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# BOUGUER GRAVITY MAP OF CALIFORNIA
# KINGMAN SHEET

Scale 1:250,000
1973

filed w/ folio




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Price $2.00

KINGMAN GRAVITY

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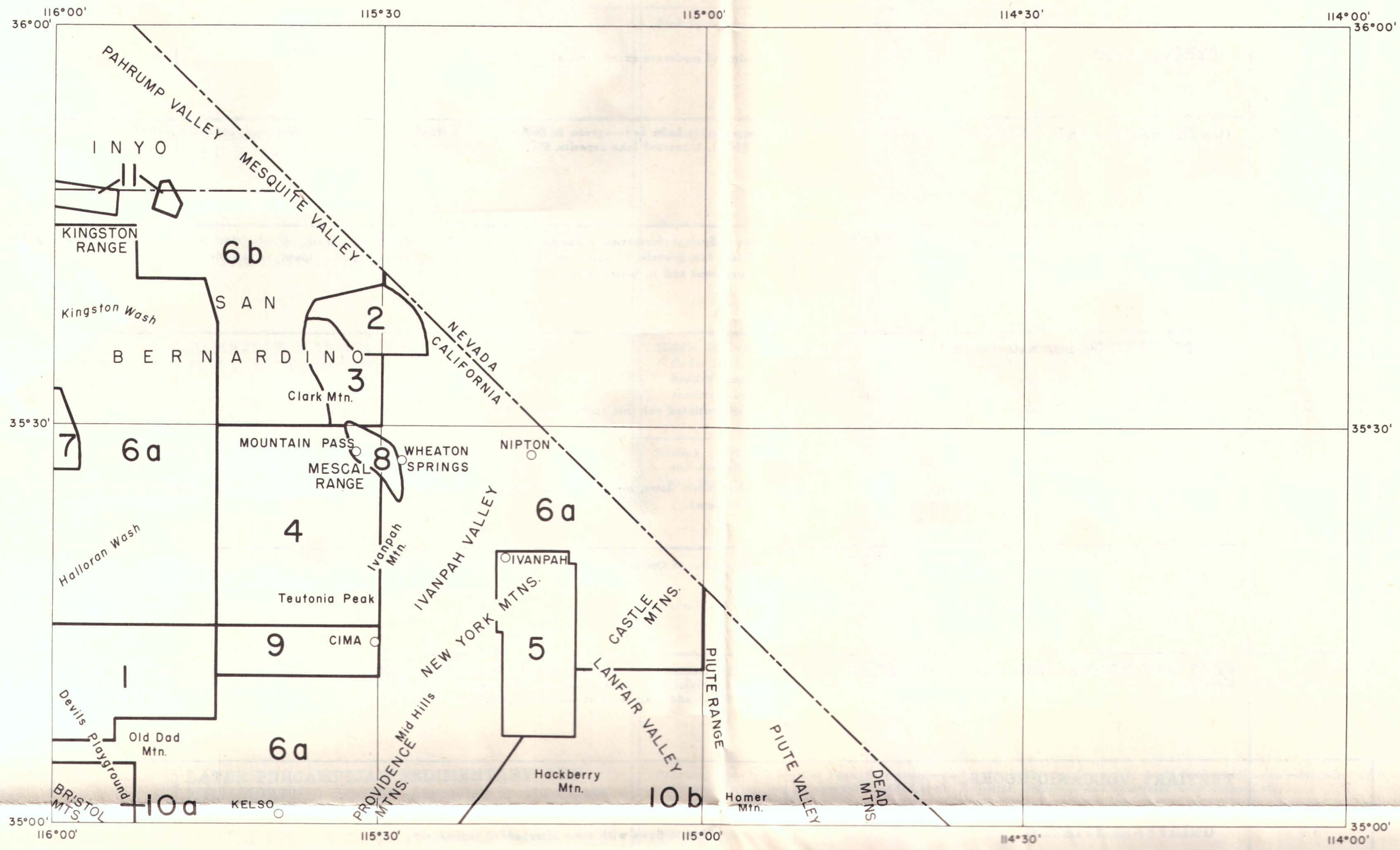
# EXPLANATORY DATA
# KINGMAN SHEET
## GEOLOGIC MAP OF CALIFORNIA
### OLAF P. JENKINS EDITION

