STATE BUREAU OF MINES AND MINERAL RESOURCES
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NEW MEXICO INSTITUTE OF MINING AND TECHNOLOGY
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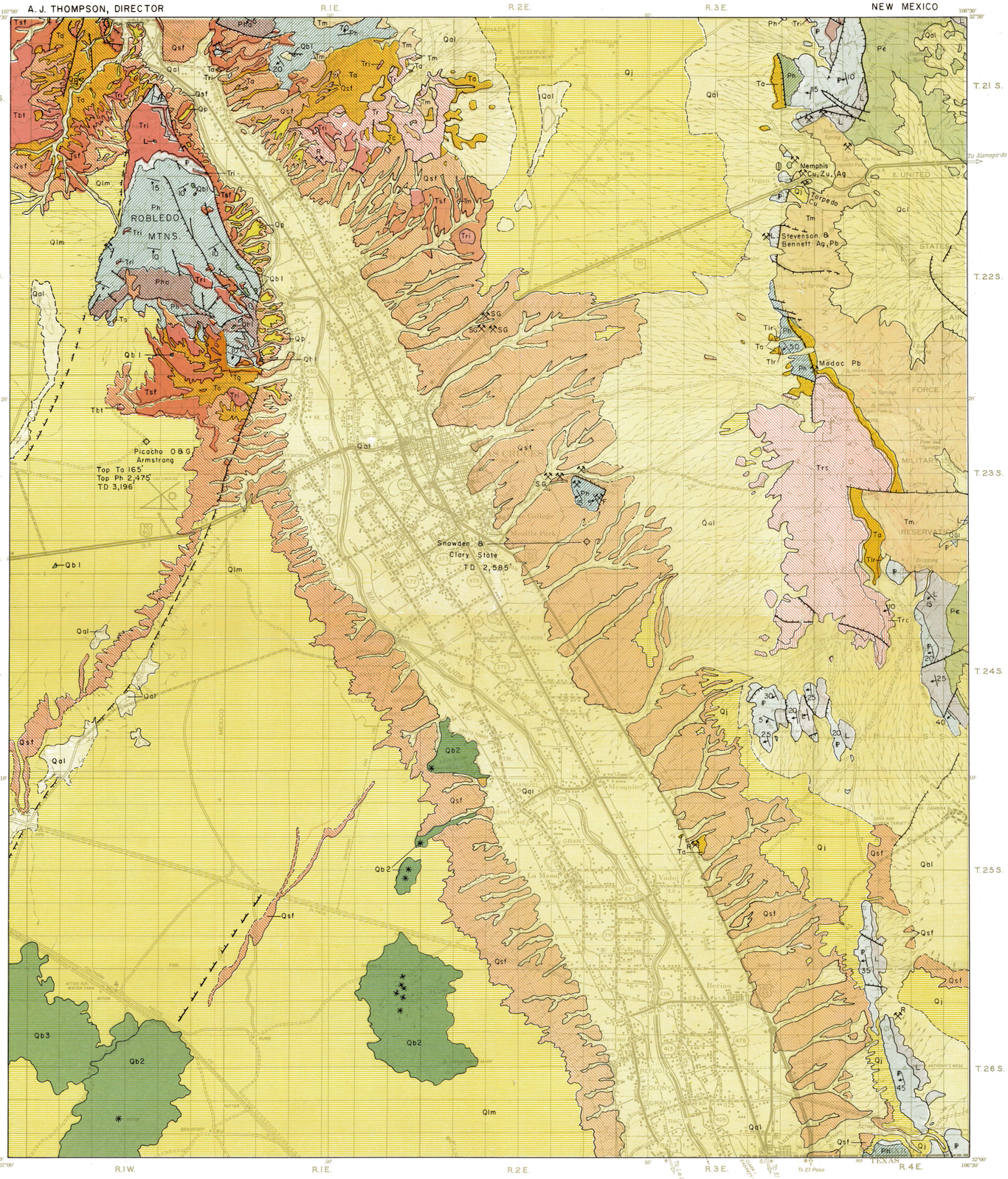
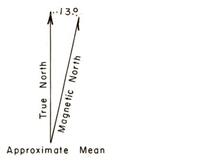
GEOLOGY
LAS CRUCES QUADRANGLE
NEW MEXICO

