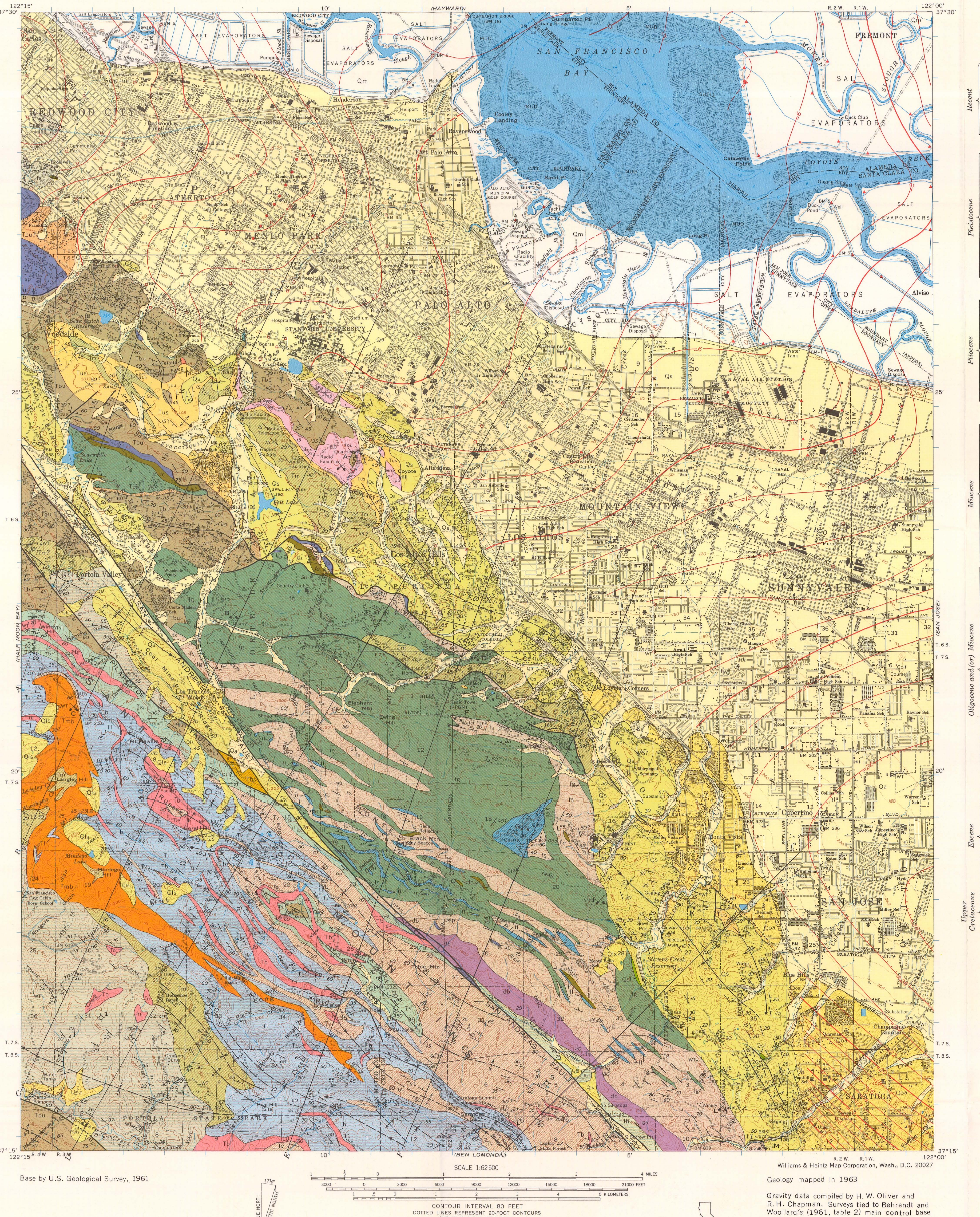
PREPARED IN COOPERATION WITH U. S. GEOLOGICAL SURVEY

MAP SHEET 8
DIVISION OF MINES AND GEOLOGY
Ferry Building, San Francisco
Ian Campbell, Chief
1966
State of California
The Resources Agency
Department of Conservation



Base by U.S. Geological Survey, 1961

Williams & Heintz Map Corporation, Wash., D.C. 20027

SCALE 1:62500

CONTOUR INTERVAL 80 FEET
DOTTED LINES REPRESENT 20-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL
DEPTH CURVES AND SOUNDINGS IN FEET—DATUM IS MEAN LOWER LOW WATER
SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER
THE MEAN RANGE OF TIDE IS APPROXIMATELY 7 FEET

APPROXIMATE MEAN DECLINATION, 1961

QUADRANGLE LOCATION

Geology mapped in 1963

Gravity data compiled by H. W. Oliver and R. H. Chapman. Surveys tied to Behrendt and Woollard's (1961, table 2) main control base at San Francisco airport. Data reduced according to Bouguer reduction procedures for density of 2.67 g per cm³ (Swick, 1942, p. 60–68)

