PHYSICAL GEOGRAPHY OF SAN DIEGO COUNTY

Physiographic Zones	Climatic Zones	Vegetation	Life Zones
I. Coastal Terraces	BSk	Coastal Scrub Gallery Forest	Upper Sonoran
II. Foothill and Valleys	Csa	Chaparral Oak-Parkland (Grass) Coastal Scrub Gallery Forest	Upper Sonoran
III. Mountain and Valleys	Csb	Yellow Pine Forest Chaparral Oak Parkland	Transition
IV. Desert	BSk BWh	Juniper-Pinyon Low Desert Scrub	Lower Sonoran

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I. Coastal terraces (300 ± 1200 feet elevation)

A. Topography: This zone is characterized by broad, flat topped marine terraces which north of the City of San Diego rise abruptly up to 300 feet in elevation within one mile of the Pacific Ocean. (Fig I, Zone A) These terraces are dissected at right angles by intermittent stream channels, which extend from the mountains westward to the ocean. The water laid, wave cut terraces, locally known as "mesas", are most extensively developed between elevations of 300 to 500 feet. There are three marine terraces north of the San Diego River: a) Poway terrace, 900 - 1,200 feet above sea level; b) Linda Vista terrace, 300 - 500 feet; c) La Jolla terrace, 25 - 200 feet.

B. Climate: Using Miramar Naval Air Station as a representative climatological station of the coastal terraces, it can be seen that this zone lies within the Koeppen Classification of BSk - Middle Latitude Steppe Climate.

U.S. Naval Air Station, Miramar - Elevation 477 feet.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
T	53	55	54	61	61	64	68	69	68	64	60	55	61
P	2.20	1.25	1.60	.90	.41	.05	.02	.05	.09	.39	1.02	1.69	9.67

Temp. = °F

Precipitation in inches

Length of Record 1944 - 1962 inclusive

Better than 70% (8.15 inches) of the total annual precipitation (9.67) is concentrated in the winter half of the year. This semi-arid precipitation regime leaves the native vegetation wanting moisture during the summer half of the year. Because of the physiological make up of the native species, small, stiff, thick, and leathery leaves, which are designed to prevent rapid losses of water, the native species are able to exist during the dry half of the year.

C. Vegetation: (Coastal Sage Scrub)

1. Index species which grow in the drier portions of this transition zone (BSk) climatically speaking are:
   a. California Sagebrush - Artemisia Calif. - Sunflower Family
   b. White Sage - Salvia apiana - Mint Family
   c. Black Sage - Salvia mellifera - Mint Family
   d. Laurel Sumac - Rhus laurina - Sumac Family
   e. Lemonade Berry - Rhus integrifolia - Sumac Family

2. Random plant species not necessarily dominant or native, (site, soil, moisture, elevation, etc.)
   a. Wild Buckwheat - Erigonum fasciculatum - Buckwheat Family
   b. Chamise - Adenostoma fusciculatum - Rose Family
   c. Toyon - Photinia arbutifolia - Rose Family
   d. Chaparral Broom - Baccharis pilularis - Sunflower Family
   e. Scrub Oak - Quercus dumosa - Oak Family
   f. Mule Fat - Baccharis viminea - Sunflower Family
   g. Red Berry - Rhamnus crocea - Buckthorn Family
   h. Tree Tobacco - Nicotiana glauca - Nightshade Family
   i. Willow - Salix spp -
   j. Western Sycamore - Platanus racemosa -
   k. Cottonwood - Populus fremontii -
   l. Elderberry - Sambucus glauca - Honeysuckle Family
   m. Cockle Bur - Xanthiune canadeuse - Sunflower Family
   n. Dill-Sweet Anise - Anethum graveolcus - Parsley Family
   o. Common Yellow Mustard - Brassica campestris - Mustard Family
   p. Wild Radish - Raphanus sativus - Mustard Family

II. Foothills and Valleys (1200 - 2500 ± feet)

A. Topography: East of the coastal zone lie the Foothills and Valleys zone, which extends from the coastal terraces to the highland or mountain area further east, (Fig. 1, zone B). This belt averages 20 miles in width, attaining its greatest width in the northern part of the county. It is distinguished by many granitic hills and a few isolated higher peaks, which trend either parallel to the general trend of the mountain range to the east, or more often in a east-west direction. Between these hills and peaks there are numerous small and irregular stream cut valleys and basins, tending in all directions and located at various elevations of which El Cajon, Ramona (Santa Maria), Escondido Valleys are typical examples.

B. Climate: Climatological data for Ramona is used for designating the type of climate which prevails in the Foothill and Valleys Zone.

Ramona California - Elevation 1401 feet.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
T	51	52	54	57	62	68	75	74	72	64	58	54	62
P	3.29	2.01	2.82	1.64	.48	.04	.05	.13	.07	.56	1.25	1.60	14.0

Length of Record 1950 - 1961 inclusive

According to the Koeppen Climate Classification the Foothills and Valleys Zone lies within the Csa classification - Mediterranean Hot Summers. A typical winter precipitation regime is evident from the climatological data. Better than 70%, (11.53 inches) of the annual total occurs during this period. The summer season is in receipt of only 2.47 inches, placing it well within what is referred to as a pronounced dry season. The Broadleaf Evergreen Scrub Forest, (Chaparral) is not a common type. Seldom are trees broadleaf evergreen and at the same time adapted to regions with long, hot periods of summer drought. In the Chaparral, protective devices against rapid transpiration permit the trees to retain their foliage, and consequently their evergreen characteristics, during the period of drought. In most instances woody parts are more prominent than foliage. Park landscape indicates slightly more moist conditions, or in some cases better soil conditions.

C. Vegetation: (Chaparral, Oak and Parkland)

Most of the species represent subhumid land types and possess various xerophytic structures, such as small or reduced leaves, thickened epidermis, hard and very dense wood, vertically placed leaves, small flowers and seeds adapted to xerophytic conditions.

[redacted] Near Mt. Woodson

1. Index Species: (Chaparral) (Dry slopes and ridges)

a.	Ceanothus	- spp. macrocarpus, spinosus?
b.	Manzanita	- Arctostaphylos spp.
c.	Mountain Mahogany	- Cercocarpus betuloidea
d.	Sugar Bush	- Rhus ovata
e.	Chamise	- Adenosloma fasciculatum
f.	Toyon	- Rhotinia arbutifolia
g.	Holly Leaf Cherry	- Prunus ilicifolia
h.	Scrub Oak	- Quercus dumosa, orter spp.
i.	Yerba Santa	- Eriodictyou crassifolium

2. Index Species: (Oak, Parkland, Grass)

Existence of gentler slopes, better soils or level land appears to favor the live oak and grass over chaparral.

a. Live Oak - Quercus spp.
b. Perennial grasses

III. Mountain and Valleys (2500 - ± 4000 feet elevation [redacted]

A. Topography: The Mountains and Highland Basins or Valleys belong to what is known as the Peninsular Range. These mountains trend in a northwest - southeast direction or nearly parallel to the Pacific Coast and to the Gulf of California farther south. This zone rises rapidly from the eastern edge of the foothill zone particularly in the northern half of the county, (Fig. 1, zone C). Elevations in this zone decrease from north to south, with elevations of 6000 feet or more being common for most of the principle peaks of which Palomar, (6,138 feet); Hot springs mountain, (6,533); Volcan Mountain, (5,750 feet); Cuyamaca Mountain, (6,515 feet); and Laguna Mountain, (5,906 feet); are most important. Besides these peaks there

are several basins and stream valleys which are enclosed by mountain walls on one or more sides. They vary in size, form, elevation, and position, yet they show a tendency to flank the most elevated highlands, and to align into a northwest - southwest series. Warners, Dodge, Santa Ysabel are typical examples.

B. Climate: Julian-Wynola will be used as a representative climatological station for the Mountain and Valleys Zone.

Julian-Wynola, California - Elevation 3650

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
T	44	45	46	50	54	61	69	68	65	57	50	46	55
P	5.62	3.53	4.63	2.53	1.24	.12	.54	.59	.76	.80	1.97	2.65	24.95

Length of Record 1950 - 1961 inclusive

The above climatological data places this portion of the Mountain and Valleys Zone in a Mediterranean Cool Summers Climate (Csb). This zone experiences the same winter precipitation regime as previously mentioned in the last zone. However, larger amounts are recorded during this winter period than in the Foothill and Valley Zone. The larger amounts of precipitation coupled with lower winter and summer temperatures, due basically to decreased evaporation and increased elevation, permits the growth of a coniferous forest type of vegetation. Because of reasons mentioned below this zone is not completely covered with coniferous trees.

