

COLUMNAR SECTION

GENERALIZED SECTION OF THE SEDIMENTARY ROCKS OF THE SAN FRANCISCO DISTRICT.
SCALE: 1 INCH=2000 FEET.

SYSTEM.	SUBSYSTEM.	GROUP.	FORMATION.	SYMBOL.	COLUMNAR SECTION	AVERAGE THICKNESS IN FEET.	CHARACTER OF ROCKS.	EQUIVALENTS IN SANTA CRUZ QUADRANGLE AND REMARKS.		
QUATERNARY	RECENT		Temescal formation.	Qtc		20+	Mixed clay, sand, and angular fragments, with some gravel.	Alluvium.		
			Merritt sand.	Qm		30+	Marine sand.			
	PLEISTOCENE		San Antonio formation.	Qsa		150+	Clay, sand, and angular fragments, composing coarse alluvial fans.			
			Alameda formation.	Qa		130+	Marine sand and clay, with intercalated fluvial gravel and clay.			
			Campus formation.	Qc		600+	Fluvial gravel, lacustrine clay and limestone, andesitic and basaltic lava, and rhyolite tuff and agglomerate.			
			Bald Peak basalt.	Tbp		400+	Lava flows with some lenses of fresh-water limestone.			
			Siesta formation.	Tst		200	Fresh-water clay, sandstone, conglomerate, limestone, chert, lignite, and tuff.			
			Moraga formation.	Tm		1200	Andesite and basalt flows, tuff, fresh-water conglomerate, and cherty limestone.			
	PLIOCENE		Merced formation (marine) and contemporaneous fresh-water Orinda formation.	Tmc Tor		500- 5800	Merced formation, 5800 feet of marine clay, sandstone, conglomerate, shell beds, and beds of tuff. Orinda formation, about 6000 feet of fresh-water conglomerate, sandstone, clay, and limestone, with a few beds of tuff.	Merced and Purisima formations. Note.—Only the Orinda formation is interstratified with Pinole tuff and Moraga formation and is therefore represented in the graphic columnar section. The Merced formation lies in a separate depression.		
			Pinole tuff; also Northbrae rhyolite and Leona rhyolite of uncertain age.	Tp		1000	White andesitic pumiceous tuff, containing shells of fresh-water mollusks, interbedded with basal beds of Orinda formation.	Note.—Northbrae rhyolite lava, 100 feet thick, and the pyritic Leona rhyolite lava, about 500 feet thick, may possibly be contemporaneous with Pinole tuff.		
			San Pablo formation.	Tsp		1700	Sandstone, in large part light blue, shale, and some tuff.	Santa Margarita formation.		
			Basaltic flows.	Tlb		100+	Lava flows with associated intrusive basalt in southern part of San Mateo quadrangle only.	Diabase and basalt.		
			Briones sandstone with Hercules shale member near middle.	Tb Thl		2300	Sandstone, including bituminous shale member 500 feet thick.			
			Rodeo shale.	Tr		670	Chalky bituminous shale, slightly ferruginous and locally cherty.	Monterey shale. Vaqueros sandstone.		
		Hambre sandstone.	Th		1200	Sandstone and sandy shale, slightly ferruginous.	Note.—The bituminous shale formations of the Monterey group are made up in large part of microscopic organisms, chiefly diatoms, but the group contains also admixtures and beds of volcanic ash.			
		Tice shale.	Tt		460	Prevalingly chalky cream-colored bituminous shale.				
		Oursan sandstone.	To		600	Fine-grained sandstone.				
		Claremont shale.	Tc		800	Bituminous shale and alternations of shale and chert with lenses of limestone and a few beds of sandstone.				
TERTIARY	MIOCENE		Sobrate sandstone.	Ts		400	Fine-grained, light-colored, locally ferruginous sandstone.			
			Tejon formation.	Ttj		2000+	Hard, slightly ferruginous, light-colored to reddish sandstone, calcareous sandstone, and shale.	Represented by limestone inclusions in diabase.		
			Martinez formation.	Tmz		2000+	Sandstone with some glauconitic layers and shale.			
			Chico formation.	Kc		2000- 6000	Sandstone and shale.	Chico formation.		
			Oakland conglomerate member.	Ko		1000+	Conglomerate, 1000 feet thick.			
			Knoxville formation.	Kk		1000+	Shale and sandstone with some thin beds of limestone.	Knoxville formation.		
		CRETACEOUS	UPPER CRETACEOUS		Bonita sandstone.	Jbt		1400	Fine-grained gray sandstone with flakes of carbonaceous matter and thin seams of coal.	
					Ingleside chert.	Ji		530	Rhythmically stratified, reddish radiolarian chert and shale.	
					Marin sandstone.	Jm		1000	Massive dark-gray sandstone, obscurely stratified.	
					Sausalito chert.	Js		900	Rhythmically stratified, reddish radiolarian chert and shale.	
	Cahill sandstone.			Jch		2560	Prevalingly massive, obscurely bedded sandstone, with some shale, limestone, and conglomerate.			
	Calera limestone member.			Jca			Foraminiferal limestone, with lenses of chert, 60 feet thick.			
JURASSIC?	FRANCISCAN		Quartz diorite and included masses of Gavilan limestone.	qd			Medium-coarse quartz diorite with inclusions of limestone.	Quartz diorite.		

