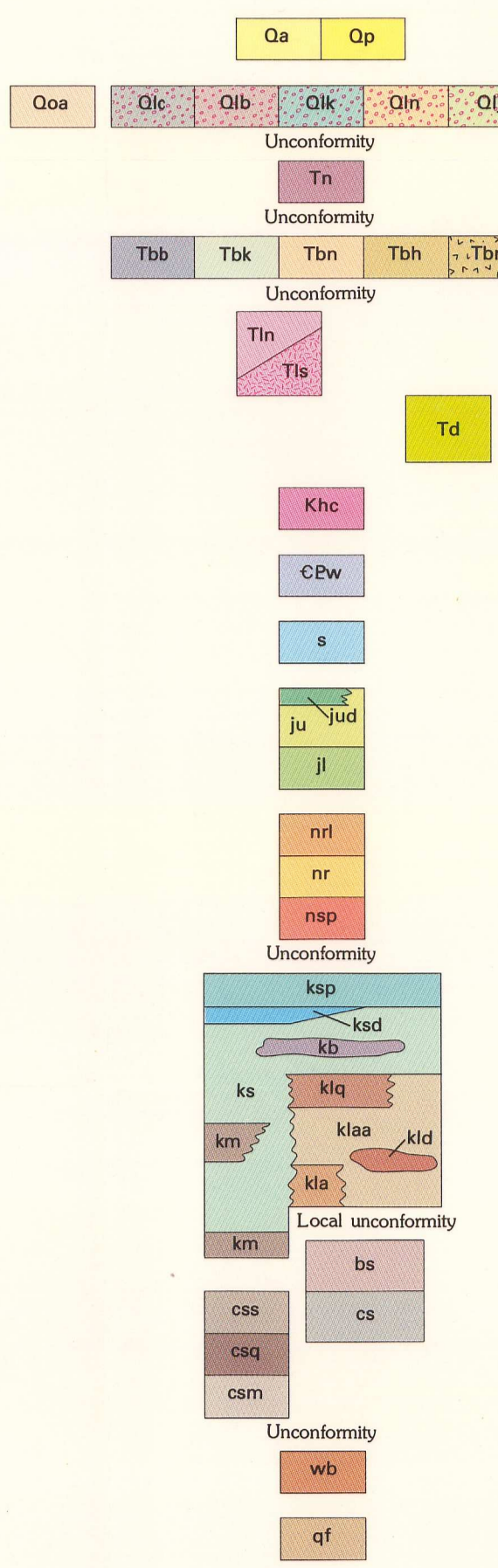


CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

- Qa** ALLUVIUM AND TALUS (Quaternary)
- Op** PLAYA LAKE DEPOSITS (Quaternary)
- Ooa** OLDER ALLUVIUM (Quaternary)—Uplifted and dissected alluvial gravel and sand
- Qlc** LANDSLIDE DEPOSITS (Quaternary)
- Qlb** Debris composed of Crystal Spring Formation
- Qln** Debris composed of Kingdon Peak Formation
- Qli** Debris composed of Noonday Dolomite
- Qlj** Debris composed of Johnnie Dolomite
- Ql** Deposits, undifferentiated—May be composed of debris of more than one source type

- Tn** NOVA FORMATION (Pliocene)—Named by Hopper (1947) for exposures in Nova Canyon (T. 18 S., R. 43 E.), the first large canyon south of Toome Pass road in Panamint Butte quadrangle, and assigned a Pliocene age by Hall (1971) on basis of K-Ar ages of interbedded basalt flows. Composed of gravel, sand, and silt; thin bed of limestone occurs at base.
- Tb** MONOLITHOLOGIC BRECCIA (Pliocene)—Consists of landslide deposits of greatly crushed and fragmented rock derived from older metamorphic and granitic rocks. Stratigraphic continuity of metamorphic rocks in slide masses is generally preserved. Divided into: Breccia composed of Beck Spring Dolomite; Breccia composed of Kingdon Peak Formation; Breccia composed of Noonday Dolomite; Breccia composed of granodiorite of Hall Canyon pluton; Breccia composed of interlayered and mixed granodiorite of Hall Canyon pluton and amphibolite.