EXPLANATION

QUATERNARY

Recent

Qa, Qm, Qls — Surficial sediments
Qa, *alluvium;*
Qm, *bay mud and clay;*
Qls, *landslide rubble*

UNCONFORMITY

Pleistocene

Qoa — Older alluvium

UNCONFORMITY

Qs, Qsl — Santa Clara Formation
Qs, *gravel;*
Qsl, *lake beds*

UNCONFORMITY

TERTIARY

Pliocene

Tme — Merced(?) Formation

UNCONFORMITY

Tp — Purisima Formation

UNCONFORMITY

Miocene

Tm — Monterey Shale

Tus — Unnamed sandstone

Tpb — Page Mill Basalt

Tmb — Mindego Basalt

Oligocene and (or) Miocene

Tb — Basalt and diabase

Tl — Lambert Shale

Tv — Vaqueros Sandstone

Tsl — San Lorenzo Formation

Eocene

Tbu, Tbs, Tbc — Butano Sandstone
Tbu, *sandstone;*
Tbs, *shale;*
Tbc, *basal conglomerate*

CRETACEOUS

Upper Cretaceous

sh — Unnamed shale

sp — Serpentine

db — Diabase

fs, fh, fl, fc, fg, fu — Franciscan Formation
fs, *sandstone or graywacke;*
fh, *shale;*
fl, *limestone;*
fc, *chert;*
fg, *greenstone;*
fu, *undivided rocks (Shown in sections only)*

Contact
Dashed where gradational or approximately located

U / D — Fault
Dashed where indefinite or of doubtful existence; dotted where concealed. U, upthrown side; D, downthrown side. Parallel arrows indicate relative lateral movement; single arrow indicates dip of fault plane

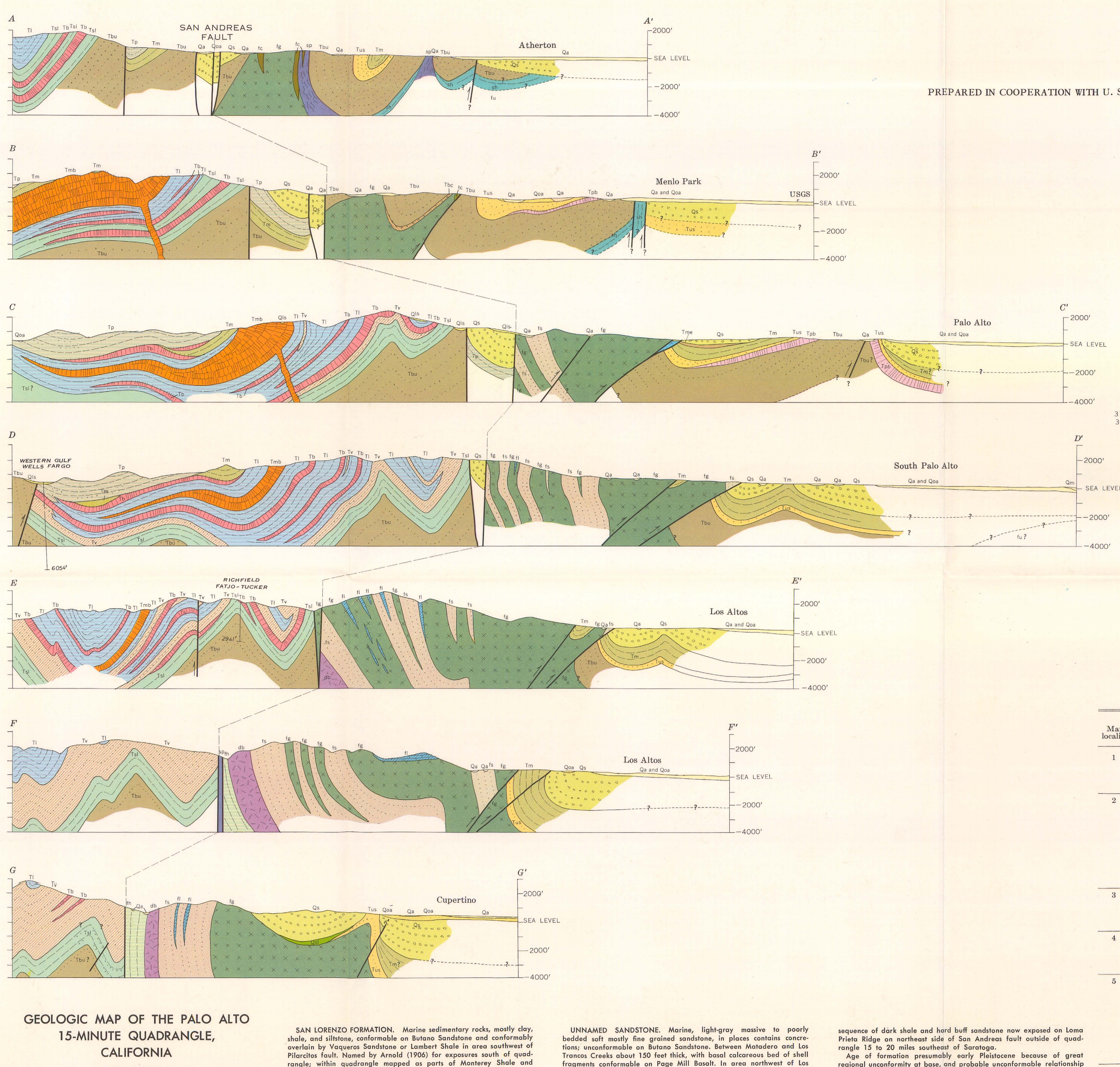
Anticline — Syncline
Fold, showing surface position of axis and direction of plunge
Dashed where approximately located