C. Vegetation: (Yellow Pine Forest, Chaparral, Oak Parkland - Grass)

Yellow Pine Forest occupies the higher mountains of this zone. North facing slopes, in favorable locations, permits this type of forest to grow to lower elevations. In drier locations (example, south facing slopes) forest frequently gives way to chaparral.

[redacted] Kentwood In The Pines

1. Index Species: (Yellow Pine Forest)

a. Western Yellow Pine	Pinus ponderosa
b. Jeffery Pine	Pinus ponderosa variety jeffrayi
c. Incense Cedar	Libocedrus decurrens
d. Deciduous Black Oak	Quercus kelloggii
e. Coulter Pine (Big Cone)	P. Coulteri
f. Big Cone Spruce	P. Macrocarpa

2. Index Species: (Chaparral, Oak-Parkland)

Lower, more open parts of forest. In some places forest being replaced by chaparral where logging has occurred or because edaphic, site, etc. reasons.

a. Ceanothus spp. (prostrate)	
b. Manzanita spp.	
c. Live Oak	Quercus spp.
d. Coffee Berry	Rhamnus calif.
e. Ribbon Wood	Adenostoma sparsifolium
f. Chamise	Adenostoma fasciculatum
g. Cottonwood	Populus fremontii
h. Willow	Salix spp.

IV. Desert (± 2500 - ± 1500 feet elevation)

A. Topography: A few miles to the east of the summits of the Peninsula Range, the mountain belt breaks off suddenly with an abrupt scarp of 1500 to 2000 feet to the western edge of the Salton Sink plain, (Fig. 1, Zone D). This desert plain is characterized by its gentle slope toward the Salton Sea, and by mountain spurs and structural valleys and canyons such as Oriflamme Mountain, Vallecito Mountains, Santa Rosa Mountains, Banner Canyon and San Felipe Valley, which extend onto the plain from the mountain zone.

B. Climate:

Because of the lack of climatological stations in the immediate area covered on this trip, Borrego Springs will be used as a representative station for the Desert Zone.

Borrego Springs, California - Elevation

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
T	62	57	61	69	74	82	88	87	82	72	61	54	70
P	.71	.28	.32	.13	.02	.01	.13	.24	.06	.26	.24	.43	2.83

Length of Record 1948 - 1961 Inclusive

The climatological data for Borrego Springs places the Desert Zone in a BWh climatic realm. (Low Latitude Dry Climate or Low Latitude Desert)

From the data it can be seen that to the east of the Peninsula Range aridity becomes the key word in expressing the climate. The Desert Zone is an excellent example of a region where evaporation is much in excess of precipitation. Even though Borrego Springs is at a lower elevation than the region visited on this trip it is safe to say that the area visited is well within the limits which separate the BW from the BS climate.

To place this zone in a BS climate, with its winter concentration of precipitation, the annual precipitation would have to be more than 8.40 inches.

Because of the aridity, the vegetation occuring in this zone can be described as sparse. Widely spaced bushes, or in places, fleshy water storing plants such as cacti. Most common is the perennial xerophytic shrub. At higher elevations, forests. (Pinyon - Juniper)

The perennial shrubs grow far apart, with much bare soil showing between. This wide spacing is a response to low rainfall. Growth is very slow. Some species of plants are equipped with special forms of roots, stems, leaves to withstand drought. Some are deciduous, others evergreen in character.

Another class of desert plants, depend entirely upon the erratic rainfall, germinating with a rain, ripening seeds when moisture is gone, and dying. These annuals are not xerophytic. Adaption to this environment is accomplished by very rapid development and short duration of life.

C. Vegetation: (Juniper - Pinyon, Low Desert Scrub)

Because of the low humidity, low rainfall, drying winds, and excessive annual and diurnal temperatures the vegetation exhibits a marked development of structures to inhibit transpiration, or devices for the conservation of water. This is accomplished by the following means: a) Plants with condensed bodies (Agave), b) Plants with reduced leaf surface, c) Plants with fleshy leaves, d) Plants with resinous, woolly, or scurfy covering the whole body.

1. Index Species (Juniper - Pinyon)

   a. Juniper spp.
   b. Parry Pinyon - Pinies cembroides variety parryana
   c. Honey Mesquite - Prosopis juliafloia

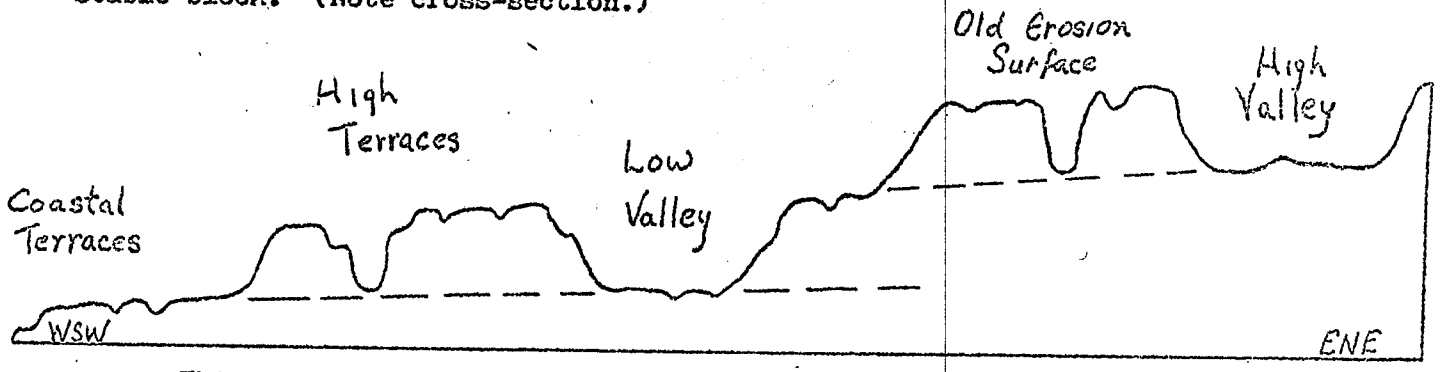
2. Low Desert Scrub

   a. Catclaw - Acacia greggii
   b. Ocotello - Fouquieria splendeus
   c. Creosote Bush - Larrea divaricata
   d. Smoke tree - Dalea spinosa
   e. Cactus - opuntea spp.
   f. Sheep Fat - Atriplex confertifolia
   g. Common Sagebrush - Artemisia tridentata
   h. Agave - Agave spp.
   i. Yucca - Yucca mohavensis

Physiography of San Diego County

The Elevated Erosional Surfaces

The ancient erosion surfaces now standing at elevations up to 6,000 feet, are those portions of The Peninsular Ranges that form the relatively stable terrain of southwestern San Diego County. (See figure I). This surface is bounded on the northeast by the Elsinore fault system and on the west by the unstable continental borderland. Within this region there are no known active faults, nor hot springs activity nor any Cenozoic faults or folds of very large displacement. Apparently there has been very little igneous activity or post-batholithic deformation of this stable block. (Note cross-section.)



This stable block, which occupies approximately the southwestern 3/5th of San Diego County can be divided into three subregions: The Coastal Plains, The High Terraces, and The Old Erosion Surface.

1. The Coastal Plain consists of a series of terraces between sea level and about 550 feet, extending 15 miles inland at the Mexican border and narrowing to about a mile at San Onofre, just south of the Orange County line.

   The San Diego County coastline has two promontories, a broad northern one (Mt. Soledad) and narrow southern one, (Pt. Loma). The "mesas" of San Diego (see Block Diagram) are terraces cut by wave action and covered with a thin veneer of rather coarse marine deposits. The San Diego Mesa surface appears to be an almost featureless plain broken intermittently by deep stream cut gorges. (Actually these are many gentle undulations on the surface of this mesa, such as long, low ridges which may have been beach ridges, or due to differences in weathering and erosion in different parts of the mesa.) Prairie mounds are also found on the Linda Vista Mesa. These are small hillocks 3 feet or more high and having a basal diameter of 10 - 20 feet. These mounds may represent the locations of sand accumulations around, as well as the irregular removal of sand between bushes or other clumps of vegetation.

2. The High Terraces are located immediately east of the coastal plain. The terraces are composed of Cenozoic strata which rises several hundred feet above the elevations of the coastal plain. Although highly dissected in many places, high terrace surfaces can be seen up to elevations of about 1100 feet. (Examples occur at: around 800 feet immediately northeast of San Diego State; between 700 - 800 feet above the western edge of El Cajon Valley and notching adjacent Cowles Peak, (S Mountain). A small terrace remnant can be seen at about 1050 feet above Slaughterhouse Canyon on the road between Lakeside and Ramona.

