

The transverse-ridge pattern is commonly assumed to be confined to deserts and semiarid regions. The present study shows that it occurs also on coastal dunes where precipitation is very high, provided there is a long enough dry season with wind regular in occurrence and constant in direction.

TIME RANGES OF SOUTHERN CALIFORNIA TERTIARY FORMATIONS

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A regional correlation chart is presented showing time ranges of most-used formation names according to a consensus of authorities. Overlapping correlations of most formations with those above and below show them to be diagonal in time and space. Their contacts are at different time levels at different places, and thus in most instances do not coincide closely with any time divisions. Misuse of many formation names regionally through lack of proper local names is brought out.

Formations are correlated both by megafaunal and microfaunal stages as co-ordinated by a consensus of authorities. Time lengths of stages are compared. Well-defined megafaunal stages, long recognized and used, have been confused with formations, and many names are misused for formations regionally.

The time ranges of the formations are shown related to a curved line representing the generalized amount of regional sea transgression. Most major depositions of coarser clastics coincide with emergences, and major shaley deposits with submergences.

The regional curve profile, showing three gradual general transgressions with three abrupt regressions, is superimposed on a separate profile of several lesser emergences and submergences (not entirely regional) which appear related to faunal stages. Fluctuations due to local deformations were almost continuous. Most coarser formations are due to secondary or local uplifts near their basins.

PEBBLY MUDSTONES AND TILLITES

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Massive marine mudstones containing scattered pebbles crop out in California in the Knoxville formation (Jurassic) at Grindstone Creek, Glenn County; in the Chico group (Cretaceous) at Pigeon Point, San Mateo County; and in the Pico formation (Pliocene) at Santa Paula Creek, Ventura County. The unsorted and ungraded lithology, with widely dispersed pebbles, requires explanation.

The pebbly mudstones of the Knoxville crop out as lenticular beds as much as 100 feet thick that contain rare slump structures and are interbedded with graywacke, mudstone, and conglomerate, which were in part laid down by turbid flows as shown by graded bedding, flow casts, edgewise conglomerates, and current bedding. At Santa Paula Creek, where deep-water marine sediments were deposited by turbidity currents, and at Pigeon Point, successive stages in the origin of the pebbly mudstones are preserved. Beds of graded conglomerate, laid down on soft water-saturated mud, became unstable and slumped downslope, mixing the pebbles with the mud.

Pebbly mudstones originating by this process are similar to many rocks designated as tillites. In fact, times of glaciation have been introduced into geologic history, based on the interpretation of such rocks as tillites, without such independent supporting evidence as striated pavements. It is suggested that such "tillites" be restudied, for they may have originated by slumping and mixing of interbedded gravel and mud penecontemporaneously with deposition.

WHITE WOLF FAULT IN RELATION TO GEOLOGY OF THE SOUTHEASTERN MARGIN OF SAN JOAQUIN VALLEY, CALIFORNIA

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The southern Sierra Nevada and Tehachapi Mountains are made up of a pre-Cretaceous crystalline complex composed of Jurassic (?) plutonic rocks with hornblende-biotite-quartz diorite predominating, and linear inclusions of Paleozoic (?) schists, quartzite, and marble, the crystalline rocks

being overlain by a Tertiary-Quaternary marine and continental sedimentary series cropping out along the foothill areas and underlying the San Joaquin Valley where the series thickens southwesterly to an estimated total of about 28,000 feet just north of Wheeler Ridge. The Tertiary series dips under San Joaquin Valley with the crystalline-rock contact sloping southwest at an average angle of about 6°, steepening to about 20° immediately northwest of the White Wolf fault.

The White Wolf fault, nearly parallel to the Garlock fault and about 18 miles northwest of it, is a major fault traceable from Tehachapi Canyon southwest along the base of the steep northwest slope of Bear Mountain for 17 miles, and probably extends under San Joaquin Valley toward Wheeler Ridge. The southeastern block has been elevated on this fault to a maximum displacement of at least 10,000 feet as indicated by surface and subsurface data, with the maximum displacement near the mouth of Sycamore Canyon.

Surface effects along the White Wolf fault zone produced on July 21, including overthrusting in the "mole-track" scarplets formed, shortening of fences and the railroad tracks crossing the fault, and dips of the more-continuous fault-trace ruptures, strongly suggest thrusting. Seismographic evidence favors a high-angle reverse fault at depth. Ground cracks and small pressure ridges oblique to the fault trace, and small ground offsets evidence some left lateral movement.

The White Wolf fault is essentially a reverse fault, locally a thrust, elevated in the southeast block, with a small left lateral component of movement. It is more closely related to the Garlock and Pleito faults than to faults in the northern part of the area mapped.

VOLCANIC ERUPTION OF SAN BENEDICTO ISLAND, MEXICO

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On August 1, 1952, the uninhabited, deep-sea volcanic island of San Benedicto in the Revillagigedo Archipelago 300 miles off the west coast of Mexico burst into an explosive volcanic eruption for the first time in recorded history. San Benedicto is the easternmost of four islands of a linear Pacific Basin chain along which volcanism appears to have progressed from west to east. Within 2 weeks a steep-sided ash and cinder cone over 1000 feet high was built. Violent gas and smoke emanations from the half-mile-wide symmetrical crater of "Boqueron" (Big Mouth) continued until the middle of September and was witnessed by Dietz and others on two flights to the island. By September 20 a small core of lava plugged the magma conduit, and the volcano remained relatively dormant until early November when Richards observed that extrusions of blocky lava half filled the deep crater. Additional lava was extruded later in November. Commencing December 9 Richards and Lewis Walker spent 4 days at San Benedicto, arriving 2 days after blocky lava had breached the pyroclastic cone at its eastern base. This latest lava flow built 900 feet out into the sea in 24 hours. After the second day the "delta" of lava was advancing seaward at a rate of approximately 150 feet per day. The extensive collection of aerial photographs taken on previous flights to the island was supplemented by motion pictures of eruptions taken from inside the crater on December 10.

SOFAR DETECTION OF MYOJIN REEF ERUPTION OFF JAPAN

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On 17 September 1952 the MYOJIN MARU discovered a new, largely submarine, eruption 200 nautical miles south of Tokyo and adjacent to the periodically active Bayonnaise Rocks which are considered to lie along the Fuji volcanic zone. A series of great explosions accompanied the extrusion of augite-hypersthene dacite. Since 26 September, when the main series of explosions ended there has been only sporadic activity.

Because of its remoteness, only a few visual observations were made of Myojin. Additional data were obtained from a tsunami recorder on Hachijo Island, 130 kilometers north of Myojin, which detected several tsunamis initiated by the volcanic eruptions. A rather complete record of the Myojin activity was recorded by the U. S. Navy Sofar stations at Point Sur and Point Arena, California, about 8600 kilometers from the scene of the activity. Over 100 explosions were detected, one of which