Complied by Charles W. Jennings, 1961

THIS DATA SHEET IS A REPRINT OF THE DATA SHEET ACCOMPANYING THE KINGMAN SHEET, GEOLOGIC MAP OF CALIFORNIA, OLAF P. JENKINS EDITION, FIRST PUBLISHED IN 1961. IT HAS NOT BEEN ALTERED. THE GEOLOGY SHOWN ON THE KINGMAN SHEET OF THE BOUGUER GRAVITY MAP OF CALIFORNIA IS ALSO REPRINTED FROM THE GEOLOGIC MAP OF CALIFORNIA, 1961. THE GRAVITY DATA PRESENTED WERE COMPILED IN 1971 AND PUBLISHED IN 1973.

# INDEX TO GEOLOGIC MAPPING
## USED IN COMPILATION OF THE KINGMAN SHEET




1. Barca, Richard A., Geology of the northern portion of the Old Dad Mountain quadrangle, San Bernardino County, California, scale 1: 24,000, University of Southern California, unpublished M. A. thesis, 1960.
2. Clary, Michael R., Geology of the eastern part of the Clark Mountain Range, San Bernardino County, California, scale 1: 24,000, University of Southern California, unpublished M. A. thesis, 1959.
3. Dobbs, Phillip H., Geology of a portion of the Clark Mountain quadrangle, California, scale 1: 24,000, University of Southern California, unpublished M. A. thesis in preparation (1960).
4. Evans, James R., Geology of the Mescal Range, San Bernardino County, California, scale 1: 24,000. University of Southern California, unpublished M. A. thesis, 1958.
   Evans, James R., Geologic map of the Mescal Range quadrangle, California, scale 1: 62,500, California Division Mines, unpublished (1959-60).
5. Haskell, Barry S., The geology of a portion of the New York Mountains and Lanfair Valley, scale 1: 31,250, University of Southern California, unpublished M. A. thesis, 1959.

6a. Hewett, D. Foster, 1956, Geology and mineral resources of the Ivanpah quadrangle, California and Nevada: U. S. Geological Survey Prof. Paper 275, 172 pp., Pl. 1: Geologic map and sections of the Ivanpah quadrangle, California-Nevada, scale 1: 125,000. (Sand dunes adapted by compiler from Old Dad Mountain topographic quadrangle, scale 1: 62,500; playa lake deposits adapted from Roach Lake, Ivanpah, and Clark Mountain quadrangles, scale 1: 62,500; minor adjustments made to fit modern topographic maps). (Modification in Ivanpah Mountain by R. H. Merriam, personal communication, 1960).

6b. Hewett, D. Foster, 1956, (see 6a), modified by Lauren A. Wright in area covered by parts of Horse Thief Springs, Shenandoah Peak, Kingston Peak, and Clark Mountain, quadrangles, scale 1: 62,500, California Division Mines reconnaissance mapping for State Geologic Map (1958).

7. Kupfer, Donald H., 1960, Thrust faulting and chaos structure, Silurian Hills, San Bernardino County, California: Geological Society America Bulletin, vol. 71, pp. 181-214, Pl. 2: Geologic map and section of the Silurian Hills, scale 1" = 3000 feet (also published in California Division Mines Bulletin 170, Map Sheet 19).
   Kupfer, Donald H., Structural geology of the Silurian Hills, San Bernardino County, California, scale 1: 24,000, Yale University, Ph.D. thesis, 1951. (SE portion of thesis map unpublished).
8. Olson, J. C., Shawe, D. R., Pray, L. C., and Sharp, W. P., 1954, Rare-earth mineral deposits of the Mountain Pass district, San Bernardino County, California: U. S. Geological Survey Prof. Paper 261, 75 pp., Pl. 1: Geologic map and cross sections of Mountain Pass district, scale 1: 20,000.
9. Sharp, Robert P., 1957, Geomorphology of Cima Dome, Mojave Desert, California: Geological Society America Bulletin, vol. 68, pp. 273-290, Fig. 2: Map of pertinent geological relations at Cima Dome, scale 1" = 16,000 feet.