40 Inclined — Vertical — 70 Overturned
Strike and dip of beds

Gravity stations
○ *Taylor (1956, Appendix)*
□ *Greve and Clement (1963, 9000 series)*
▲ *R. H. Chapman* } *(written commun.)*
● *H. W. Oliver* }

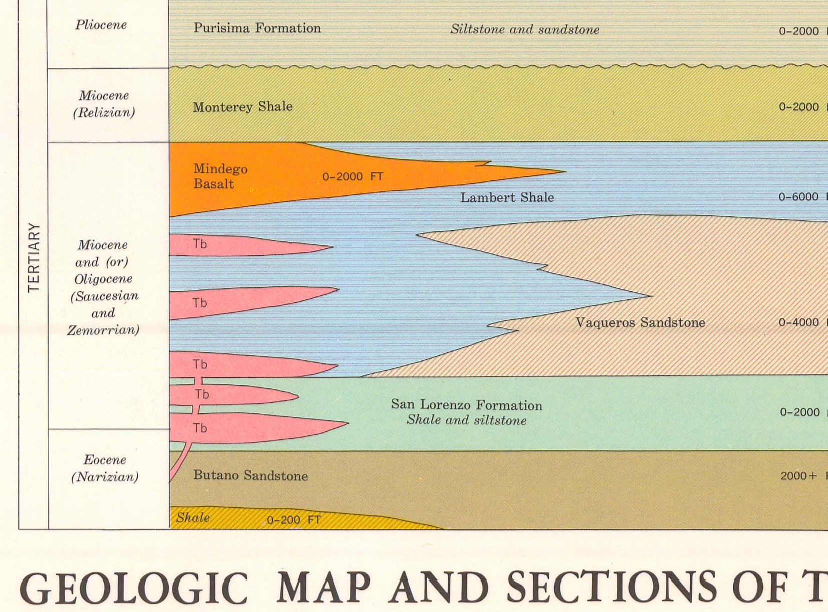
10, 8 — Bouguer gravity contours
Contour interval 2 milligals

Oil and gas test well, abandoned — Quarry — Gas seep

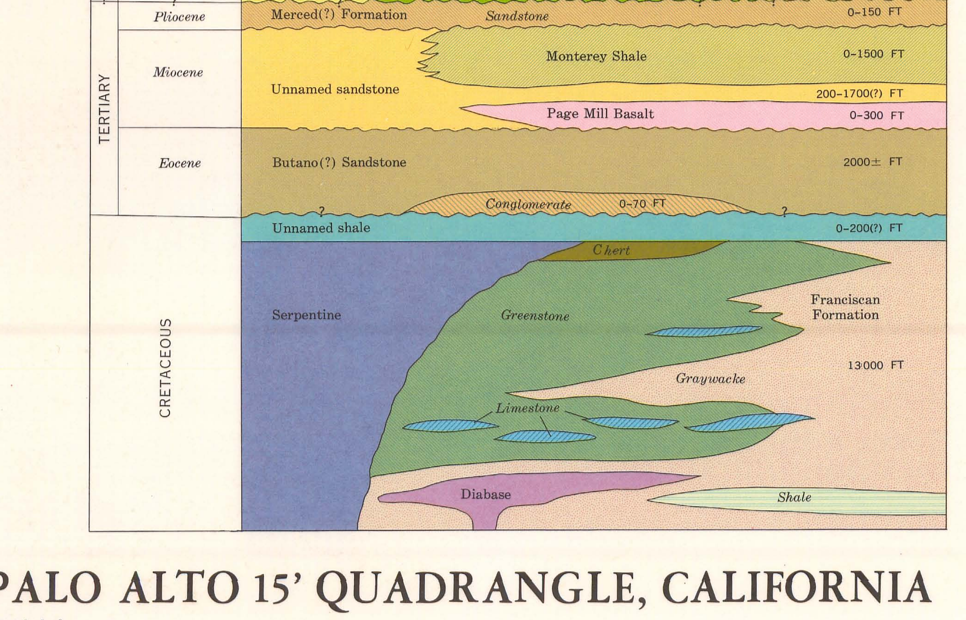


INDEX MAP

FORMATIONS SOUTHWEST OF SAN ANDREAS FAULT



FORMATIONS NORTHEAST OF SAN ANDREAS FAULT



GEOLOGIC MAP AND SECTIONS OF THE PALO ALTO 15' QUADRANGLE, CALIFORNIA

By T.W. Dibblee, Jr.