- Td** LITTLE CHIEF STOCK (Miocene?)—Leucocratic hornblende-biotite granite porphyry containing phenocrysts of sanidine and complexly zoned plagioclase as large as 10 mm in diameter. Groundmass is composed of 0.5-mm grains of quartz, alkali feldspar, and minor plagioclase. Stock is a composite of a northern and a southern phase; northern phase has a slightly higher mafic mineral content (10 percent) than southern (5 percent) and has a chilled margin against southern phase. Emplacement of stock is described by McDowell (1974), and crystallization history is described by McDowell (1978). K-Ar age of 12 m.y. was measured on alkali feldspar from a boulder of northern phase of stock collected in Hanaupah Canyon in Bennetts Well quadrangle (Stern and others, 1966).
- Tin** Northern phase
- Tis** Southern phase
- Td** FELSIC SILLS AND DIKES (Miocene?)—Dikes and sills similar in composition to Little Chief stock, composed of quartz, microcline, and muscovite, locally, a minor amount of biotite and a trace of garnet are observed. In Wildrose Canyon, unit contains abundant microcline, and dominant rock type is granite.
- Khc** HALL CANYON PLUTON (Cretaceous)—Medium-grained leucocratic granodiorite consisting of sodic plagioclase, quartz, microcline, and muscovite, locally, a minor amount of biotite and a trace of garnet are observed. In Wildrose Canyon, unit contains abundant microcline, and dominant rock type is granite.
- Cw** WOOD CANYON FORMATION (Cambrian and Proterozoic)—Mostly thin-bedded siltstone and quartzite.
- s** STERLING QUARTZITE (Proterozoic)—Approximately 500 m of quartzite, siltstone, and silty dolomite in middle part, and mostly quartzite with minor siltstone and dolomite in upper part. Two purple argillite layers occur about 150 m above base and locally contain andalusite porphyroblasts.
- ju** JOHNNIE FORMATION (Proterozoic)
- ju** Upper member—700 m of argillite and calcareous argillite. Lower part consists of very thin bedded micaceous green argillite with rare sandy dolomite and limestone layers; upper part is characterized by thin-bedded blue-gray argillite and gray-green silty limestone. Sedimentary bedforms are abundant and include ripple marks, climbing ripples, and laser structure. Thin quartzite beds are common near top. Locally includes massive light-gray dolomite with minor thin argillite beds near top. In southeastern part of quadrangle, member contains tremolite-dolomite marble and andalusite-staurolite-biotite schist.
- ju** Lower member—Thick-bedded dolomite and sandy dolomite, interbedded with quartzite and dolomitic quartzite and overlain by dark reddish-brown weathering quartzite and pelitic thickness ranges from 150 to 300 m. More highly metamorphosed equivalent of member contains tremolite-dolomite marble and andalusite-staurolite-biotite schist.
- nr** NOONDAY DOLOMITE (Proterozoic)—Dominantly dolomite and dolomitic limestone. West of range crest, unit is metamorphosed and consists of marble.
- nr** Redlands Member—Originally named Redlands Dolomite Limestone by Murphy (1930, 1932) for exposures in Redlands Canyon to Manly Peak quadrangle. Unit is reddefined herein as member of Noonday Dolomite. 125 to 250 m of thick-bedded to massive light-gray dolomite with minor thin argillite beds near top. In southeastern part of quadrangle, member is dominantly calcic and consists of dolomitic sandstone, quartz-dolomite calcarenite, and quartzite.
- nr** Reddiff Member—Originally named Reddiff Formation by Murphy (1930, 1932), but derivation of name was not stated. Unit is reddefined herein as member of Noonday Dolomite. 100 to 250 m of thin-bedded gray, pink, green, or brown limestone interbedded with thin laminae of gray-green argillaceous limestone and argillite. Lower part consists almost entirely of argillite but includes lenses of conglomerate containing clasts of argillite and dolomite in argillaceous dolomite matrix.
- nsp** Sentinel Peak Member—Originally named Sentinel Dolomite by Murphy (1930, 1932). Renamed Sentinel Peak Member herein to avoid confusion with Sentinel Granodiorite of Yosemite National Park. Type locality is west bank of Sentinel Peak (T. 21 S., R. 45 E.) in Telescope Peak quadrangle. 3 to 150 m of light-gray massive dolomite containing thin bedded siliceous limestone in lower part. Thin laminae and tubular structures are common in member. In many places, member is too thin to be mapped separately.
