PREPARED IN COOPERATION WITH
THE ECONOMIC DEVELOPMENT ADMINISTRATION
OF THE COMMONWEALTH OF PUERTO RICO

Base map by Topographic Division
U. S. Geological Survey, 1957
2000-meter grid based on
Puerto Rico coordinate system

APPROXIMATE MEAN

SCALE 1:20 000

CONTOUR INTERVAL 10 METERS

Geology by R. P. Briggs and
P. A. Gelabert, 1956–58

EXPLANATION

QUATERNARY

Recent

Qat — **Alluvial deposits and low level terrace deposits**
Generally well-sorted sand, gravel, and clay in stream beds, alluvial plains, and low-level terraces; includes some debris from earth flow and avalanche

Qd — **Debris from earth and rock flow and debris avalanche**
Poorly sorted material ranging from clay to boulders 3 meters in diameter

Ql — **Landslide blocks**
Coherent masses of rock that have moved downhill by force of gravity

Qth — **Higher terrace deposits**
Generally well-sorted sand and gravel deposits on terraces from 15 to 40 meters above present stream levels

CRETACEOUS

Upper Cretaceous

Kc, Kcrl, Kcr, Kcb — **Coamo formation**
Pale-grayish-red purple tuffaceous breccia containing fragments of lava most prevalent; grayish-red tuffaceous conglomerate and light-brown thick- and thin-bedded tuffaceous sandstone common; locally grayish-red-purple lava and light-brown fine tuffaceous breccia containing sandstone fragments occur.
Kcr, *El Revés member, light-brown thin-bedded sandstone, dark-gray calcirudite, and pale brown conglomerate containing fossils and fragments of medium-dark-gray crystalline limestone.*
Kcrl, *thin lenses of crystalline limestone and extensive calcirudite within the El Revés member.*
Kcb, *Botijas limestone member, principally fossiliferous medium-dark-gray massive crystalline limestone and medium-gray thick bedded and massive calcarenite*

FAULTED CONTACT

Kca — **Cariblanco formation**
Dominantly medium-dark-gray to light brownish-gray tuffaceous sandstone and breccia in north, includes some light-brown tuffaceous siltstone and medium-dark-gray to brownish-gray water-laid lapilli tuff and tuffaceous conglomerate; some dark-bluish-gray lava present in northeast. Dominantly brownish-gray to dark-greenish-gray tuffaceous conglomerate with well-rounded to subrounded lava cobbles in south, includes some light-brown to brownish-gray thin sandstone and siltstone interbeds

POSSIBLE UNCONFORMITY

Kl, Klts, Klb, Kls — **Formation L**
Dominantly dark-bluish-gray to dark-greenish-gray lava with numerous augite phenocrysts as large as 8 mm; locally feldspar phenocrysts to 20 mm; accessory magnetite common; pillow lava typical; includes some dark-greenish-gray flow breccia.
Kls, *lenses of light-brown sandstone.*
Klts, *tuffaceous sandstone and siltstone unit, well indurated medium-dark-gray to light-brownish-gray, with brownish-gray water-laid lapilli tuff; locally intertongues with upper part of formation L.*
Klb, *limestone unit, principally medium-dark-gray to grayish-black massive crystalline limestone; discontinuous; locally very fossiliferous*

Krc, Krf, Krlu, Kr, Krll, Krb, Krl, Krt, Krq, Krr — **Robles formation**
Dominantly medium-gray to light-brown thin-bedded tuffaceous sandstone; medium-gray to light-brown tuffaceous siltstone and medium-dark-gray to brownish-gray water-laid lapilli tuff common.
Krb, *lenses of brownish-gray to dark-gray tuffaceous breccia and conglomerate and conglomeratic tuff.*
Krf, *discontinuous grayish-black to dark-bluish-gray lava flows; present north of Barranquitas.*
Krq, *yellowish-brown to dark-reddish-brown to dark-gray chert and jasper; at base southeast of Barranquitas.*
Krc, *Cañabón lava member, principally grayish-black to dark-bluish-gray augite phenocryst lava.*
Krt, *Las Tetas lava member, generally densely porphyritic bluish-black to dark-greenish-gray lava; type of phenocryst ranges from wholly feldspar at some places to wholly augite at others; locally discontinuous.*
Krl, *Lapa lava member, generally bluish-black to medium-dark-gray lava characterized by complexly twinned feldspar phenocrysts in its lower part and augite phenocrysts in its upper part; locally split into upper, Krlu, and lower, Krll, units by lenses of light brown sandstone and siltstone.*
Krr, *Río Matón limestone member, discontinuous medium-dark-gray massive crystalline limestone in northeast; thin lenses near base east of Barranquitas; absent elsewhere*