3. The Old Erosion Surface is cut in the crystalline rocks located to the east of the High Terraces and stand well above modern stream valleys and canyon gorges. It rises, from an elevation of above 1400 feet in the west, at about 100 feet per mile, eastward to an elevation of 6,000 feet near Laguna. Prior to the lowering of this surface it was one of a moderately rolling terrain which by differential erosion has left behind many small peaks and considerable monad rocks, (El Cajon Mt., Viejas and Cuyamaca Peaks) above the general elevation.

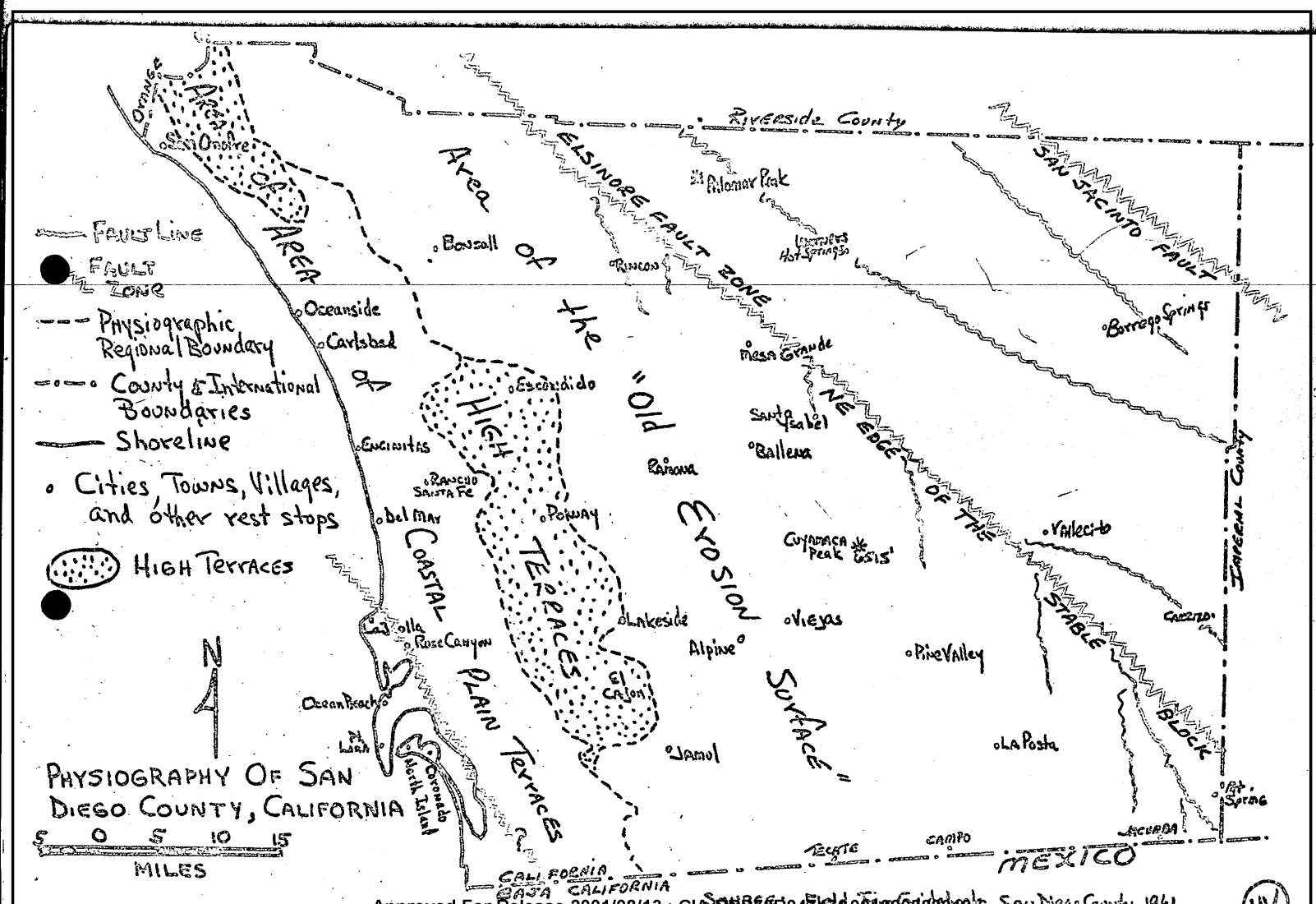
Low and High Valleys have been cut down into this old surface.

a. Low Valleys and gorges with floors between 350 and 600 feet developed on the old surface of the stable block and concurrently out onto the coastal terraces. Examples are Dehesa, El Cajon, San Diego River, Poway, San Pasqual, and San Marcos Valleys. The Otay, Sweetwater, San Diego, Penasquitos, San Dieguito, San Luis Rey, and Santa Margarita Rivers each penetrate deeply into the old erosion surface prior to eroding into the coastal plain.

b. High Valleys such as Jamul at 1,000 feet; Fairview, 1100 - 1300 feet; Galloway, 1250 feet; Barona, 1300 - 1350 feet; San Vincente, 1350 feet; and Ramona, 1400 - 1500 feet, begin to appear immediately east of and just above the High Terraces. Most of these valleys are local erosional base levels, although some, (i.e., Galloway Valley, a remnant of the old San Diego River Valley) have been pirated by headward erosion from the lower elevation drainage system. The elevation of these older cycle valleys increases eastward in proportion to their distance inland: Potrero, 2300; Viejas, 2400; Santa Ysabel, 3000 feet; Descanso, 3300 feet; and Pine Valley, 3500 feet.

In some areas this old surface portion of the stable block is only represented by peaks and ridges above the high valleys, but in other portions, (i.e., the Davis Plateau) it extends for miles in every direction.

The Elsinore fault zone marks the northeast edge of the stable block. Conjugate faults related to the Elsinore zone extend into the otherwise stable block (several of these are suggested on Fig. 1). The Palomar Mts., Volcan Mt., the Laguna Mts., and various other units are fault blocks.



Source: Field Trip Guidebook, San Diego County, 1961
57th Ann'l Mtg., Cordilleran Section, GSA, SDSC.