10a. Southern Pacific Company, Land Dept., Regional geologic mapping program, Geo. A. Kiersch, geologist-in-charge. Geologic map of T11N R10E SBM (SW part of Old Dad Mountain quadrangle) by W. L. Coonrad, scale 1: 24,000, unpublished (1959).

10b. Southern Pacific Company, Land Dept., Regional geologic mapping program, Geo. A. Kiersch, geologist-in-charge. Geologic maps of T11-13N, R15-22E SBM (parts of Homer Mountain, Davis Dam, Lanfair Valley, and Mid Hills quadrangles) by H. F. Bonham, M. S. Tischler and W. H. Spurck, scale 1: 24,000, unpublished (1960). Sections unmapped by S. P. Company on the Homer Mountain and Dead Mountain quadrangles completed by C. W. Jennings and R. G. Strand, California Division of Mines reconnaissance mapping and photogeologic interpretation (1957 and 1960).

11. Wright, Lauren A., Geologic maps of the Excelsior mine area and the talc-bearing belt on the northwestern side of the Kingston Range, California, scale 4 inches = 1 mile, California Division Mines, talc report in progress (1957-60).

**For a complete list of published geologic maps of this area see Division of Mines Special Report 52.**

View looking west of Recent cinder cones north of Old Dad Mountain. Note latest basalt flow in center of photo which extends out onto the alluvium.