POSSIBLE UNCONFORMITY

Upper(?) Cretaceous

Kpr, Kprs — **Pre-Robles rocks**
Dominantly bluish-black to dark-greenish-gray lava and flow breccia; dark-brownish-gray and dark-greenish-gray massive tuffaceous conglomerate and massive tuffaceous breccia common; dark-brownish-gray water-laid lapilli tuff is a minor constituent.
Kprs, *lenses of light-brown to dark-brownish-gray tuffaceous sandstone and siltstone; locally extensive*

INTRUSIVE IGNEOUS ROCKS

CRETACEOUS OR TERTIARY

Upper Cretaceous or Eocene

hd — **Hornblende diorite**
Generally equicrystalline speckled medium-gray and black rock of plagioclase and acicular hornblende; quartz minor or absent; in the southwest also includes some augite diorite porphyry and small areas of country rock

dp — **Diorite porphyry**
Black augite phenocrysts as long as 15 mm in a medium-dark-gray plagioclase groundmass; occurs in short thick dikes

Area in which small bodies of diorite porphyry and hornblende diorite are common
Pipes as small as 1 meter in diameter occur

dg — **Diorite and (or) gabbro**
Medium to coarse speckled black and medium-dark-gray intrusive rock consisting of plagioclase, augite, hornblende after augite, and primary(?) hornblende

ds — **Diorite sill**
Medium-dark-gray equicrystalline igneous rock speckled black; dominantly of plagioclase and hornblende; quartz minor or absent; pale-reddish-brown iron oxides locally conspicuous in upper part; restricted to the Honduras sill

qp — **Quartz porphyry**
Dipyramidal quartz phenocrysts in white to tan altered groundmass probably of clay minerals restricted to Barranquitas stock and small stock to the north; unaltered hornblende diorite and chloritized hornblende diorite occur at places near the borders of the Barranquitas stock; includes some altered country rock within the Barranquitas stock

as — **Andesite(?) sill**
Coarse augite phenocrysts in aphanitic greenish-black groundmass

dk — **Dikes**
Generally dark-bluish-black rocks with fine augite phenocrysts in an aphanitic groundmass; a few dikes are dark gray and more coarsely crystalline

HYDROTHERMALLY ALTERED ROCKS

pqa — **Pyrite-sericite quartzite**
Dominantly pale-yellowish-gray quartzose rocks showing box work and a sericite surface sheen; also includes banded quartz-chlorite(?) rocks and occasional boulders of partly altered hornblende diorite

qka — **Quartz-kaolinite altered rock**
Dominantly white to yellowish-gray quartz and kaolinite with some reddish-brown to grayish-red-purple iron oxide staining

vq — **Vein quartz**

WEATHERED MATERIALS

Tripoli
Very light-gray to white very fine grained silica-rich and iron-poor material

Lateritic soil and saprolite
Dusky-red to dark-reddish-brown clayey material with relatively high alumina and iron oxide content; at places containing residual boulders; gold-bearing in the vicinity of the Barranquitas stock

gs — **Gossan**
Moderate-reddish-brown to dark-grayish-red-purple hydrous iron oxides dominant; contains some fragments of light-brown pyrite-sericite quartzite

Contact
Dashed where approximately located; short dashed where indefinite; dotted where concealed

Fault
Dashed where approximately located; queried where doubtful; dotted where concealed; U, upthrown side; D, downthrown side; arrows show apparent directions of lateral movement; arrow normal to fault shows direction of dip of fault plane

Zone of sheared and brecciated rock

Anticline
Showing crest line and direction of plunge; dashed where approximately located; queried where doubtful