- psp** PAHRUMP GROUP (Proterozoic)—Includes, in descending order, the Kingdon Peak, Beck Spring, and Crystal Spring Formations.
- ksp** KINGSTON PEAK FORMATION
- ksp** South Peak Member—Defined by Johnson (1957) for exposures near South Peak basin in northern part of Manly Peak quadrangle. Lower part consists of as much as 150 m of thin-bedded argillite. Locally, argillite has spotted appearance due to presence of altered cordierite porphyroblasts. Argillite is overlain by as much as 35 m of pebbly conglomerate consisting of quartzite clasts in black argillaceous matrix. Conglomerate is overlain by about 70 m of felspathic quartzite and as much as 30 m of pebbly argillite. These upper units are variably truncated by disconformity at base of Noonday Dolomite.
- ksd** Sourdough Limestone Member—Originally named by Murphy (1930, 1932) Sour Dough Limestone of Telescope Group; reddefined by Johnson (1957) as middle member of Kingdon Peak Formation. Spelling is changed here to conform with that of Sourdough Canyon (T. 21 S., R. 45 E.), its type locality in Telescope Peak quadrangle after which Murphy named member. 5 to 30 m of thinly laminated light and dark gray micaceous limestone. In places, slump folds occur at top of member and fold argillite of overlying South Peak Member into Sourdough Limestone Member. In most places, member is too thin to be mapped separately and is represented on map by contact between South Peak Member and Surprise Member of Kingdon Peak Formation.
- ks** Surprise Member—Originally defined as Surprise Formation by Murphy (1930, 1932); herein adopted as reddefined by Johnson (1957) as Surprise Member of Kingdon Peak Formation. Type locality of member is in upper part of Surprise Canyon (T. 21 S., R. 45 E.) in Telescope Peak quadrangle. Member contains 250 to 1,000 m of clastic rocks and, south of Surprise Canyon, consists of massive to unbedded tuffaceous to unsorted pebbly mudstone and diamicite. Largest clasts are generally smaller than 10 cm in diameter, but some clasts several meters across occur. Rock types of clasts include quartzofeldspathic gneiss, quartzite, dolomite, argillite, and diabase. Graded argillite beds that contain exotic cobbles also occur in member. North of Surprise Canyon, member consists of thin-bedded argillite and fine-grained metagraywacke. Diamicite is absent and conglomeratic layers are uncommon. Interbeds of thinly laminated gray siliceous marble occur in Judd and Tuber Canyons. Basalt and amphibolite with pillow structures are interbedded with member in upper Pleasant Canyon and along the west margin of range.
- kb** Pillow basalt and amphibolite
- km** Siliceous calcite marble
- ksa** Linslinkin Spring Member (new)—Named for Linslinkin Spring in Surprise Canyon. Type section is in vicinity of Linslinkin Spring (T. 21 S., R. 45 E.). Member intertongues with upper part of Beck Spring Dolomite but locally lies unconformably on top of Beck Spring Dolomite, Crystal Spring Formation, and older Proterozoic rocks. Member is overlain by Surprise Member of Kingdon Peak Formation. Thickness of member varies from 50 to 500 m. Member includes a variety of rock types but consists primarily of fine-grained metagraywacke, pelitic schist, and amphibolite schist. Conglomeratic layers are locally abundant and contain clasts of older Proterozoic basement, or clasts of Beck Spring Dolomite as much as several meters in diameter. Interbeds of dolomite lithologically similar to Beck Spring Dolomite are common in lower part, and in many places, member intertongues with Beck Spring Dolomite. North of Surprise Canyon, lower part of member also contains numerous interbeds of metamorphosed arkose and arkosic conglomerate. Top of member is marked by 60 to 100 m of thin-bedded calcareous quartzite and quartz arenite. Linslinkin Spring Member is divided into: Argillite, schist, amphibolite, and metamorphosed conglomerate; Dolomite—Only thick units are mapped; Arkose and arkosic conglomerate—Also contains interbeds of dolomite, dolomite-clast conglomerate, and gneiss-clast conglomerate.