# STRATIGRAPHIC NOMENCLATURE— KINGMAN SHEET

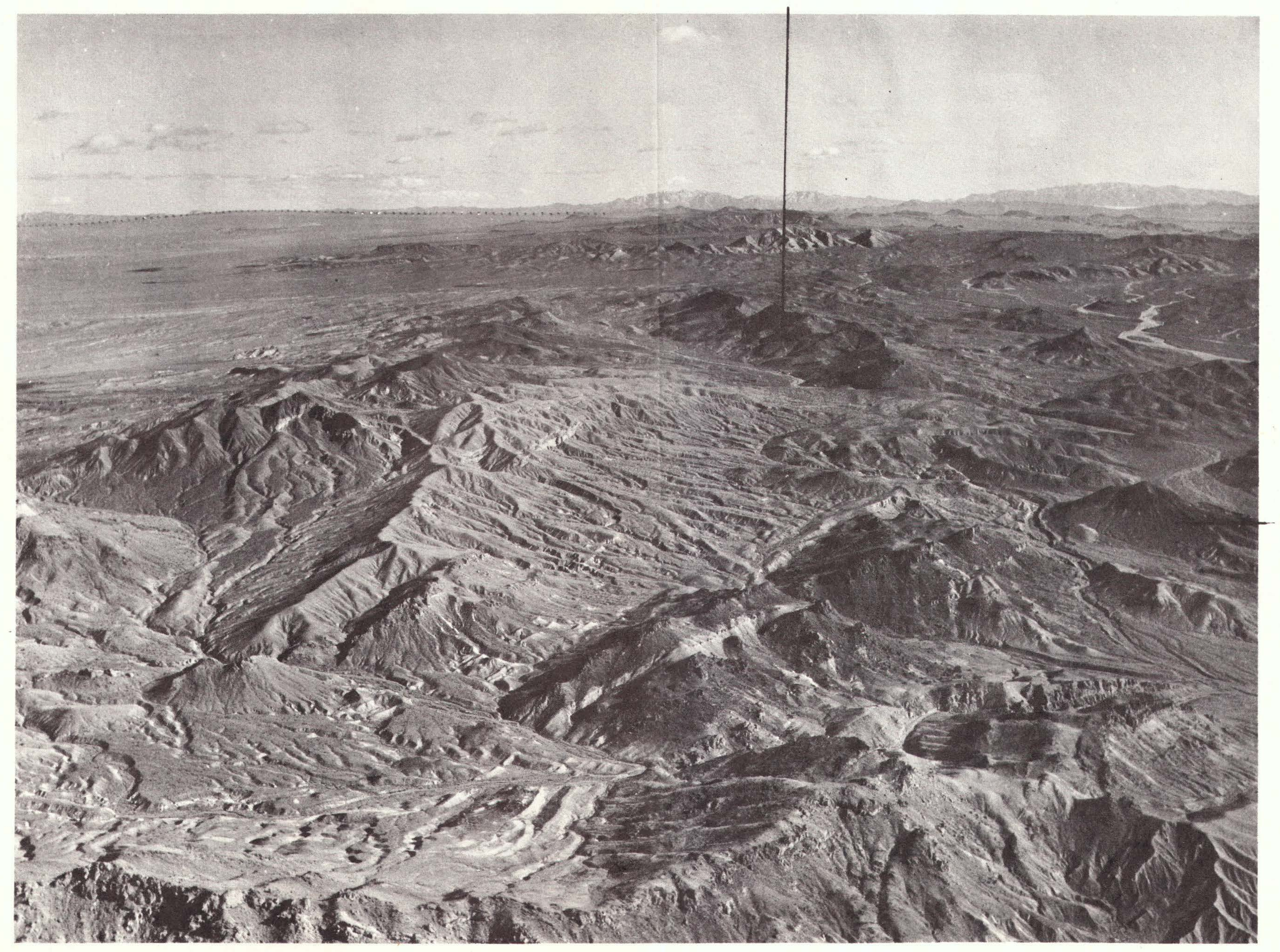
| AGE | STATE MAP SYMBOL | STATE MAP UNIT | STRATIGRAPHIC UNITS AND CHARACTERISTIC LITHOLOGIES (The formally named formations grouped within an individual State Map Unit, are listed in stratigraphic sequence from youngest to oldest.) |
|---|---|---|---|
| CENOZOIC – QUATERNARY – Recent | Qs | **RECENT DUNE SAND** | Sand dunes, and other wind-blown sand deposits. |
| | Qal | **RECENT ALLUVIUM** | Stream and valley alluvium. Alluvial fan deposits. Mantle of detrital material derived from granular disintegration of the granitic rocks of Cima Dome. |
| | | **RECENT VOLCANIC ROCKS:** | |
| | $Qrv^b$ | **BASALTIC** | Well-preserved olivine basalt flows on west side of Cima Dome, associated with numerous symmetrical cinder cones. |
| | $Qrv^p$ | **PYROCLASTIC** | Cinders of moderate extent around larger cones. |
| | Ql | **QUATERNARY LAKE DEPOSITS** | Chemehuevis Lake beds—*green to buff laminated clay and silt, cross-bedded sand, capped by river gravels* (bordering Colorado River). Unnamed lake deposits. Playa deposits. |
| Pleistocene | Qc | **PLEISTOCENE NONMARINE SEDIMENTARY DEPOSITS** | Resting Springs formation—*limestone (tufa), tuffs, sediments and some volcanic flows* in southwestern Pahrump Valley area. Older fan gravels. Elevated and dissected sand and gravel deposits. Local terrace deposits. Conglomerate and sandstone with pumiceous tuff in Bristol Mtns. |
| | | **PLEISTOCENE VOLCANIC ROCKS:** | |
| | Qpv | **UNDIFFERENTIATED** | Undifferentiated volcanic rocks north of Kingston Range. |
| | $Qpv^b$ | **BASALTIC** | Olivine basalt flows, including some pyroclastic rocks on NW side of Cima Dome (distinguished from younger flows by greater dissection). |
| | ✳ | **QUATERNARY AND/OR PLIOCENE CINDER CONES** | Cinder cones of Quaternary age. |