HV

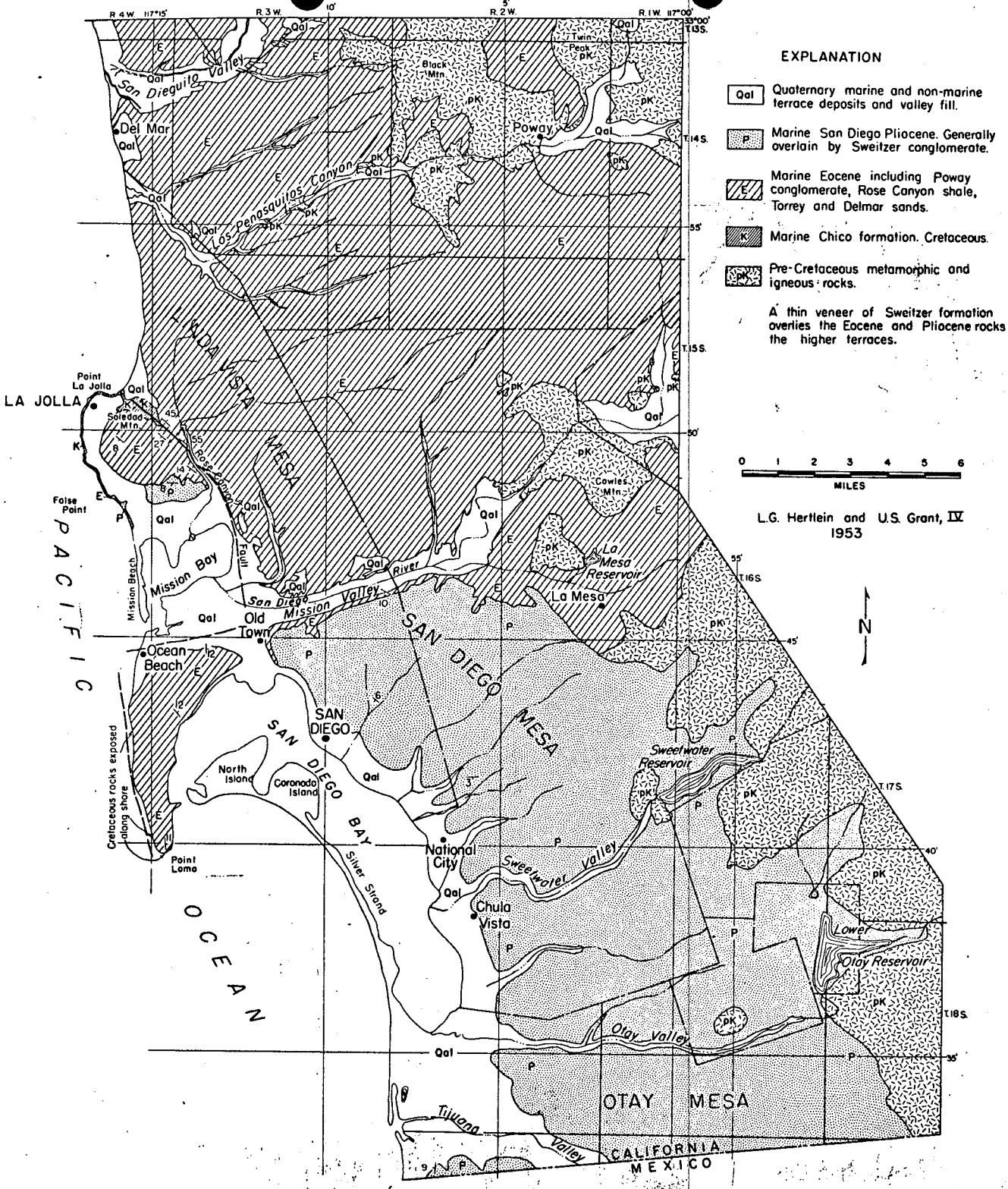


FIGURE 1. Geologic map of a part of the Oceanside—San Diego coastal area, southern California.

Gabb, *Pitar uvasanus* *tehachapi* Anderson & *ondii* Gabb, *Pseudoliva* M. A. Hanna. This as- to that of the upper the north. Some ver- n the Poway conglom- e.

. Oligocene sediments ; indeed, no sediments Eocene and Pliocene. 523) have recorded the are interlayered with rona Islands group, tional boundary. These ddle Miocene age. The ed to the San Onofre this chapter).

ntified by Dall in 1874 Canyon, Balboa Park, Diego formation, which hiefly of yellowish and nounts of conglomerate. gular discordance upon Poway conglomerate or at Pacific Beach, where Pleistocene sand, and is in the San Diego Mesa. outh slope of Soledad

ical i rtebrate fossil r early upper Pliocene hold, *Dendraster ashleyi* *Merriamaster pacificus* rtlein, *Ostrea vespertina* *Lyropecten) cerrosensis* *Pecten (Swiftopecten)* Dall, *Pecten (Plagi-* *la* Stearns, and *Opalia* f the same species occur l at Cedros Island and ests water warmer than ion, and probably more dros Island, Baja Cali-

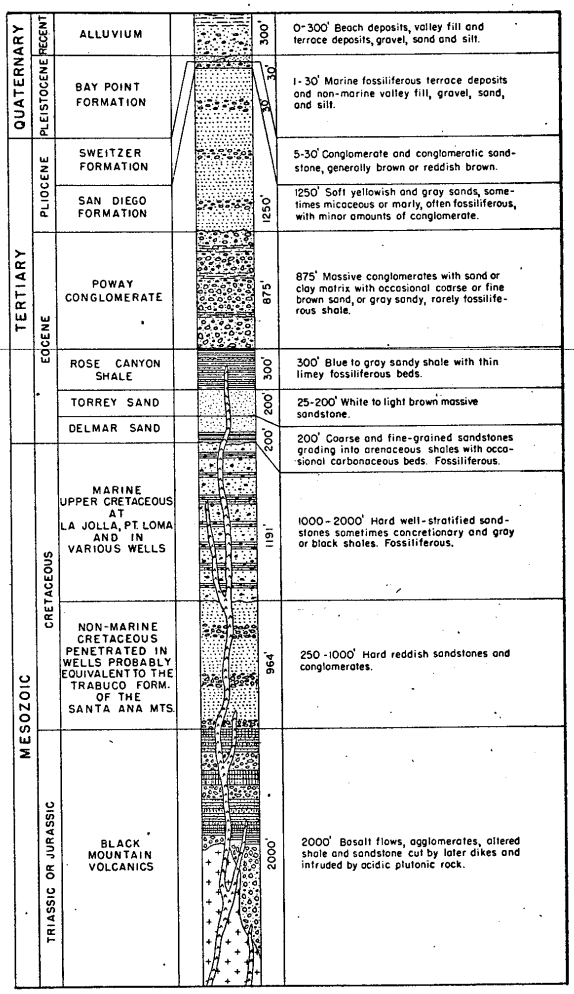


FIGURE 5. Columnar section of the rocks in southwestern San Diego County, as developed mainly from surface outcrops. Only the uppermost part of the Cretaceous section is exposed; the remainder has been encountered in various wells.

On the Sixth Avenue grade near Mercy Hospital, on the side of Mission Valley, the Pliocene beds lie upon the Eocen Canyon shale (fig. 2). Casts of *Trophosycon* have been found Pliocene beds at this place. Here the beds dip south about 1 dip, however, varies greatly from place to place, and only a distance to the south the dip decreases and the beds are horizontal.

The Pliocene rocks are mostly light brown, buff, or bluish fine-grained sandstone, but local lenses of pebbles are pres conglomerate that is more than 100 feet thick is exposed Tijuana. This and some other conglomerates apparently we posited by rivers that drained the high mountainous areas east. Marly beds occur here and there on top of San Diego chiefly near its eastern limits. Some cross-bedding, several le conglomerate, and the absence of shale all suggest shallow deposition, possibly from low tide to a depth of 50 fathom mineral grains are much fresher and less weathered than th the Eocene rocks, possibly indicating a less warm and less climate.

Thin beds of bentonite occur on the sides of the mesa in Ota Las Chollas Valleys, and in a shaft sunk near the Natural H Museum in Balboa Park, San Diego. These represent the on dence of volcanic activity in this area during the Pliocene- but volcanic rocks of probable Pliocene age are widely distr in areas only a few miles south of the Mexican boundary.

Samples of sediments dredged from the sea floor off San are lithologically similar to the San Diego formation and overlying Sweitzer beds. These have been described by Emery, (1952, p. 525). Possibly a Pliocene wedge of shallow-water sedi extends for some distance west of the present shoreline.

Sweitzer Formation. The San Diego formation is unconfor overlain by a stratum of reddish-brown conglomerate and sandstone about 20 feet in maximum thickness. This is kno the Sweitzer formation. It can be seen capping most of the south of Mission Valley, and a similar formation on the mesa of Mission Valley may be a correlative. At places it continue blanket over the edges of the Otay terrace (mesa top) to lowe races. No fossils have been found in these beds, which may late Pliocene or early Pleistocene age. The general mineral c is similar to that of the San Diego formation, and indicates th rate of erosion in the source area was rapid in comparison to th of weathering of the mineral particles.

Pleistocene Deposits. Marine fossiliferous Pleistocene de occur as terrace material at many localities along the coast, an