GEOLOGIC MAP 14

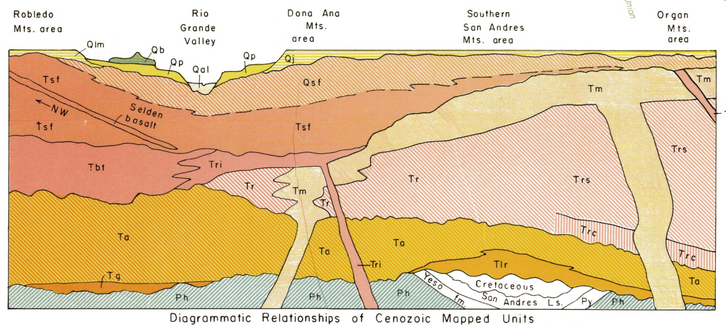


Base from Las Cruces quadrangle of New Mexico State Highway Department.

Geology mapped in 1953, 1955. Organ and part of southern San Andres Mts. revised from K. C. Dunham (1935). Geologic cartography by Bob Price and W. E. Arnold.



Approximate Mean Declination, 1960



Diagrammatic Relationships of Cenozoic Mapped Units

RECONNAISSANCE GEOLOGIC MAP OF LAS CRUCES THIRTY-MINUTE QUADRANGLE

by Frank E. Kottlowski, 1960

Scale 1:126,720

0 1 2 3 4 5 6 7 8 9 10

Statute Miles

EXPLANATION

Qal — Alluvium. Chiefly stream deposits of larger arroyos; recent playa deposits on La Mesa and Jornada surfaces, and southeast of Bishop's Cap Mtn; recent sands and gravels on the Rio Grande floodplain, including sand dunes; alluvium fans (gravel, sand, and silt) bordering the mountains.

Qb — Basalt flows, cones, and necks of several eruptive periods. Partly eroded cones and volcanic necks in the Robledo and Dona Ana Mts. are of basalt (Qb1) characterized by large black pyroxene crystals and aggregates of olivine, similar to the partly buried flows south of the quadrangle near Kilbourne Hole. The cluster of cones and flows near (west and south) San Miguel consist of unweathered olivine basalt (Qb2) extruded onto the surface of the Picacho terrace. The Aden basalt (Qb 3) flow west and south of Afton, and the cluster of cinder cones 4 miles south of Afton, are barely touched by erosion and may be only a few thousand years old.

Qp — Calichified gravel underlying Picacho terraces. Locally 100-200 feet thick with interbedded sand and massive silts; includes local lenses of river gravel at two levels, the younger remnants 100-140 feet above the Rio Grande floodplain, and older gravels 25-40 feet higher.

Qlm, Qj — Calichified gravel and silt underlying La Mesa surface west of the Rio Grande and the Jornada surface east of the river valley. Locally includes a thin veneer of recent stream alluvium, parts of alluvial fans and high-level gravels near the mountains, and extensive areas of present-day eolian sand, which mask the older gravels.

UNCONFORMITY

Qsf — Upper Santa Fe group. Bolson sediments; near mountains some stream alluvium and alluvium fans ranging to Recent in age are included; locally covered by dunes. Relatively unconsolidated sand and gravel, derived chiefly from local sources, and containing a Pleistocene vertebrate fauna. This unit was included in the Santa Fe fm. by Bryan (1938) and is roughly correlative with the Ancho fm., the upper part of the Santa Fe group of Baldwin (1956) and Kottlowski (1953). The unit is more than 400 feet thick from Las Cruces southward to Anthony.