- klq** Diabase and Amphibolite—Sills and dikes of metamorphosed mafic rock. May include rocks of different ages of intrusion.
- klk** Dolomite and calcareous quartzite
- klj** Quartzite—Only thick units are mapped
- kl** Arkose and arkosic conglomerate—Also contains interbeds of dolomite, dolomite-clast conglomerate, and gneiss-clast conglomerate.
- da** DIABASE AND AMPHIBOLITE—Sills and dikes of metamorphosed mafic rock. May include rocks of different ages of intrusion.
- ju** BECK SPRING DOLOMITE—Consists of 200 to 300 m of blue-gray to buff massive siliceous dolomite and its metamorphosed equivalent tremolite-dolomite marble. Originally named Marvel Dolomite Limestone by Murphy (1930, 1932) but correlated with Beck Spring Dolomite of Hewett (1940) by Albee and Lanphere (1962). Thin, wavy laminae and stromatolites are preserved on Sentinel Peak. Interbeds of intratransformal conglomerate and argillite occur where top of unit intertongues with clastic rocks of overlying Kingdon Peak Formation.
- cs** CRYSTAL SPRING FORMATION—Consists primarily of 200 to 300 m of marble and schist. Originally part of Panamint Metamorphic Complex of Murphy (1930, 1932) but correlated with Crystal Spring Formation of Hewett (1940) by Albee and Lanphere (1962). Quartzite-clast conglomerate occurs at base in upper Happy Canyon, where formation consists of dolomitic marble overlain by argillite. Elsewhere, dark-brown weathering micaceous calcite marble occurs at base, and upper part consists of biotite schist. In Tuber Canyon, formation is over 1,000 m thick and is divided into lower unit of marble, middle unit of quartzite interbedded with pelitic schist, and upper unit of garnet-chlorite schist interbedded with micaceous quartzite.
- csa** Garnet-chlorite-chloritoid and garnet-chlorite-biotite schist interbedded with micaceous quartzite
- csq** Micaceous quartzite
- csn** Marble—Dark-brown weathering, locally containing chert nodules
- wb** WORLD BEATER COMPLEX (Proterozoic)—Renamed by Lanphere and others (1964) from World Beater Porphyry of Murphy (1932). Unit is named after exposures in vicinity of World Beater mine on south side of Pleasant Canyon (T. 22 S., R. 45 E.). Unit consists of argon gneiss and granite that make up entire dome in Pleasant and Happy Canyons. Gray biotite argon gneiss (approximately 1,700 m); oak; Albee and others, 1964) is included by gray porphyritic granite (approximately 1,400 m); oak; Lanphere and others, 1964).
- qf** QUARTZOFELDSPATHIC GNEISS COMPLEX (Proterozoic)—Thickly foliated leucocratic quartz-plagioclase-microcline-muscovite gneiss. Compositional layering is parallel to foliation. Leucocratic gneiss overlies with apparent conformity a sequence of metamorphic rocks that consists dominantly of leucocratic quartz-rich schist and micaceous quartzite. Dark biotite-rich and amphibolite-rich layers are locally abundant.