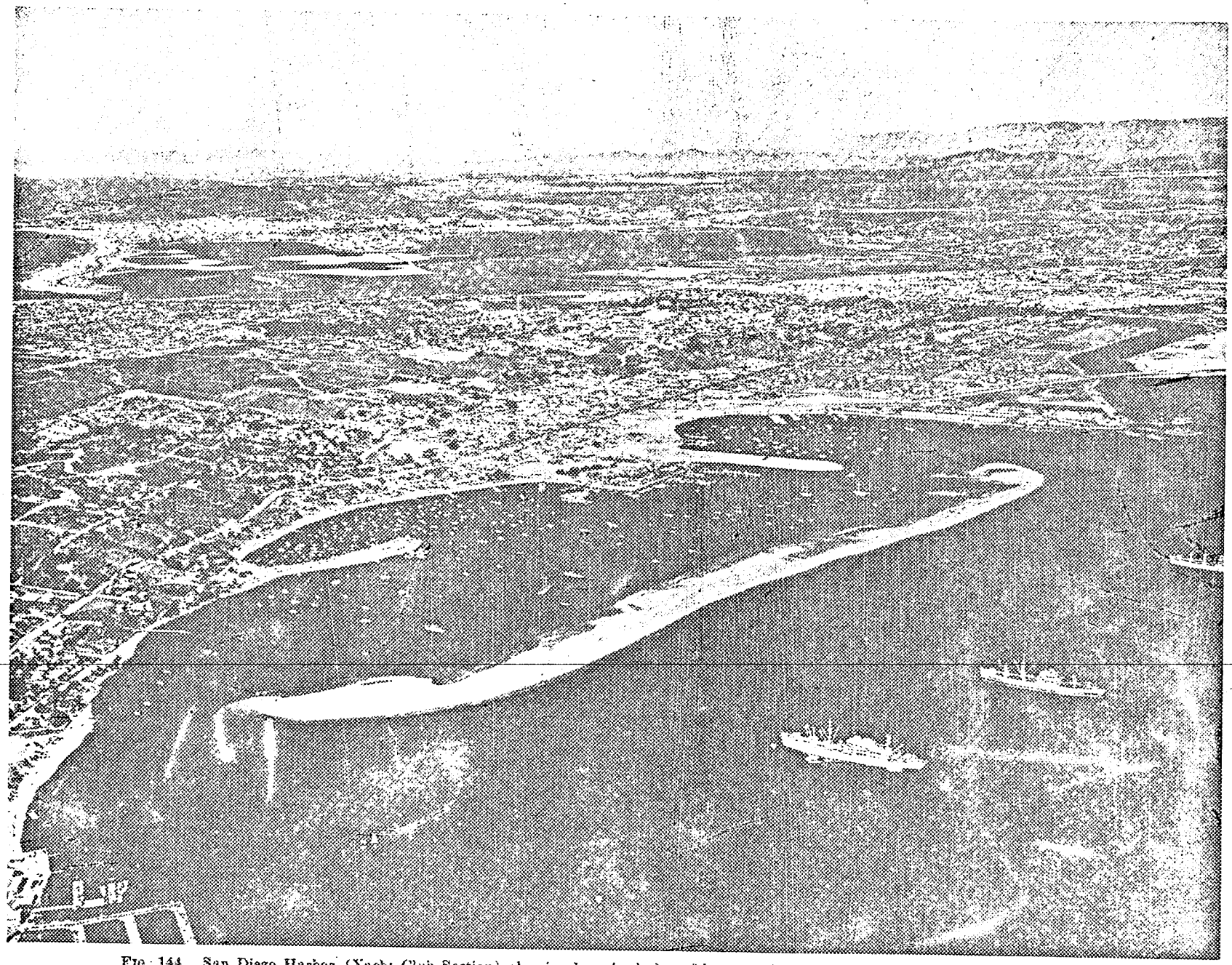


FIG. 144. San Diego Harbor (Yacht Club Section) showing long hooked sand bar standing some distance off shore. Peninsular Ranges in background. *Photo by Spence Air Photos.*

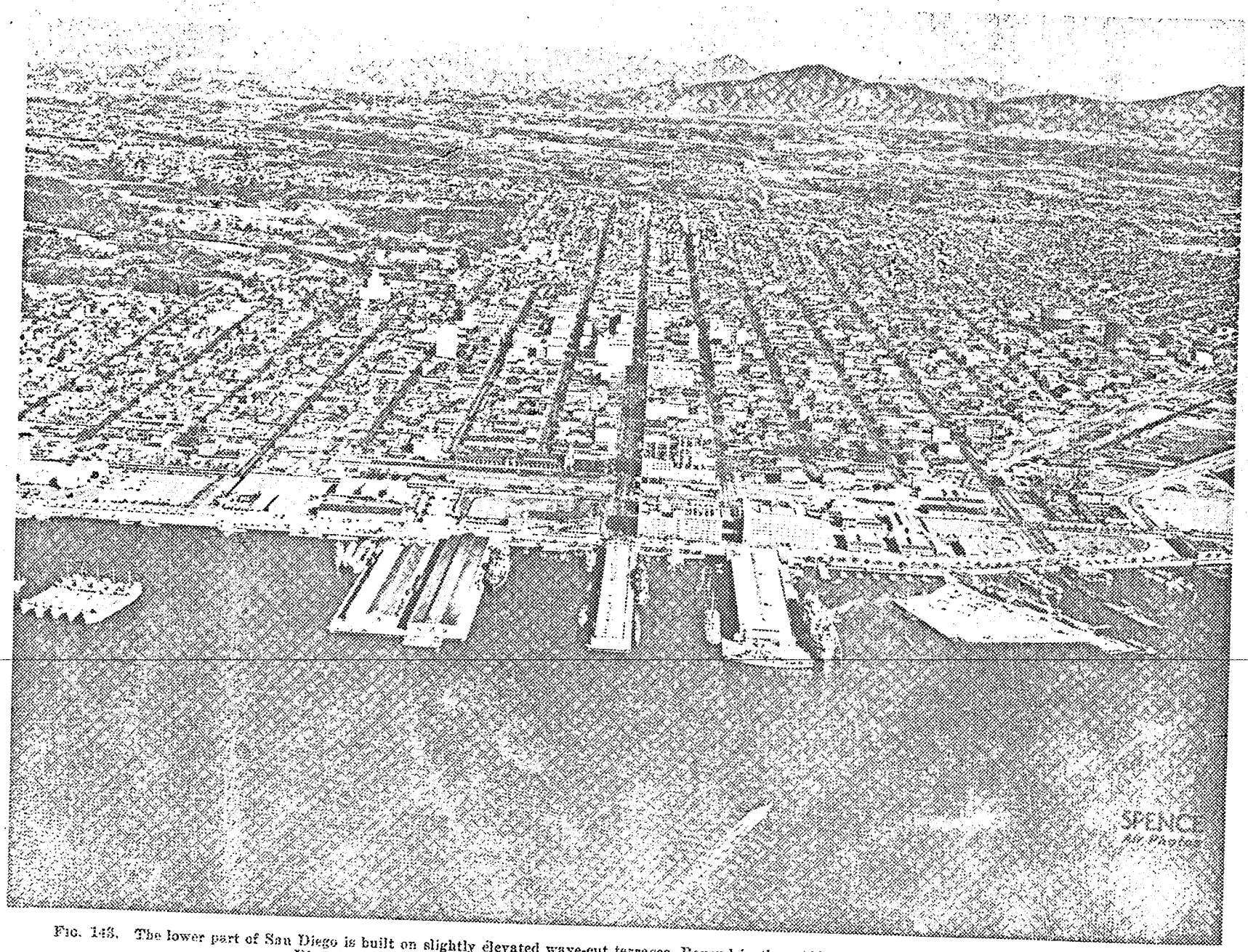


FIG. 143. The lower part of San Diego is built on slightly elevated wave-cut terraces. Beyond in the middle ground are the much broader and higher San Diego terraces. In the background are the Peninsular Ranges. *Photo by Spence Air Photos.*

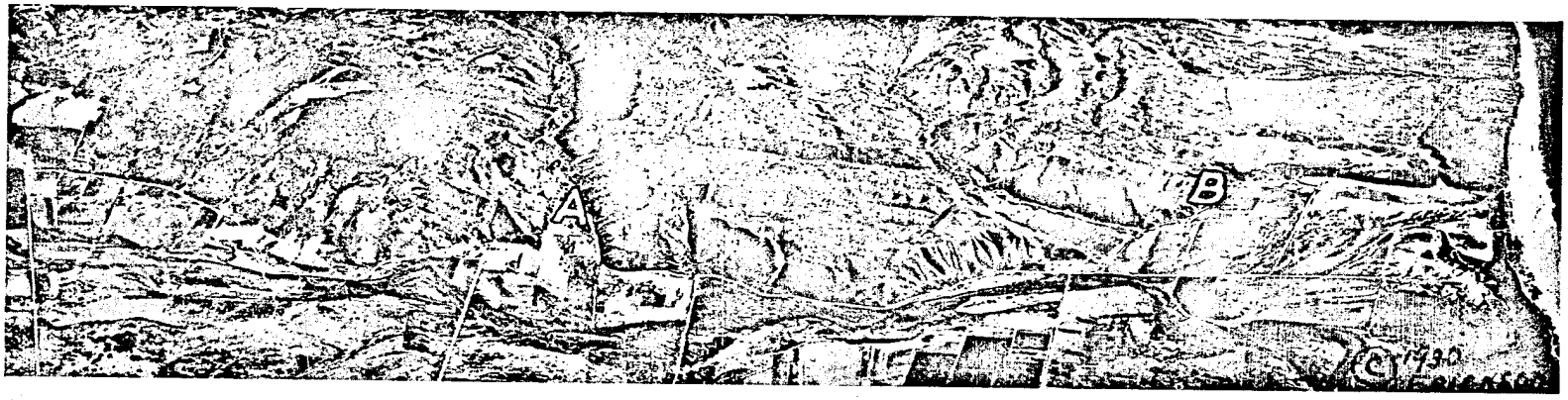


FIG. 1. Aerial view southward of mesa lands along the United States-Mexico International Boundary from the Pacific Ocean easterly about 3½ miles. Part of flood plain of Tia Juana River shown in foreground; partly dissected mesa of Pliocene rocks in middle and background. Matadero Canyon shown in center. *Pecten healeyi* was obtained from a well located in this canyon, indicated by the letter A. A second Pliocene fossil locality farther west is indicated by the letter B. Note the apparent alignment of a small eastern tributary of Matadero Canyon with a larger tributary of the next canyon to the west. This is suggestive of a fault which, if present, would pass just north of International Boundary Monument No. 257.

