

**Qes** EOLIAN SAND (QUATERNARY)—Principally quartz sand in semistable dunes in northwest part and along eastern boundary of quadrangle; actively drifting sand on the lee (east) side of Jibal al Misma. Thickness 0 to 100 m

**Qu** UNDIFFERENTIATED ALLUVIUM (QUATERNARY)—Unconsolidated sheetflood and lag gravel with abundant admixtures of windblown sand. Gravel contains angular and subangular pebbles and cobbles of basalt and granitic rocks derived from adjacent and subjacent bedrock. Thickness 0 to 30 m

**Oeru** RAM AND UM SAHM SANDSTONES, UNDIVIDED (ORDOVICIAN AND CAMBRIAN)—Upper part consists of alternating beds of sandstone, siltstone, and mudstone; lower part is nearly entirely sandstone in alternating sets of cross-stratified and flat-stratified beds; entire sequence is probably of beach and marginal-marine origin. Sandstone is fine to coarse grained; brown, pale yellow brown, chocolate brown, and buff; some thin beds with abundant ferruginous and manganiferous(?) cement are nearly black; lower part contains numerous lenses of conglomeratic sandstone containing subrounded and rounded granules, pebbles, and cobbles of white quartz. According to Brown and others (1979), the Ram and Um Sahn sandstones may be equivalent in part to the Saq sandstone (Powers and others, 1966). Thickness 0 to 1,000+ m

**bgr** BIOTITE GRANOPHYRE (PRECAMBRIAN)—Dark-gray, black, and green basalt; mostly dense without phenocrysts; locally, with sparse plagioclase phenocrysts to 6 mm in a dense felsy groundmass composed of plagioclase microlites, green clinopyroxene, and abundant opaque iron oxide

**ha/hat** HADN FORMATION (PRECAMBRIAN)—Gray and dark-gray aphyric basalt or basaltic andesite (ha) interbedded with gray densely welded tuff (hat). The tuff displays small, well-flattened pumice lapilli that are generally darker than the enclosing matrix; in addition, it contains numerous small lithic fragments consisting of basalt and variegated granitic rocks; the granitic rocks consist of subequal plagioclase and alkali feldspar and 20 to 30 percent quartz. The tuff is mostly crystal poor; a single thin section shows less than 5 percent small phenocrysts of alkali feldspar, plagioclase, and quartz. The correlation with the Hادن formation exposed in other quadrangles to the east is tentative and based on the similarity of the welded tuff there exposed

**hu** HULAYFAH GROUP (PRECAMBRIAN)—Dark-gray, black, and green basalt; mostly dense without phenocrysts; locally, with sparse plagioclase phenocrysts to 6 mm in a dense felsy groundmass composed of plagioclase microlites, green clinopyroxene, and abundant opaque iron oxide

**rhy** RHYOLITE DIKES (PRECAMBRIAN)—Mostly alkali rhyolite in dikes as wide as 20 m; red and purple, mostly silicified; phenocrysts of quartz to 8 mm; alkali feldspar to 1 cm; and sodic amphibole as large as 3 x 8 mm in a dense to fine-grained groundmass of quartz and alkali feldspar. The interiors of the dikes are actually fine-grained granite in several localities

**cod** COMENDITE OR SODA RHYOLITE DIKES (PRECAMBRIAN)—Dikes as wide as 10 m composed of light- to medium-gray, slightly porphyritic comendite or soda rhyolite; about 5 percent phenocrysts of alkali feldspar to 5 mm and quartz to 3 mm in a holocrystalline sugary groundmass with an average grain size of less than 0.5 mm. Groundmass consists of about 80 percent alkali feldspar and quartz, 20 percent tiny prisms of highly pleochroic sodic amphibole and tiny rosettes of acicular pyroxene. Rock has a distinctive salt-and-pepper appearance on fresh surface

**ag** ALKALI FELDSPAR GRANITE (PRECAMBRIAN)—Pink and light-red, medium-grained alkali granite consisting of about 16 to as much as 40 percent quartz, 50 to 60 percent alkali feldspar (perthite, microcline, and late interstitial albite) and 2 to 10 percent sodic amphibole. The amphibole is chiefly kataphorite or arfvedsonite

**SYMBOLS**

— RHYOLITE OR COMENDITE DIKE

— CONTACT—Approximately located

--- FAULT—Dashed where approximately located; dotted where concealed; queried where position uncertain; arrows show direction of relative horizontal movement; in section, T = toward, A = away from observer

STRIKE AND DIP OF BEDS

—|— Inclined, showing dip

203272 X STATION LOCALITY—Showing sample number

Prefix 203 (E. B. Ekren)

Prefix 128 (D. B. Stoesser)

**DATA STORAGE**

No Mineral Occurrence Documentation System (MOS) localities were identified in the quadrangle.

Work materials related to the Jibal al Misma quadrangle are archived as USGS-DF-04-01 (Ekren, 1984), which is available for reference in the Jiddah office of the U.S. Geological Survey Saudi Arabian Mission.

**REFERENCES CITED**

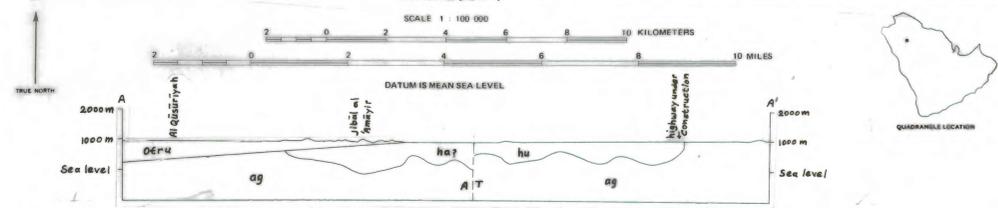
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Aerial photography 1956 and controlled mosaic 1959  
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This report has not been edited or reviewed for conformity with U.S. Geological Survey standards and nomenclature.



**RECONNAISSANCE GEOLOGIC MAP OF THE JIBAL AL MISMA QUADRANGLE, SHEET 27/40 C, KINGDOM OF SAUDI ARABIA**  
 by  
**E. B. Ekren**  
 1984