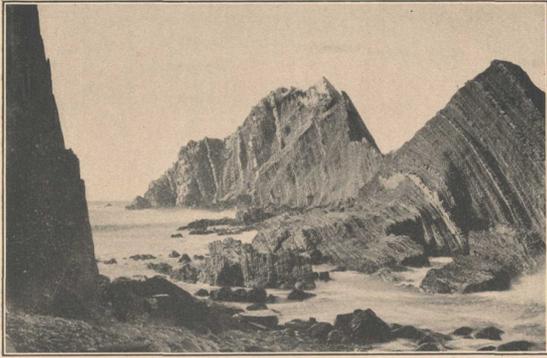


PLATE I.—STEEPLY TILTED ROCKS OF SAN PEDRO POINT, SAN MATEO QUADRANGLE.
Shales and sandstones of Martinez formation.

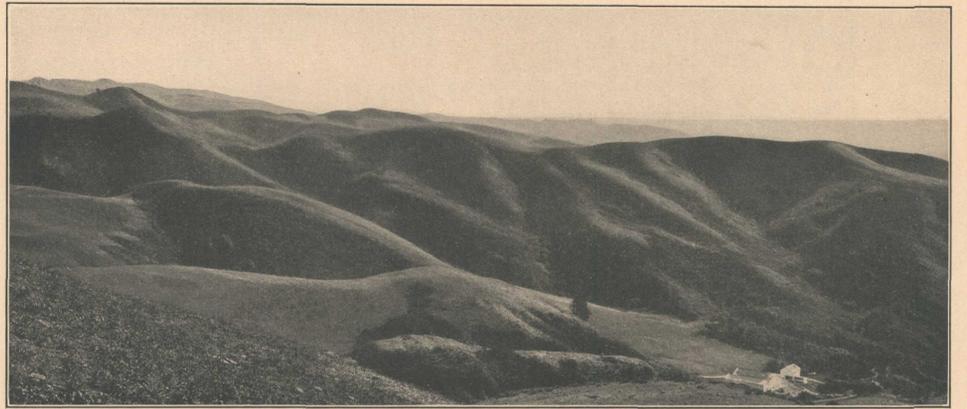


PLATE II.—WESTERN FRONT OF THE BERKELEY HILLS, VIEWED FROM THE NORTH ACROSS THE CANYON OF STRAWBERRY CREEK.
Characteristic Coast Range topography.



PLATE III.—CALERA LIMESTONE MEMBER OF CAHIL SANDSTONE, FRANCISCAN GROUP, CALERA POINT, SAN MATEO QUADRANGLE.
The limestone contains layers of dark chert.

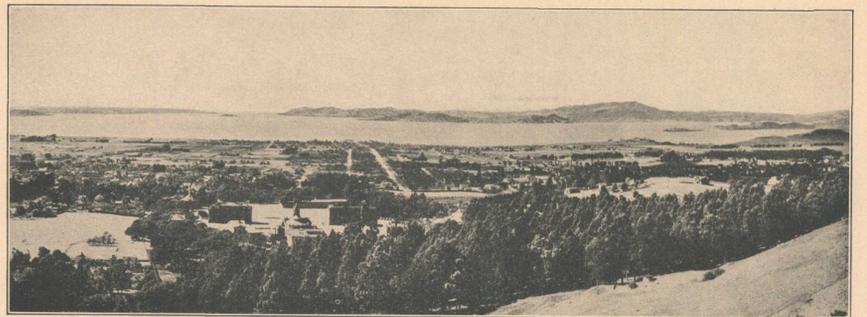


PLATE IV.—SAN FRANCISCO BAY, FROM THE BERKELEY HILLS.
Berkeley in the foreground. Mount Tamalpais at the right across the bay and the Golden Gate at the left of the center.