GEOLOGIC MAP OF THE PALO ALTO 15-MINUTE QUADRANGLE, CALIFORNIA

By T. W. DIBBLEE, JR.
U.S. Geological Survey, Menlo Park, Calif.

The Palo Alto quadrangle includes a segment of the northern Santa Cruz Mountains. The terrane rises to two parallel main ridges 1 mile to 2 miles apart that are separated by the San Andreas rift zone. The ridge to the southwest, followed by State Highway 5, has an even crest line at an altitude of about 2,000 feet. The ridge to the northeast, broken through by several main canyons from the rift zone, rises to a subdued crest with a high point of 2,810 feet at Black Mountain.

An old erosion surface is evident throughout the upland areas, but in the higher parts it is severely dissected by deep V-shaped canyons resulting from uplift in late Quaternary time. During that time, the valley area, in which sediments are accumulating and which is partly submerged, has been sinking.

ROCK UNITS

FRANCISCAN FORMATION. Sequence of intertonguing volcanic and unmetamorphosed marine sedimentary rocks, possibly as much as 13,000 feet thick, neither base nor top exposed. All rocks much shattered, in places brecciated or sheared. Age, Cretaceous, possibly in part Late Jurassic.

Sandstone or graywacke, greenish-gray, weathers buff, hard, massive, fine- to medium-grained, composed of grains of quartz, plagioclase, biotite, iron oxides, and other dark materials firmly cemented together.

Shale, dark-gray, bedded, hard, micaceous, argillaceous to silty.

Limestone (referred to as the Calera Limestone by Walker, 1950), blue-gray to white, hard, massive to bedded, very fine grained, composed of calcite, contains lenses of chert; limestone also forms lenses, largest is at Permanente quarry and is 380 feet thick; this lens and others 2 miles west contain early Late Cretaceous Foraminifera (Thalmann, 1942; Church, 1952) of the Cenomanian or early Turonian Stage (D. L. Jones, oral communication, 1964).

Chert, green, gray, brown, red, bedded to massive. In places veined or mottled to jasper.

Greenstone, greenish-black, weathers dark brown, forms reddish-brown soil, massive, in places amygdaloidal, or with pillow structure; includes greenstone breccia and tuff breccia; aphanitic, composed of plagioclase (albite), chlorite, pyroxene (augite), sphene, and iron oxides (Julius Schlocker, oral communication, 1963). Metamorphosed probably from submarine basalt flows and possibly from some basaltic intrusions.

DIABASE. Dark-gray, massive, fine- to coarse-grained diabasic in texture; composed of 50 to 60 percent lathy plagioclase (andesine, An₅₇), 40 to 50 percent pyroxene (augite, mostly altered to hornblende and chlorite), magnetite, ilmenite, and leucoxene (Branner, Newsom, and Arnold, 1909); forms sill as thick as 1,500 feet in Franciscan Formation. Age, presumably Cretaceous.

SERPENTINE. Greenish-black to bluish-green, massive, slickensided, composed of antigorite, specks of magnetite, and minute veinlets of chrysotile asbestos; forms sill-like intrusions in Franciscan Formation. Age, presumably Cretaceous.

UNNAMED SHALE. Marine clay shale, dark-gray, micaceous, nodular; thickness unknown, only top 50 feet exposed; contains Late Cretaceous (Campanian) Cephalopoda and Foraminifera (Graham and Church, 1963).

BUTANO SANDSTONE. Marine sedimentary rocks, mostly sandstone, of Eocene age. In area south of Pescadero Creek named and formerly assigned to Oligocene Epoch; in areas west and south of Portola Valley mapped as Vaqueros Sandstone; and in areas northeast of San Andreas fault mapped as Chico Formation (Upper Cretaceous) by Branner, Newsom, and Arnold (1909). Composed of following rock units:

Conglomerate, gray, composed of cobbles and pebbles of pre-Tertiary rhyolitic and andesitic porphyry and felsite, quartzite, and granitic rocks, in buff arkosic sandstone matrix; forms lenses as thick as 30 feet intercalated in basal 70 feet of Butano Sandstone north of Portola Valley; unconformable on Franciscan Formation.

Shale, questionably assigned to Butano Formation; greenish-gray, micaceous, nodular, severely sheared, about 200 feet exposed only in Pilarcitos fault zone at head of Corte Madera Creek; contains prolific foraminiferal fauna of undetermined Paleocene or Eocene age (Cummings, Touring, and Brabb, 1960, p. 184), but suggesting middle Eocene (Cummings, 1960).

Sandstone, in areas southwest of Pilarcitos fault, light gray, weathers buff, bedded, hard, fine- to medium-grained, arkosic, contains interbeds of micaceous siltstone; formation many thousands of feet thick, but only uppermost 2,000 feet exposed within quadrangle; gradational upward into shale of San Lorenzo Formation. In areas northeast of Pilarcitos and San Andreas faults, rocks are lithologically similar, but much of sandstone is massive. About 2,500 feet in exposed thickness northeast of San Andreas fault, unconformity at base where underlain by Franciscan Formation. In areas on both sides of San Andreas fault, molluscan fossils rare; contains Foraminifera of late Eocene (Narizian) age, but northeast of fault some may be as old as middle or early Eocene age (Cummings, Touring, and Brabb, 1962, p. 186; Graham and Classen, 1955).