(Composite of oblique airphotographs by Erickson, 1930. The International Boundary is located south of the fossil localities designated by A and B).

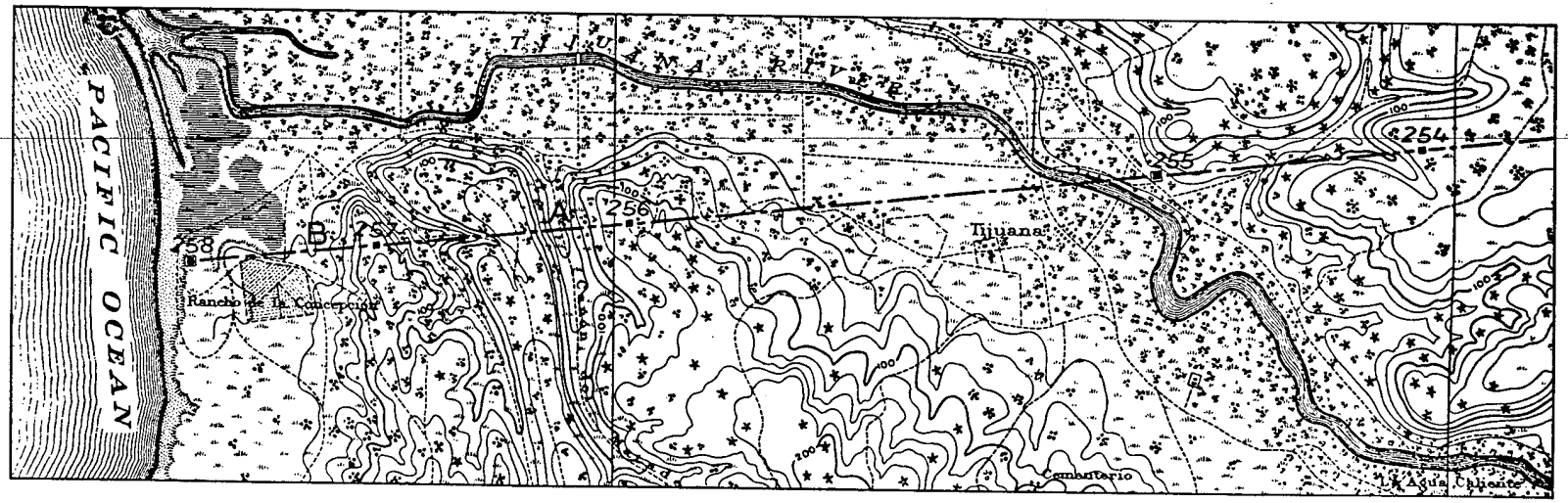


FIG. 2. Contour map of a portion of the area along the United States-Mexico International Boundary showing the location of the two fossil localities indicated by the letters A and B in the accompanying air view. Map reproduced from: "Boundary between the United States and Mexico, as surveyed and marked by the International Boundary Commission, under the convention of July 29, 1882, revised February 18th, 1889." Folio Atlas of maps and profiles, 21½ by 28¾ inches. (Fifty-fifth Congress, 2nd Session. Senate Doc. No. 247. Atlas). Published 1898. The map reproduced is the western portion of Map No. 1. Contour interval 20 metres; datum is mean sea level.

(Pacific Ocean shown at left. The aerial view above is in reversed position because the camera was pointed southward).

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Fig. 7-6. NORTHWESTERN SAN DIEGO. This view includes Mission Beach and La Jolla (left edge), Mission Bay (foreground), and Pacific Beach. (Historical Collection, Title Insurance and Trust Company, Union Title Office, San Diego)

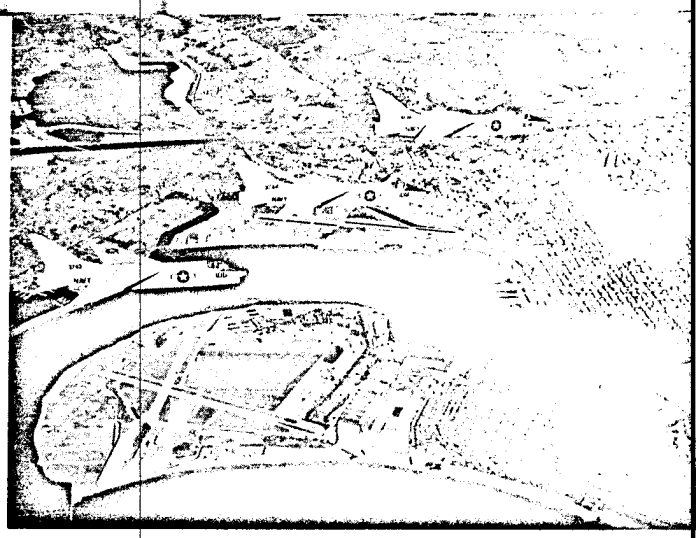


Fig. 7-7. SAN DIEGO. North Island (left) and Coronado in the foreground, then the Bay. Downtown district and Balboa Park, middle right. Lindbergh Field is in the center with Old Town to the right. View to the northeast. (Official U.S. Navy photograph)

Fig. 7-8. THE PORT OF SAN DIEGO. View toward the northwest. (The Port of San Diego)

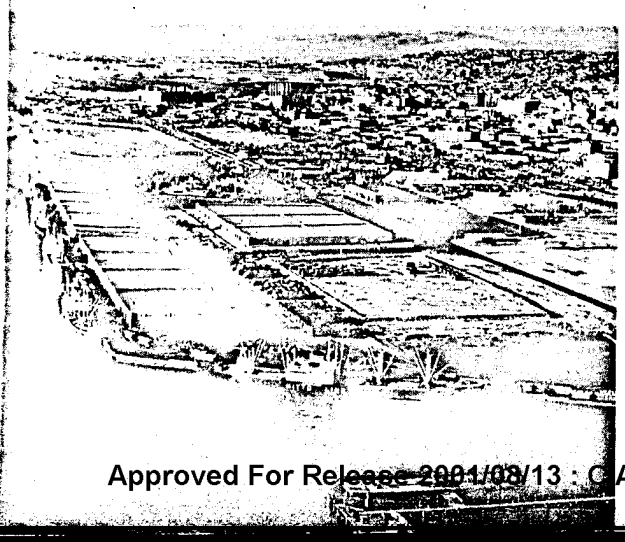
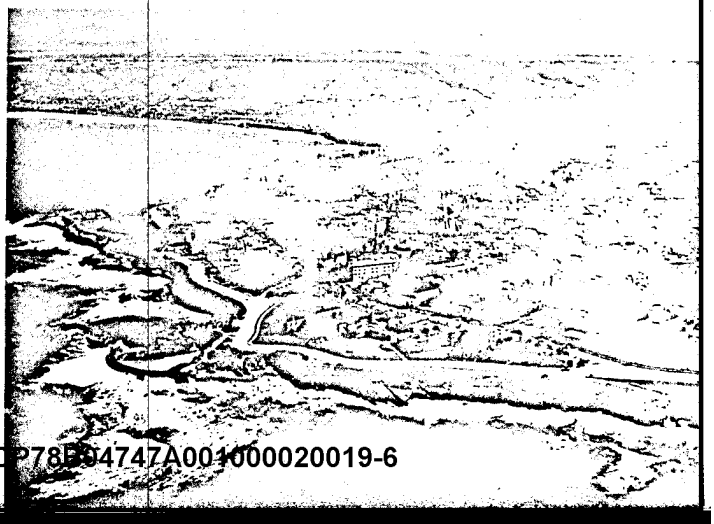


Fig. 7-9. LA JOLLA. The vertiginous coast and the wave-pounded shore have given this suburb a superlative setting. Residences rise against a slope of marine terrace known as Mt. Soledad (right). A new university campus will be developed on the terrace in middle rear. (San Diego Convention and Tourist Bureau)



an Aeronautical Co., Kearney Mesa facility (4)

A large portion of the research and development work going on in the area is carried out at the U.S. Navy Electronic Lab. Of the 1300 civilians employed, 400 have scientific and engineering degrees, of which 42 are doctorates. Programs being conducted at NEL are concerned with the development of underwater detection systems; the development of special-purpose radar, sonar and communications equipment; oceanographic studies; the evaluation of shipboard electronic equipment, and a number of other related projects.

