carbon content is generally low, but increases toward the protore to approximately 0.273%. Although the occurrence of pyritic sulfur is low in the oxidation zone, it increases from 0.015 to 0.696% in the protore. Evidence also indicates an increase with proximity to the roll front. Uranium is most prevalent in the ore zone, with a maximum value of approximately 290 ppm for the samples studied. In the protore, it ranges from 37 to 44 ppm.

Adsorbed hydrocarbon analysis shows little evidence of petroleum migration from the downdip section of the deposits thus far analyzed.

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Correlation of Continental-Margin and Deep-Sea Sequences—Neogene Examples from Pacific

The Deep Sea Drilling Project (DSDP) has produced fundamental advances in Cenozoic planktonic biostratigraphy and our understanding of the Cenozoic paleooceanographic and paleoclimatic history of the world ocean. These new insights and data serve to increase the precision and resolution of provincial biostratigraphies and correlations commonly applied to continental-margin sequences, and thus result in more accurate reconstructions of margin histories. DSDP-IPOD Legs 18, 19, 31, 57, and 63 included drill sites close to tectonically active continental margins surrounding the North Pacific. They provide clear examples of correlation of deep-sea and epicontinental marine deposits in Mexico, California, Japan, and Korea. In particular, DSDP Site 173 off northern California has yielded an important lower Miocene through Pleistocene (N4-N22) reference section, demonstrating the usefulness of DSDP data for interpretation of margin biostratigraphic, sedimentologic, and tectonic events on a regional scale. Multiple siliceous and calcareous plankton zones within this sequence provide an average biostratigraphic resolution of 0.5 m.y. with paleo-oceanographically induced biofacies trends marking zones of special value for interbasin correlation across latitude. Many of the planktonic datums and biofacies trends clearly defined in the thin (320 m), but nearly complete, Neogene column at DSDP Site 173 can be readily recognized in the thick paleoenvironmentally diverse and structurally disordered, continental-margin deposits now exposed along the Pacific Coast of North America. These correlations provide a framework for calibrating provincial biostratigraphic units; estimating rates of sediment accumulation, subsidence, and uplift in margin sequences; and hindcasting periods of increased primary productivity, variations in the oxygen-minimum layer, and deposition of sediments favorable for hydrocarbon generation.

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United States Petroleum in World Energy Perspective

The recent exponential growth in the numerate handling of energy resource data has not been matched by increased knowledge of basic concepts and adequate gain in hard facts. Constant reiteration of those concepts and of the softness of most "facts" is necessary in order to avoid the dangers of pseudo-precision. This is true for both potential supply and potential demand. Consumption will be dictated increasingly by available supply. This is the reverse situation from that of the past 30 years. Increasing scarcity will not only enhance the importance of discovery forecasting but will emphasize the interdependence of all factors affecting the worldwide supply and demand balance. No one energy source and no one country can be considered in isolation. Petroleum and the United States are no exceptions.

Petroleum must be considered in the context both of other energy sources worldwide and in its optimum end-use future. The United States is only one unit in what may well be an energy-hungry world. Its own needs and the success of its petroleum industry, both in domestic and foreign fields are important, but their relevance, both locally and globally, depend on both discoveries and demand in many other countries.

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Lateral Diagenesis in Monterey Shale, Santa Barbara Coast, California

Lateral differences in Monterey strata along the Santa Barbara coast indicate increased diagenesis toward the west. Westward, silica alters from biogenic amorphous opal (in diatom frustules) to diagenetic opal-CT, and then to diagenetic quartz. Continuous exposure for 50 km, simple homoclinal structure, paleogeographic setting, and detailed analysis of 14 stratigraphic sections together show that sediments were laterally equivalent, as originally deposited. Distinctive stratigraphic differences in sediment composition, informally divided into five members, are also laterally age-constant.

Because silica phases differ in rocks of the same age, same depositional environment, and with identical bulk chemical composition, the differences must reflect post-depositional conditions. Overburden thicknesses and thermal changes in organic matter indicate that diagenesis increased westward owing to greater burial temperature.

Study of sample sets taken laterally shows that both silica phase changes occurred by rapid solution-precipitation accompanied by significant compaction, and by little movement of silica between beds. Distinctive field characteristics (hardness, brittleness, bulk density, and luster) changed mainly during opal-CT formation.

Although these changes affected rocks of nearly all compositions, details varied—even in carbonate-rich rocks—with the proportion of detrital material to biogenic or diagenetic silica. As this proportion increased, opal-CT formation was retarded, accompanying compaction decreased, "ordering" of opal-CT increased, and quartz formation was promoted. Nearly identical timing relation in associated calcareous, dolomitic, and carbonate-free rocks show that silica diagenesis was unaffected by carbonate except in rocks containing at least 10 times more silica than detrital material.