SAN LORENZO FORMATION. Marine sedimentary rocks, mostly clay, shale, and siltstone, conformable on Butano Sandstone and conformably overlain by Vaqueros Sandstone or Lambert Shale in area southwest of Pilarcitos fault. Named by Arnold (1906) for exposures south of quadrangle; within quadrangle mapped as parts of Monterey Shale and Vaqueros Sandstone by Branner, Newsom, and Arnold (1909), but as San Lorenzo Formation by Cummings, Touring, and Brabb (1962, p. 186–189, pl. 20). Within quadrangle, formation is from 700 to 2,000 feet thick; lower third, bedded, platy to spheroidal fracturing, dark gray, micaceous clay shale and siltstone, in places with thin interbeds of buff fine-grained arkosic sandstone; upper two-thirds bedded to massive, commonly with concretions, in places contains lenses of light buff arkosic sandstone. Grades upward through interbeds into Vaqueros Sandstone. Lower third contains Foraminifera of late Eocene (Narizian) age; upper two-thirds Foraminifera of late Eocene and Oligocene (Refugian), and Oligocene (Zemorrian) ages (Brabb, 1964, p. 674).

VAQUEROS SANDSTONE. Marine sandstone, referred to Vaqueros Sandstone (type section 80 miles southeast of quadrangle) by Arnold (1906), Branner, Newsom, and Arnold (1909), and Cummings, Touring, and Brabb (1962, p. 188–189, pl. 20). Conformably overlies San Lorenzo Formation in area southwest of Pilarcitos fault. In Saratoga Gap area Vaqueros Sandstone nearly 4,000 feet thick, overlain conformably by upper part of Lambert Shale; northwestward thins rapidly and intertongues into Lambert Shale below Mindego Basalt; disappears entirely in area north of Woodruff Creek. Vaqueros Sandstone light gray, weathers buff, semifriable to hard, bedded to massive, fine, medium to locally coarse grained, arkosic, in places contains concretions. Commonly contains minor amounts of interbedded gray micaceous siltstone and silty mudstone. Contains rare molluscan fossils and meager foraminiferal faunas of Oligocene(?) (Zemorrian) age (Cummings, Touring, and Brabb, 1962, p. 189). According to Weaver and others (1944, Chart 11), the Zemorrian Stage is "Oligo-Miocene" in age.

LAMBERT SHALE. Marine shale conformable on Vaqueros Sandstone, or San Lorenzo Formation where Vaqueros Sandstone is absent, and overlain by Monterey Shale, in area southwest of Pilarcitos fault. Mapped as Monterey Shale by Branner, Newsom, and Arnold (1909); as parts of San Lorenzo and Vaqueros Formations and Sandholdt Formation by Cummings (1960), and as parts of San Lorenzo, Vaqueros, and Mindego Formations by Cummings, Touring, and Brabb (1962, pl. 20). Herein named after Lambert Creek. Type section designated as that exposed from top of Vaqueros Sandstone (in NW¼ sec. 27, T. 7 S., R. 3 W.) in Lambert Creek southwest down Lambert and Peters Creeks to base of Monterey Shale (in NW¼ sec. 33, T. 7 S., R. 3 W.) in Peters Creek. Formation at type section about 4,800 feet thick, exclusive of basaltic rocks mapped separately. Lower 2,750 feet from base of formation to upper tongue of Mindego Basalt composed of moderately to indistinctly bedded, gray, spheroidally weathering clay shale and siltstone, commonly with calcareous concretions and lenses, a few lenses of dark brown harder semisiliceous shale that weathers whitish, and occasional thin sandstone lenses. Upper part, from upper tongue of Mindego Basalt to top of formation, similar but includes more semisiliceous shale and much dark brown hard semisiliceous mudstone that weathers chalky white; gradational(?) upward into more platy siliceous shale of Monterey Shale. Lithology of Lambert Shale elsewhere generally similar to that of type section. Southeastward, lower part intertongues into Vaqueros Sandstone; northwestward, part below Mindego Basalt thins to about 1,500 feet; part above Mindego Basalt becomes overlapped by Monterey Shale and Purisima Formation. Lambert Shale contains foraminiferal faunas of Zemorrian and Saucesian ages, according to faunas collected from localities within it (Cummings, 1960). These stages are considered by Weaver and others, (1944, Chart 11) to be "Oligo-Miocene" in age.

BASALT AND DIABASE. Black, massive, rarely vesicular, fine- to medium-grained, composed of calcic plagioclase, augite, olivine, magnetite, analcite, palagonitic glass, and secondary minerals (antigorite, chlorite, iron oxides, calcite). Forms isolated flows and (or) sills as thick as 400 feet, mostly in San Lorenzo Formation and Lambert Shale.