Tsf — Lower Santa Fe group. Probable Pliocene sediments, consisting of (a) a lower unit (more than 115 feet thick) of pink, light-gray, and yellow conglomeratic sandstone, sand, and silt, containing many limy concretions, and (b) an upper sequence of light-gray sandstone, pinkish siltstone, brown clayey silt, lenses of sandy caliche limestone, and a thick medial tongue of boulder conglomerate. The upper unit is more than 560 feet thick in the southern Robledo Mts. Near Radium Springs, the Selden basalt tongue, a weathered olivine basalt, occurs near the base of the upper unit; to the north, this unit thickens above the Selden basalt to more than 1,300 feet. These lower beds of the Santa Fe group, probably in part correlative with the Tesuque fm. of Baldwin (1956), are not exposed south of Las Cruces until 6 miles south of Chamberino, near La Union, where Bryan (1938) reported a Pliocene vertebrate fauna.

UNCONFORMITY

Tbt — Bell Top fm. Light-colored rhyolite and quartz latite flows, welded tuffs, bedded tuffs, tuff breccia, volcanic sandstone and conglomerate, pumice, and domes; more than 800 feet thick. Northwest and west of the map area, the Bell Top fm. is overlain by the Uvas basaltic sequence capping the higher ridges of Sierra de las Uvas. Rhyolites are characterized by a high sanidine content (more than 7% K_2O).

Tri — Intrusive rhyolite and associated breccia. Tan, porphyritic; contemporaneous with, and the partial feeders and source of, the Bell Top fm. rocks.

UNCONFORMITY

Tm — Monzonitic intrusive rocks. Ranges from quartz monzonite in the Organ Mts. batholith to syenite (sills and dikes) in the Dona Ana Mts.

Tr, Trs, Trc — Rhyolite flows, tuff breccia, and welded tuff. Reddish-brown aphanitic rocks with sparse phenocrysts of quartz and sanidine; over 1,200 feet thick in the Dona Ana Mts. Divided by Dunham (1935) in the Organ Mts. into Soledad rhyolite (Trs) above, a 2,500-foot-thick mass of reddish to purplish flows and welded tuffs, and the Cueva tuff (Trc) below, 120-250 feet of light-colored tuff and flows.

UNCONFORMITY

Ta — Andesite and latite flows, tuff breccias, and crystal tuffs. Greenish, grayish, and purplish; characterized by much biotite, or biotite and hornblende phenocrysts. More than 1,600-2,100 feet thick in Robledo Mts. Includes Orejon andesite (600 feet thick) of Dunham (1935) in the Organ Mts.

Tg, Tlr — Tg - Interbedded gypsum, latitic crystal tuff, and silty limy claystone in southern Robledo Mts.; basal limestone-cobble conglomerate, unit is about 330 feet thick.

Tlr - Love Ranch fm. (Kottlowski et al., 1956) in San Andres Mts. (north of map area) and Organ Mts. About 2,000 feet of intercalated limestone-boulder conglomerate, red siltstone, and minor tuff at type section near Love Ranch, 8 miles north of Organ (village), where it overlies Upper Cretaceous beds; 0-125 feet thick in Organ Mts., occurring as lenses unconformably overlying Pennsylvanian and Permian rocks. May be roughly correlative with Tg.

UNCONFORMITY

Ph, Pha — Permian Hueco limestone. About 1,715 feet thick in Robledo and Dona Ana Mts., including an Abo tongue (Pha) in the upper half of the formation; 1,355 feet thick in southern San Andres Mts., excluding Abo red beds that gradationally overlie the Hueco is in that area. The unit contains fusulinids and gastropods of Wolfcampian age. In Robledo and Dona Ana Mts., the map unit Ph includes the underlying 190-foot-thick Bursum limestone faunal unit.

