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New Global Tectonics Related to West Coast Structure

by
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ABSTRACT

A current review of evidence, patterns and history of sea-floor spreading in the NE Pacific; a summary of the character and history of the San Andreas System of deformation; and some geologic implications of their relationships to a worldwide tectonic scheme.

The NE trending E Pacific Rise enters the Gulf of California from the Pacific Ocean. The essentially contemporaneous and parallel Gordo and Juan de Fuca ridges lie off the coasts of Northern California and Oregon. According to the New Global Tectonics, the SE trending San Andreas zone is a transform fault which connects these two segments of the World Rift System. Furthermore, according to the rigid-plate concept, the adjoining oceanic and continental blocks are moving away from these oceanic ridges, and post each other along the San Andreas, in NW and SE directions. On the other hand, according to the new concepts, a portion of the sea-floor magnetic pattern and the NE Pacific fracture zones (transform faults) indicate an earlier (10-30 million years ago) N-S oceanic ridge trend accompanied by E-W crustal extension. However, since the present crustal dynamics typified by the San Andreas System of deformation has been operative for a much longer time (at least 80 and possible for more than 135 million years), some doubt is cast on the interpretation of the San Andreas as a geologically young transform fault. These and other contrasting geophysical data and interpretations from the oceans tested against geologic data and interpretations from the continents serve to emphasize tectonic discrepancies. This approach, versus searching for data and interpretations which tend to confirm the New Global Tectonics, may best stimulate both continental-based geologists and ocean-based geophysicists to obtain critical information leading to the true world tectonics.

Biographical Sketch -- Mason L. Hill

Mason L. Hill, independent geologist since retiring in January, 1969, was born in Pomona, California, and obtained degrees in Geology from Pomona College, Claremont College and the University of Wisconsin (Ph.D., 1932). His professional career included geologic work with Shell Oil Company and Manager of Exploration for Richfield and Atlantic Richfield companies where he participated in oil discoveries in California and Alaska.

His scientific interest have included the occurrences of petroleum and the characteristics of faults, represented by publications on oil in California and Alaska and on the San Andreas and other faults in California.

He is a Fellow of the Geological Society of America (Councilor, 1956-59), Member of the American Association of Petroleum Geologists (President, 1962) and charter member of the American Institute of Professional Geologists.