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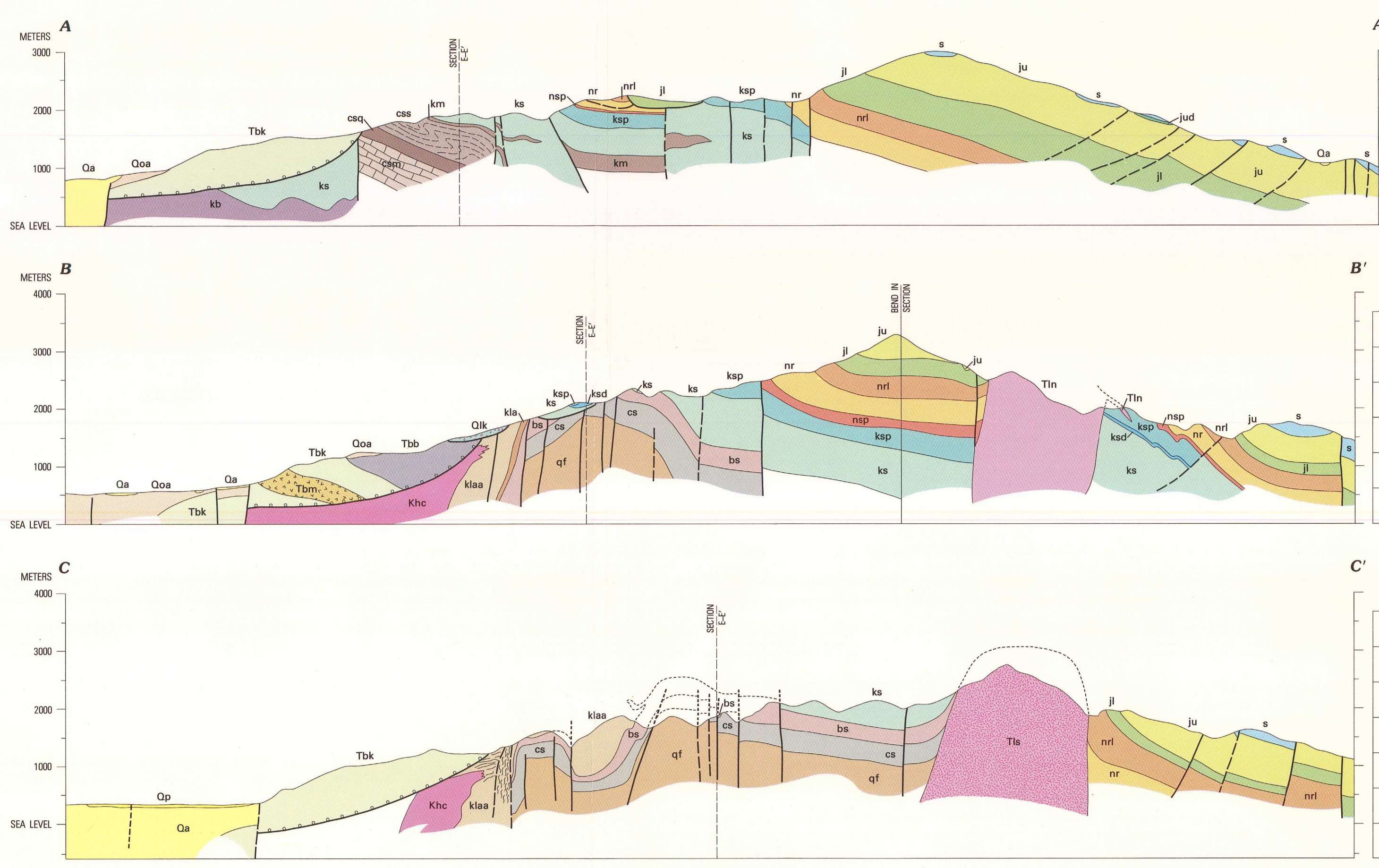
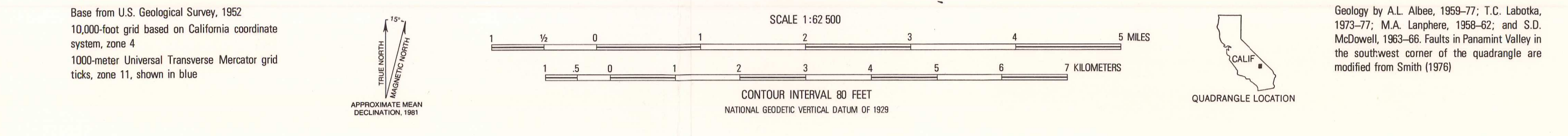
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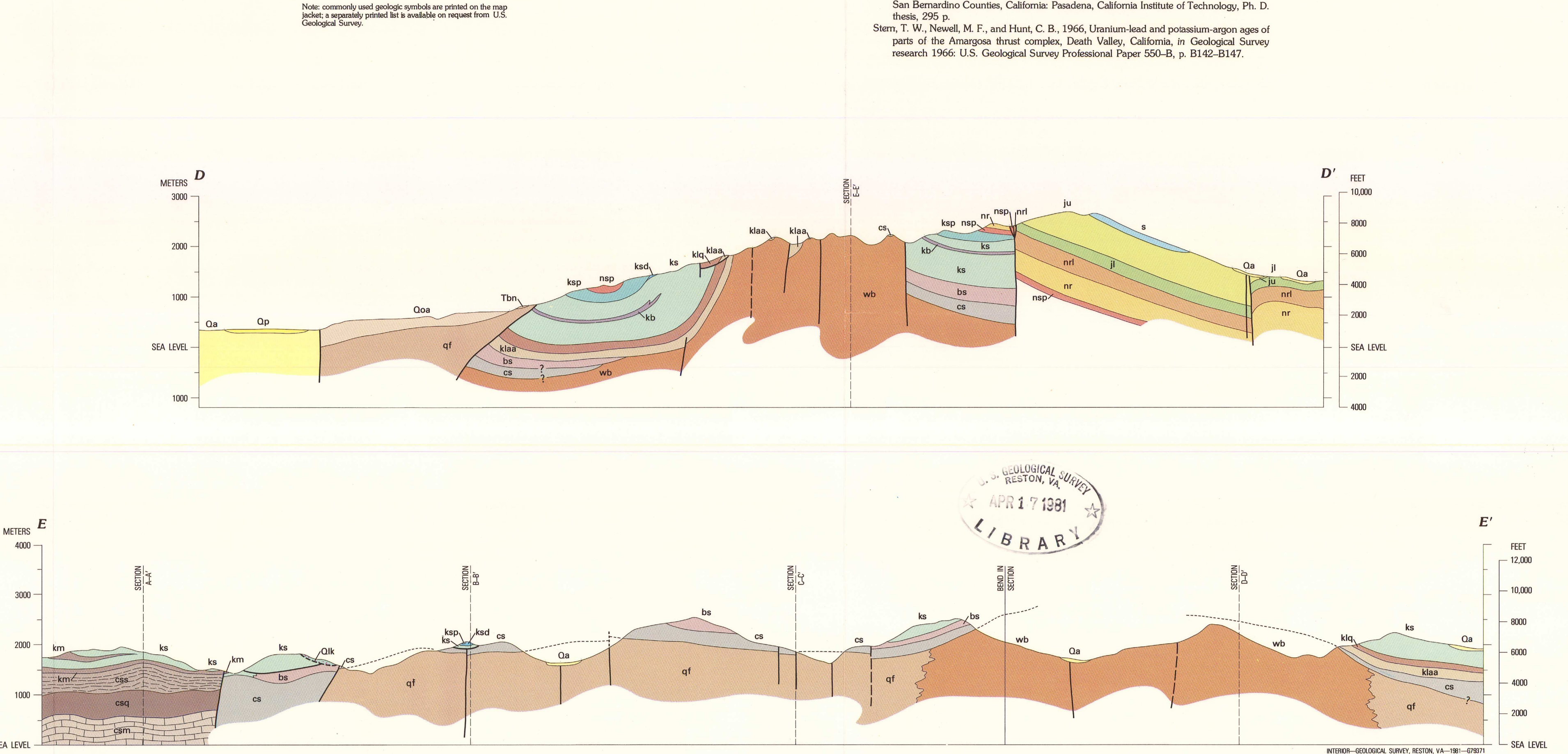
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- Contact between different clast lithologies within breccia and landslide deposits
- Lower boundary of monolithologic breccia, showing dip—Beads on downstream side; dashed where approximately located; dotted where concealed
- Fault, showing dip—Long dashed where approximately located; short dashed where inferred; dotted where concealed
- Low-angle normal fault—Hachured on downthrown side; dashed where approximately located; dotted where concealed
- Scarp in alluvium—Ball on lower side; short dashed where inferred; dotted where concealed
- Syncline—Approximately located, showing trace of axial surface and direction of plunge
- Minor fold axis—Showing plunge
- Strike and dip of axial plane and plunge of fold axis
- Zone of intense diastrophic folding
- Plunge of mineral or stretched cobble lamination
- Tertiary felsic dike swarm



GEOLOGIC MAP OF THE TELESCOPE PEAK QUADRANGLE, CALIFORNIA  
By  
A.L. Albee, T.C. Labotka, M.A. Lanphere, and S.D. McDowell  
1981