| TERTIARY | Tc | **TERTIARY NONMARINE SEDIMENTARY ROCKS** | Chiefly unconsolidated sediments with some associated volcanic tuffs and flows (Hewett). Bouldery dark red fanglomerate, mud flow breccia, and coarse sandstone and conglomerate (Homer Mtn.—Piute Valley area). Monolithologic megabreccia composed of blocks and fragments of Goodsprings dolomite in Silurian Hills area. |
| | | TERTIARY VOLCANIC ROCKS: | |
| | Tv | **UNDIFFERENTIATED** | Chiefly volcanic flows with some interbedded sedimentary rocks. |
| | $Tv^r$ | **RHYOLITIC** | Rhyolite. |
| | $Tv^a$ | **ANDESITIC** | Latite flows, partly glassy. |
| | $Tv^b$ | **BASALTIC** | Basalt flows and breccias; some latite. |
| | $Tv^p$ | **PYROCLASTIC** | Rhyolitic welded and nonwelded tuffs |
| | $Ti^r$ | **TERTIARY INTRUSIVE (HYPABYSSAL) ROCKS:** **RHYOLITIC** | Rhyolite volcanic plugs. |
| MESOZOIC | gr | **MESOZOIC GRANITIC ROCKS** | Kingston Range monzonite porphyry and Teutonia quartz monzonite; Sands granite. Undifferentiated granitic rocks. (Locally the granitic rocks include small roof pendants, mafic aggregations and silicic to basic dikes.) |
| JURASSIC | Jml | **MIDDLE AND/OR LOWER JURASSIC MARINE SEDIMENTARY AND METASEDIMENTARY ROCKS** | Aztec sandstone—*red, cross-bedded sandstone of aeolian origin* (probably Jurassic age). |
| | JT̄Rv | **JURASSIC AND/OR TRIASSIC METAVOLCANIC ROCKS** | Reddish-brown dacite flow breccias and flows of probable Upper Jurassic age. |
| TRIASSIC | T̄R | **TRIASSIC MARINE SEDIMENTARY AND METASEDIMENTARY ROCKS** | Chinle formation—*red, brown, and green nonmarine sandstone and shale;* Moenkopi formation—*thin-bedded limestone and gray and red shales.* |
| UNDIVIDED | gr-m | **PRE-CENOZOIC GRANITIC AND METAMORPHIC ROCKS** | Meta-igneous rock complex, in part monzonite, some syenite, metadiorite, gabbroic rocks and hornblende gneiss; includes local zones of tectonic breccia (Bristol Mtns. area). |