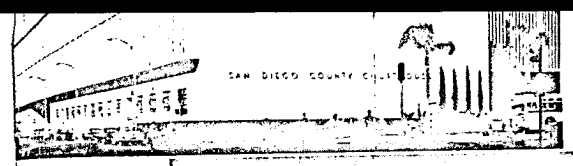
In all, the San Diego area is the home of 61 electronic firms ranging from the electronic divisions of large corporations to small engineering and development companies. Products manufactured in the area include digital voltmeters, precision measuring instruments, compact television cameras and transmitting systems, information transmitting systems, radar systems, amplifiers, oscilloscopes and a wide variety of other electronic components and equipment and systems.

SAN DIEGO AS A PLACE TO LIVE

Extending 70 miles along the Pacific coast and inland 80 miles, San Diego county has an area of 4258 square miles and a population of approximately 1,167,700. Terrain ranges from ocean beaches to The Palomar, Cuyamaca and Laguna mountains with peaks up to 6500 ft. In addition to the city of San Diego, the metropolitan area includes 12 incorporated cities, numerous towns and unincorporated residential areas. New home and apartment building has kept pace with the increasing population and a wide variety of housing is available throughout the metropolitan area. Most of the homes being constructed are ranch-style,

SMALL HOMES *(5) with three bedrooms and 1-1/2 baths are available from $13,000 up. Carports are common in this price range and are adequate because of the mild climate.*

FOUR-BEDROOM, *(6) two-bath homes are priced*



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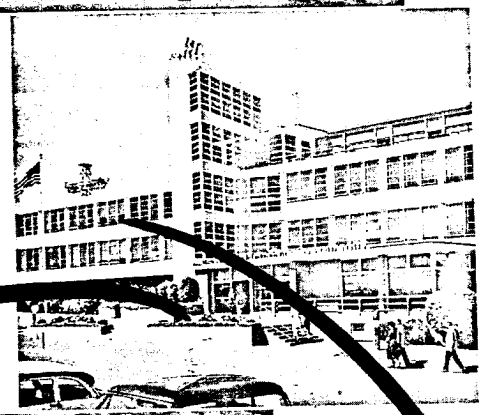
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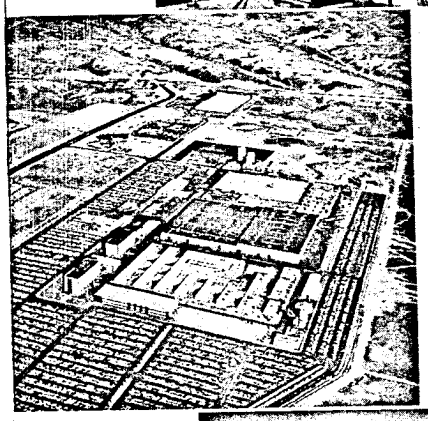
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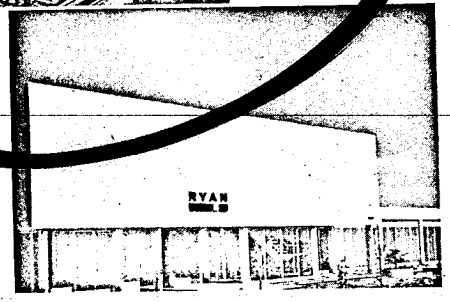

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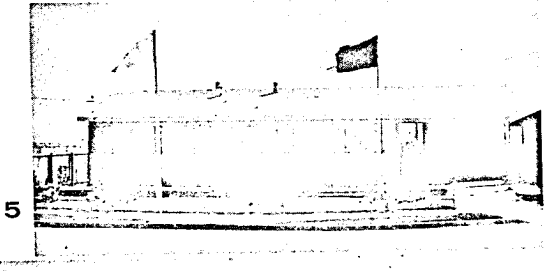
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R&D programs for space and defense.

SYLVANIA ELECTRONIC SYSTEMS IS A LONG-TIME LEADER IN THE SEARCH FOR NEW DISCOVERIES ALONG THE ELECTROMAGNETIC SPECTRUM

1963 saw Sylvania ranked 19 among 500 DOD contractors engaged in experimental, developmental, test and research work. Examples of sophisticated programs now under way range from the development and production of the electronics for the Princeton University phase of NASA's largest unmanned scientific satellite, the Orbiting Astronomical Observatory, to a study of verification methods required to prohibit the placing of mass destruction weapons in orbit on a contract from the U. S. Arms Control and Disarmament Agency.

WHAT DISTINGUISHES SES FROM OTHER ORGANIZATIONS IN THE ELECTRONICS FIELD?

Its thorough-going big-systems orientation. Inevitable when you recall that SES is a focal point for systems management of large government contracts for the entire General Telephone & Electronics complex.

The technical scope of SES programs. Among them are: Deep Space Communications • Electronic Defense Systems • Arms Control Techniques (evaluation design criteria) • Radar/Sensor Detection, Tracking & Warning Systems • Information Handling Systems (all aspects) • Guidance & Navigation Systems (missiles, aircraft, spacecraft) • Soft-Landing Techniques (other planets) • Nuclear Weapons Effects Studies • Also included: Equipment & Component Development and/or Fabrication; World-Wide Engineering Support.

The Way SES Staff Members Keep On Top of the State-Of-The-Art. Through working on small, interdisciplinary teams . . . through plentiful cross-communication within each research and engineering laboratory and between all 19 labs...through Division-wide-conferences...and also in-plant seminars and post-graduate study plans, conducted on an unusually generous scale.

"THE READINESS

CLIMAXING ALL THIS, A QUESTION REGARDING TECHNOLOGICAL OBSOLESCENCE: Should an engineer working in the SES environment worry about "technological obsolescence"? We think not. Certainly not if he takes advantage of SES self-development policies. The road here leads to continuing progress and discovery.

SYLVANIA ELECTRONIC SYSTEMS
Government Systems Management
for GENERAL TELEPHONE & ELECTRONICS

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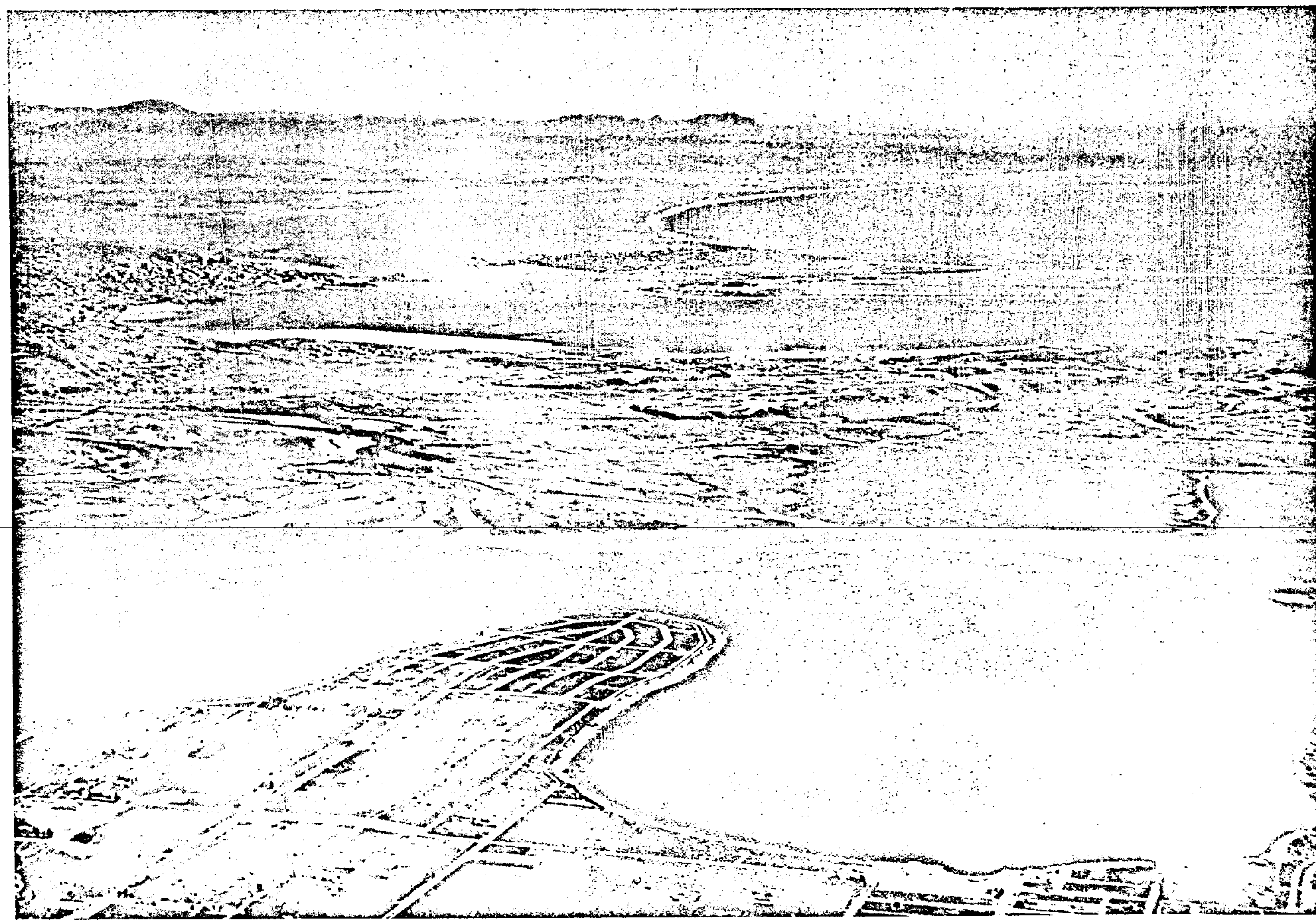

