldrich, Carnegie Institution of Washington

Prepared by the U. S. Geological Survey and the Arabian American Oil Company under the joint sponsorship of the Kingdom of Saudi Arabia and the U. S. Department of State.

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

MAP LEGEND

اصطلاحات الخريطة

POPULATED PLACES
- Town or village
- Village, name not given

TRANSPORTATION
- Major road, unpaved
- Secondary road
- Road of questionable permanency
- Trail
- Landing field

HYDROGRAPHIC FEATURES
Only isolated wells are shown
- Drilled well
- Dug well
- Intermittent stream
- Sabkhah
- Silt flat

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*

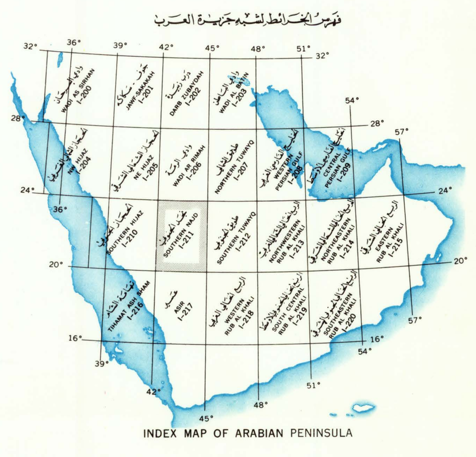
II — Longitudinal. *Primarily dikakah and various types of undulating sand sheets, in general characterized by elongation of the individual topographic forms parallel to the prevailing wind direction, often partially stabilized by sparse vegetation*

III — 'Uruq. *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 cresting 50 to 300 meters above the substratum, often with super-imposed dune patterns consisting of various types of complex barchans. Common forms are giant barchans spanning several kilometers from horn to horn; giant bisigmoidal and pyramidal sand peaks as well as other less common peak forms; and giant oval to elongate sand mounds*

MISCELLANEOUS FEATURES
- Ruins
- Mine, prospect, or ancient workings
- Spot elevation (× 875 meters) — *Uncontrolled altimeter readings*
- Water pipeline

فهرس الخرائط لشبه جزيرة العرب



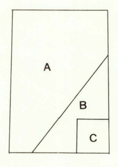
INDEX MAP OF ARABIAN PENINSULA

GLOSSARY

ايضاحات

أبرق ج برقان	Abraq; pl., Burqān	Rocky hill with sands on slopes
بئر	Bi'r	Dug well
برقة	Burqah (t)	Hill, generally rocky, flanked by sand
درب	Darb	Road or trail
فريدة	Farīdah (t)	Hill or mountain detached from main mass; singly, grouped or in linear form
حرة	Ḥarrah (t)	Lava flow and volcanic debris
عرق	'Irq	Long linear sand ridge
جبل ج جبال	Jabal; pl., Jibāl	Hill or mountain
خشم	Khashm	Headland or promontory along a cliff or mountain front
منجم	Manjam	Mine
مشاش	Mishāsh	Shallow hand-dug well
نفود تصغيره نفيد	Nafūd; diminutive, Nufayyid	Large area of sand dunes
قوز	Qawz	Sand mounds or hummocks accumulated about shrubs
سبخة	Sabkhah	Silt, clay, and salt flats, often with saline incrustations
سهل	Sahl	Plain
شعيب	Sha'īb	Same as wādī
وادي	Wādī	Valley or dry water course

مصادر المجموعات الأساسية



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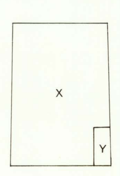
مصادر المجموعات الجيولوجية



Geologic mapping by the U.S. Geological Survey, X, based on field traverses and photo interpretation by Roy O. Jackson, Richard G. Bogue, and Glen F. Brown; and Y, based on field surveys by Ruel D. Gierhart, Arabian American Oil Company, and photo interpretation by Roy O. Jackson, U.S. Geological Survey.
Translation of the geologic explanation edited by Harold W. Glidden, U.S. Department of State.

SOURCES OF GEOLOGIC COMPILATION

This map printed in two sheets; Sheet A, geology and geography combined; Sheet B, geography only. Available at the Ministry of Petroleum and Mineral Resources, Jiddah and Ad Dammām, Saudi Arabia, and at the U.S. Geological Survey, Washington, D. C., U. S. A.

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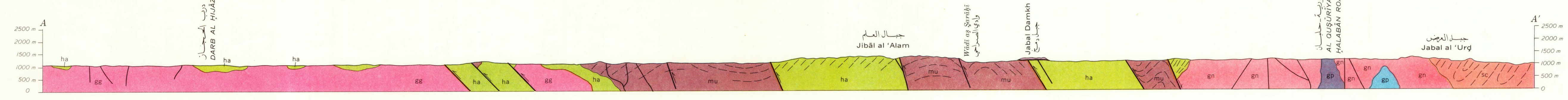

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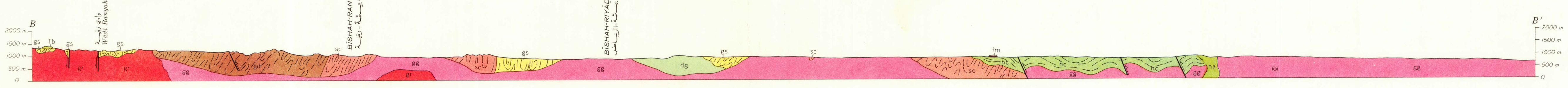

GEOLOGY OF THE SOUTHERN NAJD QUADRANGLE, KINGDOM OF SAUDI ARABIA

By

Roy O. Jackson, Richard G. Bogue, Glen F. Brown and Ruel D. Gierhart

خريطة جيولوجية للوحة نجد الجنوبي بالمملكة العربية السعودية

وضع
روي جاكسون وريتشارد بوغ وجلين براون وروبل جيرهارت

أبحاث جيولوجية مختلفة
خريطة رقم A ٢١١-I
MISCELLANEOUS GEOLOGIC INVESTIGATIONS
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