# STRATIGRAPHIC NOMENCLATURE—Continued

| AGE | STATE MAP SYMBOL | STATE MAP UNIT | STRATIGRAPHIC UNITS AND CHARACTERISTIC LITHOLOGIES (The formally named formations grouped within an individual State Map Unit, are listed in stratigraphic sequence from youngest to oldest.) |
|---|---|---|---|
| PALEOZOIC – UNDIVIDED | ℙ ls | **PALEOZOIC MARINE SEDIMENTARY AND METASEDIMENTARY ROCKS, ls = LIMESTONE AND/OR DOLOMITE** | Riggs formation—*mainly recrystallized carbonate rock* (possibly late Paleozoic age; Silurian Hills area). Goodsprings dolomite—*thick-bedded dolomite and limestone with thin beds of shale and sandstone* (ranges from Upper Cambrian to Devonian). |
| PERMIAN | P̄ | **PERMIAN MARINE SEDIMENTARY AND METASEDIMENTARY ROCKS** | Kaibab limestone—*limestone, some sandy shale, and dolomite with chert stringers.* |
| CARBONIFEROUS | C | **UNDIVIDED CARBONIFEROUS MARINE SEDIMENTARY AND METASEDIMENTARY ROCKS** | Supai formation—*red sandstone and shale, locally gypsiferous, thin-bedded limestone at base.* |
| | CP | **PENNSYLVANIAN MARINE SEDIMENTARY AND METASEDIMENTARY ROCKS** | Bird Spring formation—*limestone, alternating with beds of shale, sandstone and dolomite.* |
| | CM | **MISSISSIPPIAN MARINE SEDIMENTARY AND METASEDIMENTARY ROCKS** | Monte Cristo limestone—*limestone and dolomite.* |
| DEVONIAN | D | **DEVONIAN MARINE SEDIMENTARY AND METASEDIMENTARY ROCKS** | Sultan limestone—*limestone and dolomite.* |
| CAMBRIAN | € | **CAMBRIAN MARINE SEDIMENTARY AND METASEDIMENTARY ROCKS** | Middle Cambrian formations [1]: Bright Angel shale—*shale, dolomite and quartzite;* Bonanza King formation—*dolomite and shale;* Cadiz formation—*shale, limestone and sandstone;* Lower Cambrian formations [1]: Pioche shale—*green and brown shale, interbedded limestone and dolomite;* Tapeats sandstone—*sandstone and quartzite;* Wood Canyon formation—*largely quartzitic sandstone and shale;* Prospect Mtn. quartzite (upper part only—equivalent to Wood Canyon formation). |
| | €? | **CAMBRIAN-PRECAMBRIAN MARINE SEDIMENTARY AND METASEDIMENTARY ROCKS** | Stirling quartzite—*largely thick-bedded pink and gray quartzite;* Johnnie formation—*quartzite with small proportion of shale and dolomite;* Noonday dolomite—*nearly pure dolomite.* Prospect Mtn. quartzite (lower part only—equivalent to Johnnie fm. and Stirling quartzite). |
| PRECAMBRIAN | p€g | **UNDIVIDED PRECAMBRIAN METAMORPHIC ROCKS:** **GNEISS** | Gneiss complex; banded, veined, and migmatic gneiss; augen gneiss (Dead Mtns.—Homer Mtn. area). |
| | p€gr | **UNDIVIDED PRECAMBRIAN GRANITIC ROCKS** | Syenite, shonkinite, granite stocks and dikes, including carbonatite veins and irregular bodies containing rare earth minerals (Mountain Pass area). Biotite granite and local variation to quartz monzonite (Dead Mtns.—Homer Mtn. area). |
| | lp€ | **LATER PRECAMBRIAN SEDIMENTARY AND METAMORPHIC ROCKS**—Algonkian on some maps | Pahrump group: Kingston Peak formation—*shaly quartzite, conglomerate;* Beck Spring dolomite—*dolomite with minor shale;* Crystal Spring formation—*interbedded shale, dolomite, limestone and quartzite with diabase sills.* |
| | ep€ | **EARLIER PRECAMBRIAN METAMORPHIC ROCKS**—Archean on some maps | Undifferentiated gneiss, schist and granite [2] (Hewett). Granitic augen gneiss cut by gabbro pegmatite dikes and silicic dikes (Dead Mtns.—Homer Mtn. area). |