Syncline
Showing position of trough; dashed where approximately located

Strike and dip of beds
Queried where doubtful

Strike of vertical beds

Strike and dip of overturned beds
Queried where strike and (or) dip doubtful

Horizontal beds
Queried where doubtful

Strike and dip of beds that may be overturned
Queried where strike and (or) dip doubtful

Strike and dip of lava flow and flow breccia
Queried where doubtful

Quarry

Prospect pit or conspicuous mineral occurrence
Au indicates reported presence of gold; Cu indicates copper

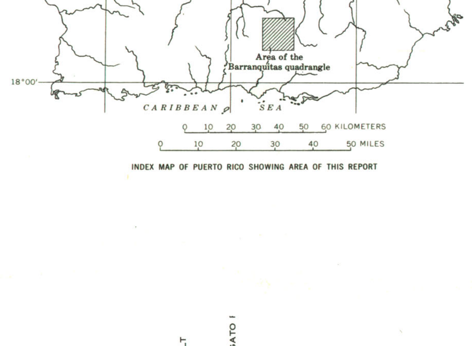
Abandoned adit
Au indicates reported presence of gold

SECTIONS ONLY

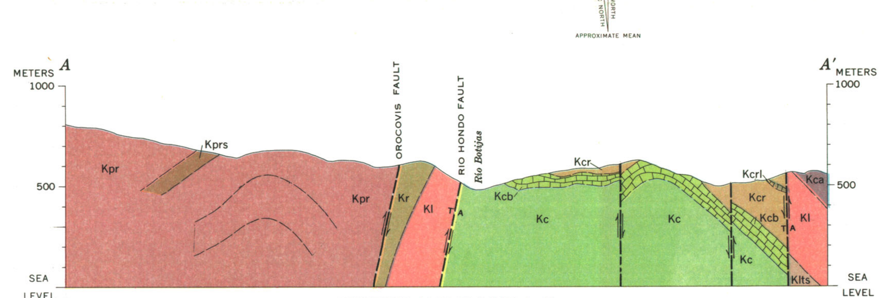
Vertical fault
Arrows show relative direction of displacement

Reverse fault
Arrows show relative direction of displacement

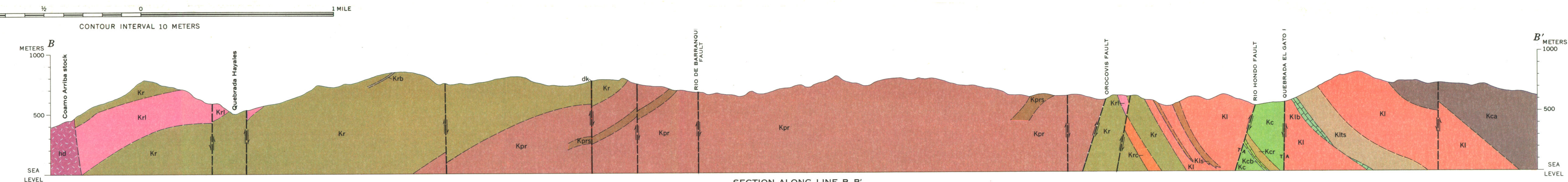
Transverse or horizontal displacement along fault plane
T, relative displacement toward the observer; A, relative displacement away from the observer. These symbols combined with arrow symbols indicate a relative diagonal displacement



INDEX MAP OF PUERTO RICO SHOWING AREA OF THIS REPORT



SECTION ALONG LINE A–A'