MINDEGO BASALT. Predominantly extrusive basaltic rocks that form Langley and Mindego Hills; type section in La Honda Canyon at La Honda just west of quadrangle, same as that for Mindego Formation of Cummings, Touring, and Brabb (1962, p. 189–198), but unit is herein redesignated Mindego Basalt, and restricted to single area of basaltic rocks mappable continuous with type section. Mindego Basalt about 2,000 feet thick both at type section and along Mindego Creek, lenses out southeastward into Lambert Shale. Composition of Mindego Basalt same as that of basalt and diabase unit described above, but Mindego Basalt occurs as submarine flows, flow breccias, agglomerates, and tuff breccias; in places contains a few small lenses a few feet thick of tuffaceous sandstone, limestone, and shale, as well as small intrusions(?) of basalt. Age, Zemorrian or Saucesian "Oligo-Miocene" (Weaver and others, 1944, Chart 11).

PAGE MILL BASALT. Extrusive basalt at or just above base of unnamed sandstone; herein named after old Page Mill quarry (A on map) by Matadero Creek 2 miles south-southeast of Stanford University; type section from base of basalt at lower old Page Mill quarry south up Page Mill Road to top of basalt about 2,200 feet from quarry. At type section basalt about 160 feet thick, underlain by a few feet of fine-grained unnamed sandstone that rests unconformably on Butano(?) Sandstone. Basalt black, hard, very fine grained, massive, vesicular, with vesicles flattened somewhat parallel to top and base of basalt; basalt composed mainly of calcic plagioclase, pyroxene, and iron oxides; age, same as that of lower part of unnamed sandstone, early or middle Miocene.

UNNAMED SANDSTONE. Marine, light-gray massive to poorly bedded soft mostly fine grained sandstone, in places contains concretions; unconformable on Butano Sandstone. Between Matadero and Los Trancos Creeks about 150 feet thick, with basal calcareous bed of shell fragments conformable on Page Mill Basalt. In area northwest of Los Trancos Creek possibly 1,300 feet thick where unit includes sandstone that grades (?) laterally southeastward into Monterey Shale. Contains meager early or middle Miocene molluscan fauna, except south of Stevens Creek where fauna suggests late(?) Miocene age (W. O. Addicott, oral communication, 1963). Presumably correlative with some part of Vaqueros Sandstone, Lambert Shale, or Mindego Basalt; and in part with Monterey Shale.

MONTEREY SHALE. Marine semisiliceous shale. In area southwest of Pilarcitos fault, shale named and mapped as Woodhams Shale Member by Cummings, Touring, and Brabb (1960, p. 194–195, pl. 20) overlies Lambert Shale, in places unconformably; Monterey Shale about 2,000 feet thick; dark brown but bleaches to nearly white at surface; ranges from soft fissile diatomaceous clay shale through indistinctly bedded diatomaceous mudstone or siltstone, to hard platy semisiliceous shale; in places contains thin hard calcareous beds, especially near base on Langley Hill; contains middle Miocene (Relizian and Luisian) foraminiferal faunas (Cummings, Touring, and Brabb, 1962, p. 195). In area between Pilarcitos and San Andreas faults, shale of similar lithology and about 1,700 feet thick; contains middle(?) Miocene foraminiferal fauna (P. J. Smith, oral communication, 1962). In areas northeast of San Andreas fault (referred to Purisima Formation by Branner, Newsom, and Arnold, 1909) about 2,000 feet thick and mostly thin-bedded semisiliceous chalky shale and siltstone in area south of Los Altos; but northwest from Adobe Creek mostly gray clay shale and siltstone, in places finely sandy or tuffaceous; eventually grades(?) laterally into fine-grained sandstone mapped with unnamed sandstone northwest of Los Trancos Creek; south of Los Altos contains middle Miocene (Relizian) foraminiferal fauna (Cummings, Touring, and Brabb, 1962, p. 195); but elsewhere faunas meager and undiagnostic; one in Adobe Creek suggests late Zemorrian(?) age; one in Matadero Creek late Miocene or early Pliocene (Delmontian?) age, and one in San Francisquito Creek middle Miocene (Luisian?) age.

PURISIMA FORMATION. Marine sandstone and siltstone unconformable on Miocene formations in areas southwest of San Andreas fault. First mapped by Branner, Newsom, and Arnold (1909) with type section in Purisima Canyon west of quadrangle. Mapped as Tahana Member, lowest of five members of their Purisima Formation, and assigned to lower Pliocene, by Cummings, Touring, and Brabb (1962, p. 197–200, pl. 20, 23). In Pescadero Creek area mostly massive light gray siltstone, locally diatomaceous, chalky weathering, and some interbedded light gray soft fine-grained sandstone, only lowest 2,000 feet of sequence exposed in quadrangle. In area northeast of Pilarcitos fault, poorly bedded, light brownish-gray fossiliferous, soft, fine-grained sandstone and sandy siltstone; about 2,000 feet thick.

MERCED(?) FORMATION. Soft yellow fine- to medium-grained sandstone with abundant shallow marine molluscan fossils; less than 150 feet thick, exposed only at two places west of Matadero Creek; unconformity at base. Age, late Pliocene (W. O. Addicott, oral communication, 1963).