Aerial view southeastward from a position over Pacific Beach, showing the delta of the San Diego River between Mission Bay in the foreground and San Diego Bay in the background. The broad rounded promontory in the foreground is Bay Point (Crown Point). The low hilly land in the right middle ground is the northeastern part of Point Loma. A portion of the City of San Diego is shown at the left. The mountains forming the skyline are in Lower California, Mexico. (Photo 1927 by H. A. Erickson)

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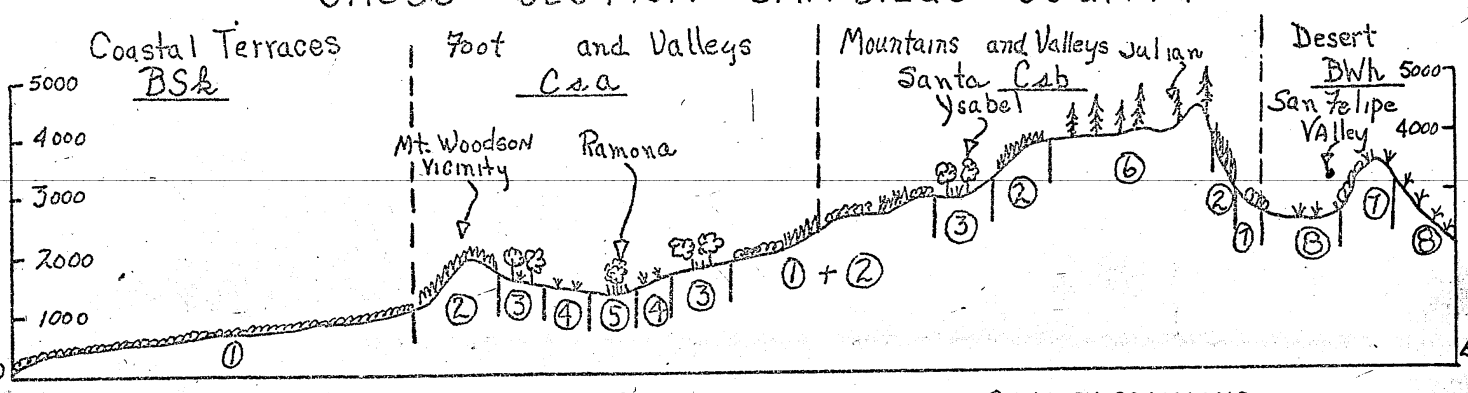
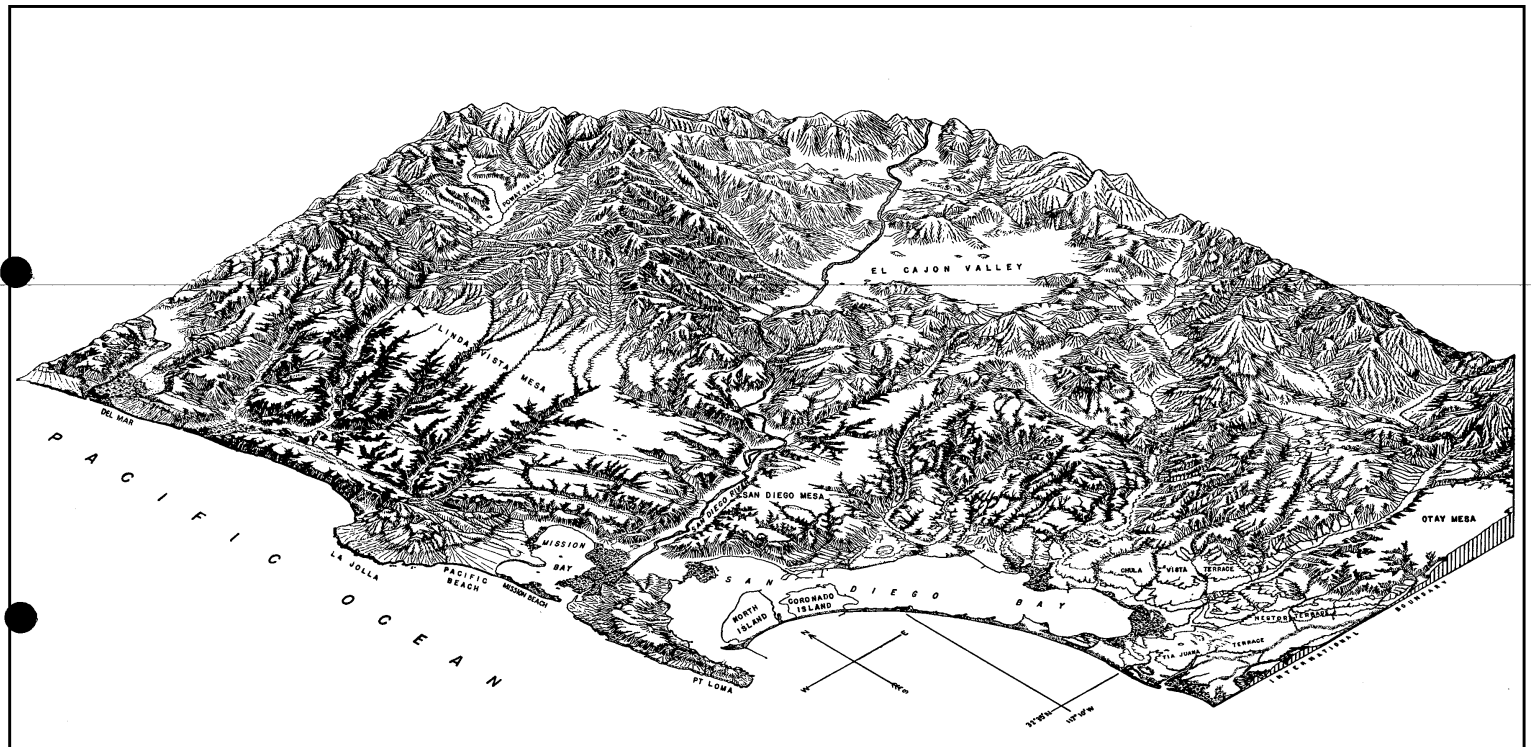
GROSS SECTION SAN DIEGO COUNTY



① COASTAL SAGE SCRUB ② CHAPARRAL ③ OAK PARKLAND SAVANNA ④ VALLEY GRASSLAND
⑤ GALLERY FOREST ⑥ YELLOW PINE FOREST ⑦ JUNIPER – PINYON ⑧ LOW DESERT SCRUB

HORIZONTAL SCALE 1:250,000 SOURCE – LOCAL AERONAUTICAL CHART
VERTICAL EXAGGERATION 10.4X BASE MAP – SAN DIEGO



PHYSIOGRAPHIC BLOCK DIAGRAM OF THE SAN DIEGO AND LA JOLLA QUADRANGLES AND SOME OF THE MOUNTAINOUS REGION TO THE EAST

(DRAWN BY E. H. QUAYLE)

25X1D