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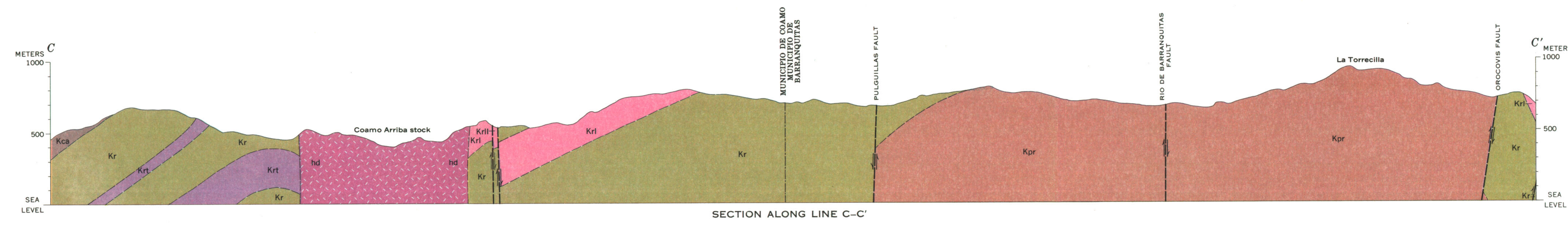

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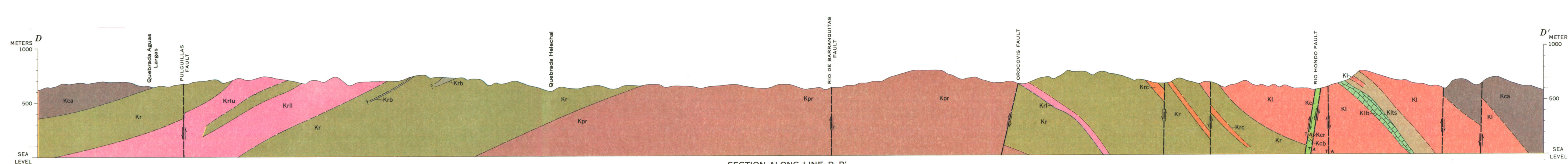

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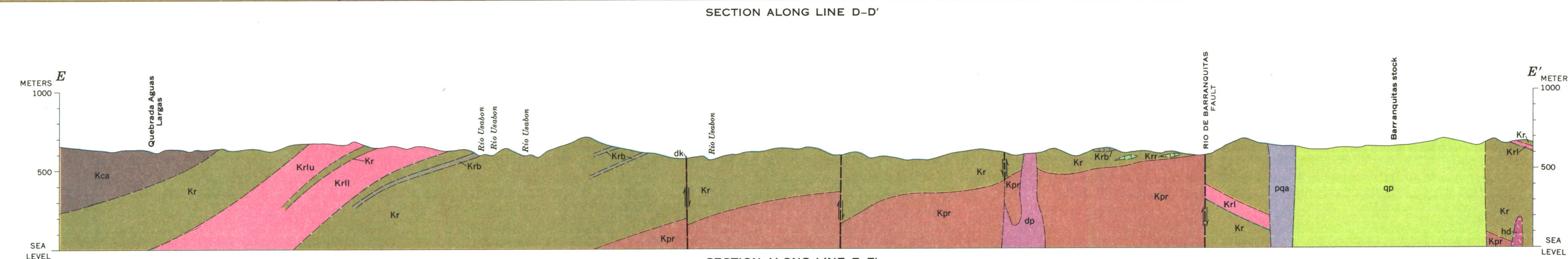
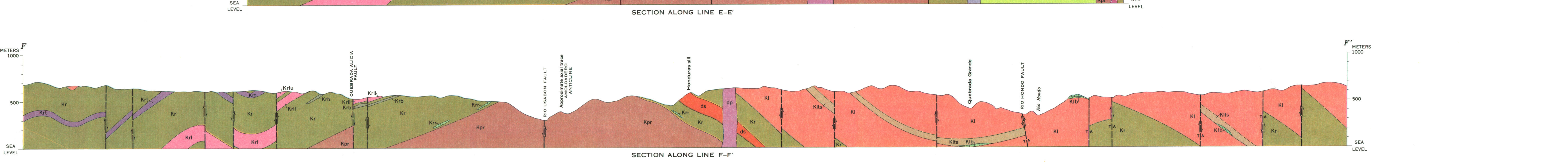


SECTION ALONG LINE E–E'



SECTION ALONG LINE F–F'

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—10308

PRELIMINARY REPORT OF THE GEOLOGY OF THE BARRANQUITAS QUADRANGLE, PUERTO RICO

By
R. P. Briggs and P. A. Gelabert
1962

For sale by U. S. Geological Survey, price 1.50