P — Pennsylvanian limestones, shales, siltstone, and sandstones. Morrowan (?) and Derryan to Virgilian in age; about 665 feet thick in Robledo Mts., 2,800 feet thick in southern San Andres Mts., and 2,700 feet thick (Harbour, 1958) in northern Franklin Mts.

UNCONFORMITY

L — Lower Paleozoic beds. Mississippian: Caballero fm. in Robledo Mts. (110 feet); Caballero, Lake Valley, and Rancheria fms. in San Andres (445 feet) and Organ Mts.; Las Cruces, Rancheria, and Helms fms. in Franklin Mts. (415 feet). Devonian: shaly beds in Robledo and San Andres Mts. (85-130 feet); shales underlain by siltstone and cherty limestone in Franklin Mts. (115 feet). Silurian Fusselman dolomite (95-600 feet thick; thins northward). Montoya dolomite, upper Ordovician (310-430 feet; thins northwestward); Lower Ordovician El Paso limestone (830 to about 1,000 feet thick; thins northward); Cambrian-Ordovician Bliss sandstone (120-155 feet), exposed in southern San Andres Mts. north of San Augustin Pass, in southeastern most Organ Mts. (thins northward).

UNCONFORMITY

Pc — Precambrian rocks. Dominantly granite, with minor amounts of granite pegmatite and aplite, mica-orthoclase-quartz gneiss, diorite, diabase, and chlorite schist.

QUATERNARY
TERTIARY
PERMIAN
PENNSYLVANIAN
LOWER PALEOZOIC
PRECAMBRIAN

- Volcanic crater or cinder cone.
- Abandoned oil test.
- 75 — Average strike and dip of beds.
- Mine or quarry (Ag-silver, Cu-copper, F-fluorite, G-gypsum, I-iron, Pb-lead, R-riprap rock, SG-sand and gravel, Zn-zinc).
- Contact; dashed where approximately located within 1/4 mile.
- Fault: dashed where approximately located or inferred. Hachures on downthrown side.

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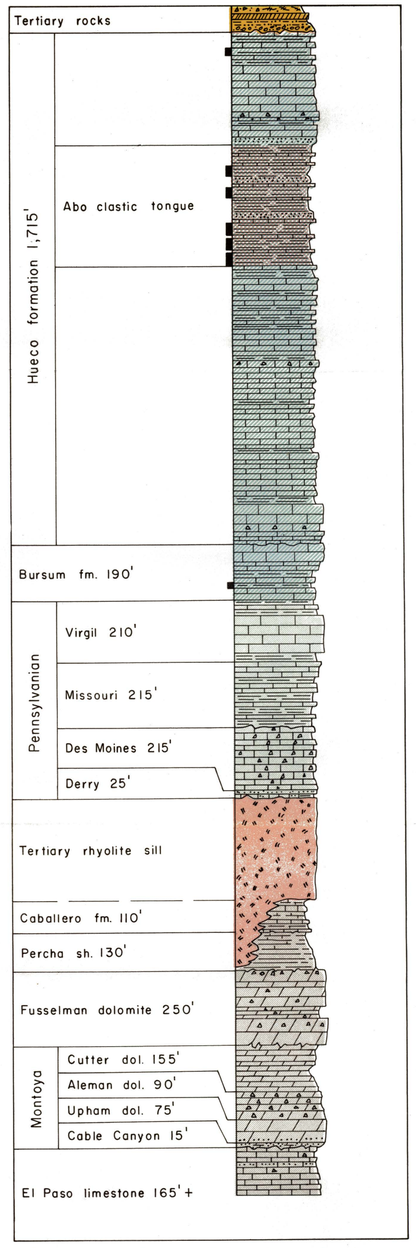
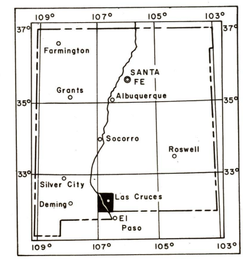


Columnar section of Paleozoic rocks in Robledo Mountains



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