SANTA CLARA FORMATION. Terrestrial sedimentary rocks, weakly consolidated. Named by Cooper (1894), first mapped by Branner, Newsom, and Arnold (1909) and assigned by them a Pliocene and Pleistocene age; no type locality designated. Type area hereby designated as exposures between Saratoga and Stevens Creeks, with type section as that exposed in Stevens Creek from base of formation in contact with Franciscan Formation one-fourth mile west of SE corner sec. 28, T. 7 N., R. 2 W. (about 1 mile south of Stevens Creek dam) north along west side of Stevens Creek reservoir to axis of syncline one-fourth mile north of SW corner sec. 22, T. 7 N., R. 2 W., (about one-third mile north of Stevens Creek dam). About 2,200 feet of formation exposed in type area. At type section lowest 70 feet composed of lacustrine clay and sandstone; remaining 2,000 feet composed of stream-laid conglomerate and interbedded sandstone, siltstone, and clay. Top of formation eroded at type section, but exposed 2 miles southeast in foothills within 1 mile northwest of Saratoga where formation dips steeply under unit mapped as older alluvium.

Northeast of San Andreas fault, formation rests with profound unconformity on Franciscan Formation and Tertiary formations, except unconformable relation to Merced(?) Formation near Matadero Creek uncertain. Formation throughout these areas mostly gray to olive-brown conglomerate or gravel composed of subrounded pebbles and cobbles derived from Franciscan Formation to southwest, in matrix of soft gritty sandstone or siltstone. Interbedded in lesser amounts are olive-gray to buff, soft, fine- to coarse-grained sandstone, greenish-gray to brown, gritty, soft siltstone and clay. In a few places lignite coal occurs as layers less than 1 inch thick in siltstone.

Lake beds, as thick as 150 feet at base of type section in Stevens Creek, and partly exposed 2 miles southeast in Calabasas Creek; composed of bedded light gray clay and buff soft sandstone that contains abundant fresh water minute molluscan fossils.

Santa Clara Formation in exposures southwest of San Andreas fault as thick as 2,000 feet in Corte Madera Canyon and unconformable on Purisima Formation; and on Miocene formations farther south. Formation similar to that exposed northeast of San Andreas fault, but contains, in addition to Franciscan detritus, clasts, some of boulder size, of conglomerate with cobbles of rhyolitic porphyry, granitic rocks, and quartzite imbedded in hard buff sandstone matrix. These clasts may have been derived from the thick conglomerates in the Upper Cretaceous sequence of dark shale and hard buff sandstone now exposed on Loma Prieta Ridge on northeast side of San Andreas fault outside of quadrangle 15 to 20 miles southeast of Saratoga.

Age of formation presumably early Pleistocene because of great regional unconformity at base, and probable unconformable relationship to Merced(?) Formation; possibly in part late Pliocene.

OLDER ALLUVIUM. Stream-laid gravel composed of cobbles and pebbles in matrix of light brown to reddish-brown sand and silt, derived from adjacent hills. Generally undeformed; dissected where elevated; unconformity at base in foothills and in canyons; as much as 50 feet exposed; presumably underlies alluvium in Santa Clara Valley, with thickness unknown. Age, presumably late Pleistocene.

SURFICIAL SEDIMENTS. Undissected, unconsolidated fill of Santa Clara Valley and canyon flood plains; maximum thickness presumably about 200 feet. Age, Recent, possibly in part latest Pleistocene.

Alluvium, stream-laid gravel, sand, and silt.

Bay mud and clay, brackish marine, gray to nearly black, commonly alkaline, in places with small molluscan fossils.

Landslide rubble, rubble slumped from ground upslope.

STRUCTURE

The very thick rock sequences exposed in the Santa Cruz Mountains and foothills are severely compressed into complex structures. These presumably are the effect of right-lateral drag movement on the San Andreas and Pilarcitos faults combined with intense pressure of one block against the other. This effect is indicated by the pattern of tightly squeezed folds, the axes of which trend slightly more west than do the two faults.

The San Andreas fault probably was active throughout Cenozoic time and is still highly active. This is indicated by recently formed scarps and trenches along it and offset small ridges and stream channels that cross it. These features indicate right-lateral movement, the southwest block having shifted northwestward relative to the northeast block. During the 1906 earthquake, there is said to have been a shift of about 10 feet or more along this segment. The amount of lateral shifting since deposition of the Santa Clara Formation may have been as much as 25 miles, because fragments of hard conglomerate (Upper Cretaceous?) and Franciscan detritus that make up the gravels of this formation west of the fault may have been derived from exposures of these rocks at that time directly across east of the fault. The nearest present outcrop of such rocks east of the fault is some 25 miles southeast, on Loma Prieta ridge, southeast of the quadrangle (see Santa Clara Formation).

The Pilarcitos fault, which branches northwest from the San Andreas at Stevens Creek, is believed to be inactive, because of its lack of physiographic expression. Displacement is up on the southwest, and presumably right lateral as suggested by the more easterly trend of a drag fold, the syncline axis between the Pilarcitos and San Andreas fault.