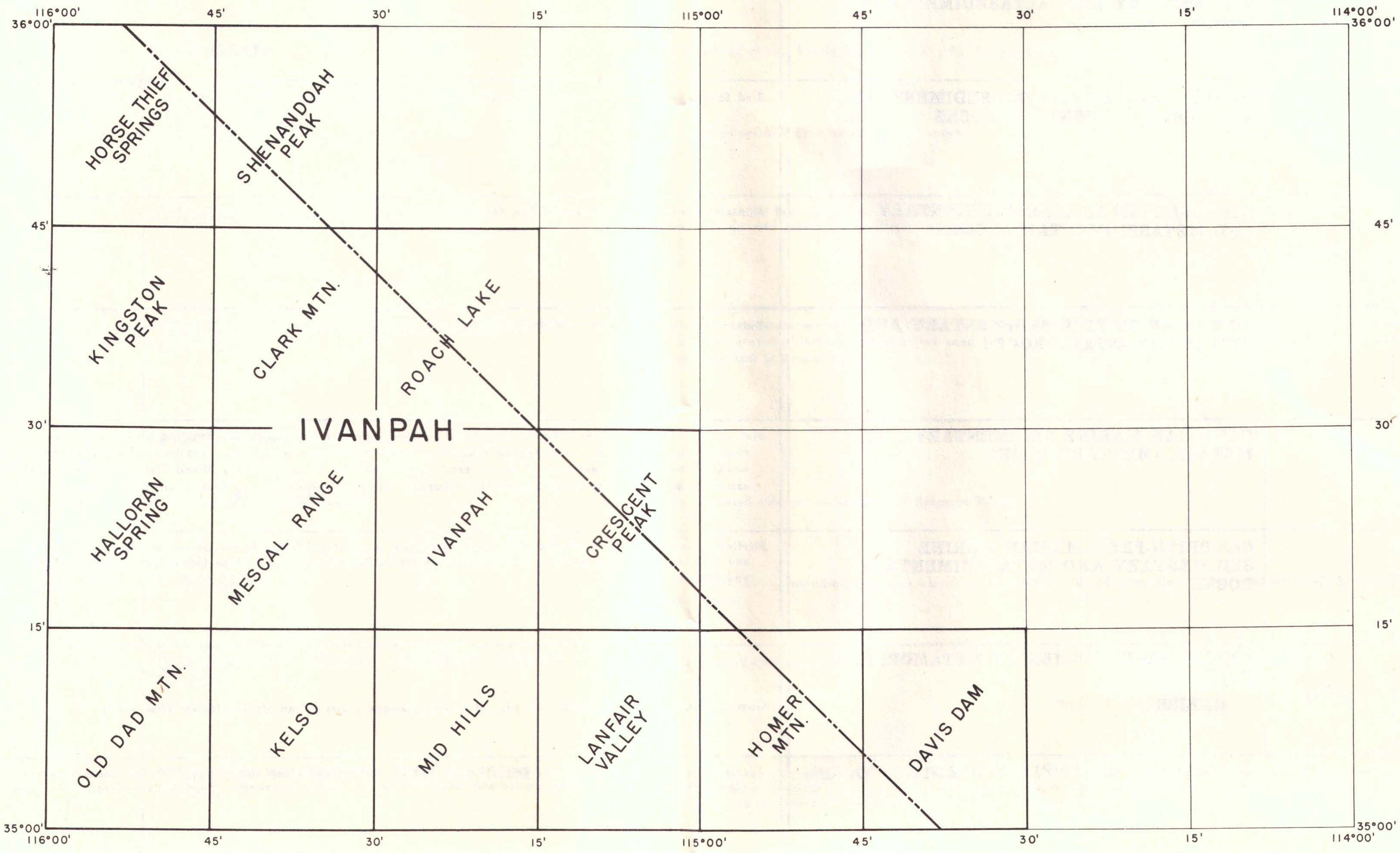
## NOTES

1. Not necessarily in stratigraphic sequence inasmuch as interrelationships of these formations are not completely understood.
2. Some of the intrusive granite may be Mesozoic.




View south across Shadow Mountains. Most of the rocks in the foreground and middle distance consist of interbedded nonmarine strata and flows of Tertiary age. The dark masses labeled ep€ are earlier Precambrian crystalline rocks that have been described by D. F. Hewett as parts of a major thrust plate overlying the Tertiary rocks. *Photo courtesy Pacific Air Industries.*

# TOPOGRAPHIC QUADRANGLES
## WITHIN THE KINGMAN SHEET
## AVAILABLE FROM THE U.S. GEOLOGICAL SURVEY
## 1961




View northeastward from Shadow Mountains, in foreground, to Kingston Range on left skyline and across Mesquite Valley to the Spring Mountains of Nevada on the distant skyline. Shadow Mountains consist mostly of nonmarine strata and volcanic flows of Tertiary age. The dark masses that cap the ridge in right-center consist of Precambrian crystalline rocks which have been interpreted as klippen. Quartz monzonite, of Mesozoic (?) age, constitutes the main mass of the Kingston Range and is intrusive into late Precambrian strata which form the dark masses low on the east flank of the range. *Photo courtesy Pacific Air Industries.*

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# INDEX TO CALIFORNIA GRAVITY MAP SHEETS

The date beneath each map sheet name indicates year of publication. If no date appears, the gravity map sheet had not been published at the time this cover was issued.