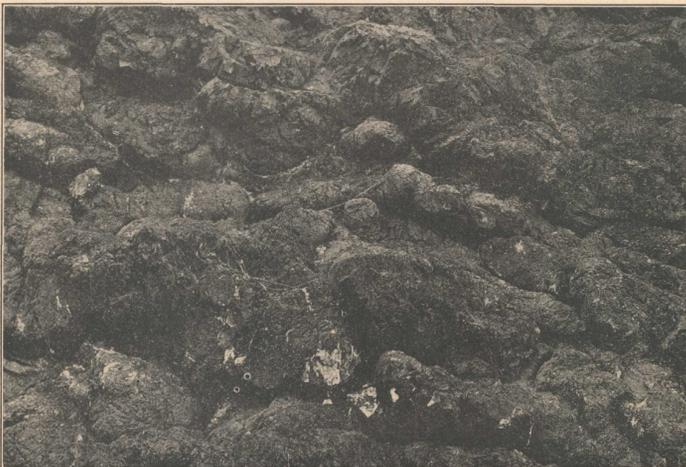


PLATE V.—ELLIPSOIDAL STRUCTURE IN INTRUSIVE BASALT, HUNTER POINT, SAN FRANCISCO.



PLATE VI.—ELLIPSOIDAL BASALT INTRUSIVE INTO THIN-BEDDED RADIOLARIAN CHERT OF FRANCISCAN GROUP, HUNTER POINT, SAN FRANCISCO.
The layers of chert are much contorted by the intrusion.

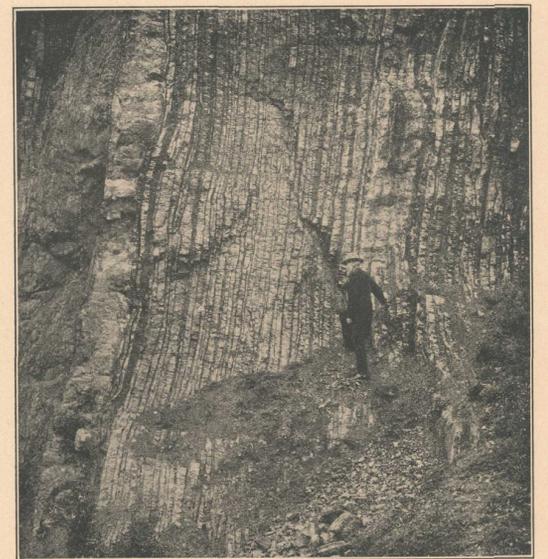


PLATE VII.—THIN-BEDDED CHERT AND SHALE OF THE CLAREMONT FORMATION, MONTEREY GROUP, CLAREMONT CANYON, BERKELEY HILLS.
The layers of shale are much thinner than the layers of chert, which are white in the picture.



PLATE VIII.—MINUTELY FOLDED THIN-BEDDED RADIOLARIAN CHERT OF FRANCISCAN GROUP EXPOSED IN QUARRY IN GOLDEN GATE PARK, SAN FRANCISCO.



PLATE IX.—SAN ANDREAS RIFT VALLEY. VIEW SOUTHEASTWARD TOWARD CRYSTAL SPRINGS LAKE, SAN MATEO QUADRANGLE.
The straight valley follows the zone of weakened rocks along the San Andreas fault. Crystal Springs Lake in the distance.

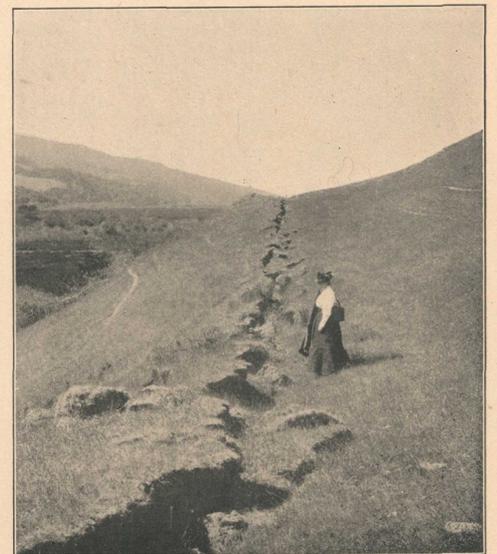


PLATE X.—TRACE OF SAN ANDREAS FAULT, MADE BY THE MOVEMENT WHICH CAUSED THE EARTHQUAKE OF 1906.
On the left is the rift valley, which extends from Bolinas Lagoon to Tomales Bay.