The total amount of cumulative right-lateral shifting along the San Andreas and Pilarcitos faults combined is not definitely known but may be great, because the basement rock that underlies the Tertiary formations is different on opposite sides. Northeast of the San Andreas fault it is the Franciscan Formation; but southwest of the Pilarcitos fault it is the granitic-metamorphic complex exposed west and south of this quadrangle. Between the San Andreas and Pilarcitos faults it is the Franciscan Formation exposed west of the quadrangle. The sequence of formations from the Franciscan to the top of the Monterey Shale on this intervening block is similar to that northeast of the San Andreas fault; but from the base of the Purisima upward it is more like the block southwest of the Pilarcitos fault. These relations suggest that the three blocks may have been shifted to their present positions from areas once far apart, the main shift being along the Pilarcitos fault prior to deposition of the Purisima Formation, and along the San Andreas fault since that time.

The Franciscan Formation of the Black Mountain-Monte Bello Ridge area was uplifted on two major low-dipping thrust faults which may be active. The Cenozoic formations of the foothills north and east of this upthrust mass of Franciscan rocks are severely deformed into folds with axes that trend northwest parallel to the thrust faults.

The alluviated valley area is filled with Quaternary sediments, including the Santa Clara Formation, that presumably are undeformed. The gravity data shown suggest that the crest of a buried ridge of high-density material (presumably the Franciscan Formation) extends southeastward from Redwood City under Palo Alto and Moffett Field, becoming more deeply buried southeastward; and to the south the axis of a basin filled with low-density material (presumably Cenozoic formations) extends southeastward from Los Altos Hills to a low center 3 miles southeast of Cupertino.

Publication authorized by the Director, U. S. Geological Survey.

EXPLORATORY TEST WELLS DRILLED FOR OIL OR GAS

Map locality	Company, number of well, and year drilled	Coordinates and altitude (in ft)	Footage and depth (in ft)	Formation symbol	Lithology and remarks
1	Union Oil Company of California, Moore no. 1 1956	326 south, 1,670 west of NE cor. sec. 31, T. 7 S., R. 3 W. alt. 892	0– 300 300– 2,960 2,960– 3,250 3,250– 4,350 4,350– 6,027	Tp Tb Tv Tsl Tbu	 Mostly basalt. Sandstone. Shale. Sandstone and shale.
2	Western Gulf Oil Company, Wells Fargo no. 1 1956	735 south, 2,215 east of NW cor. sec. 7, T. 8 S., R. 3 W. alt. 575	0– 300 300– 835 835– 950 950– 1,390 1,390– 2,560 2,560– 3,848 3,848– 6,057	Tp Tp Tv Tb Tv Tsl Tbu	Sandstone. Siltstone. Sandstone and shale. Basalt. Sandstone. Shale. Lower Saucesian-Zemorrian forams above 3,725 ft, Eocene forams below. Sandstone. Hole no. 2 drilled to 930 ft near same location.
3	Richfield Oil Corp., Fatjo-Tucker no. 1 1956	1,900 north, 2,795 west of SE cor. sec. 26, T. 7 S., R. 3 W. alt. 2,130	0– 872 872– 2,941	Tsl Tbu	Shale and fine-grained sandstone. Hard, fine-grained sandstone and siltstone, 48°–65° dips; oil shows above 887 ft.
4	Ajax Oil and Development Company Michele no. 1 1957	550 north, 550 east of W¼ cor. sec. 35, T. 7 S., R. 3 W. alt. 2,220	0– 330 330– 1,110 1,110– 1,240 1,240– 1,720 1,720– 2,695	Tv Tsl Tb Tsl Tbu?	Sandstone. Shale. Diabase. Shale. Shale and sandstone.
5	The Texas Company, Hayward no. 1 1953	2,600 north, 3,450 west of SE cor. sec. 5, T. 8 S., R. 2 W. alt. 1,801	0– 3,500 3,500– 3,860 3,860– 4,313	Tv Tv or Tsl Tsl or Tbu and Tbs	Sandstone and shale, 45°–50° dips; lower Saucesian-Zemorrian forams below 1,980 ft. Sandstone and shale. 80° dip at 3,827 ft. Lower Saucesian-Zemorrian forams. Eocene forams.

QUARRIES

Map locality	Name	Rock quarried (for road material, unless otherwise indicated)	Remarks
A	Old Page Mill	Tpb, basalt	Inactive
B	New Page Mill	fg, greenstone	Very large, active
C	Skyline Ridge	Tmb, basalt	Abandoned
D	Adobe Creek	fg, greenstone	Small, active
E	Los Altos	fg, greenstone	Large, active
F	Unnamed	fc, chert	Small, inactive
G	Permanente (Kaiser Cement & Gypsum Corp)	fl, limestone	Very large, active. Since 1939 used for cement. Prior to 1939 for road material, source of lime, for refining sugar
H	Unnamed	fg, greenstone	Small, inactive
J	Stevens Creek	Qs, gravel	Large, inactive
K	Santa Clara gravel	Qs, gravel	Large, inactive
L	Pierce Road	fs, sandstone	Inactive
M	Saratoga Creek	fs, sandstone	Large, active

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