riculum which attracts a fair share of the more intelligent students is the general recognition that employment prerequisites in geology are no different from those in other sciences. The four-year program offers a broad education which is superior to many fields of academic work. If an individual desires to become a capable, up-to-date, biologist, chemist, physicist or employed geologist, he must spend from one to three years in graduate studies.

November 13, 1961

Leo R. Newfarmer, Shell Oil Company, Houston, Texas

"On Economic Cycles and Permanent Decline"

Abstract

It is generally accepted that some fundamental changes may be taking place in the oil business which are operating to decrease per capita demand; therefore, the current "recession" in the domestic oil business might have greater significance than an ordinary downturn in a fluctuating economic cycle. The idea that our fuel and energy products are so essential that growth will be automatic is a demonstrable fallacy, and we are quite justified in looking behind superficial factors for evidence of permanent decline in the use of our products. on the other hand, per capita consumption statistics from 1900 to 1960 indicate a steady upward trend, with 1960 an all time high of $57.54 per capita at crude prices and measuring all years with 1960 dollars. True, a slight decline would have occurred between the years 1955 and 1960, had it not been for the rapid expansion of the natural gas market; but taken as a whole, the market for our products and by-products is by long odds the best in the world, and the prospect of large new domestic reserves in the four million cubic miles yet to be adequately explored on this continent is great enough to justify confidence that the industry has a long-term future and that continuation of the profession of petroleum geology is assured.

November 20, 1961

Mike Monroney, U. S. Senator from Oklahoma

"Oil Depletion Allowance"

(Entire paper included at end of this section)

November 27, 1961

Burton J. Scull, Sun Oil Company Research Laboratory, Richardson, Texas

"A Comparison of the Plio-Miocene Sedimentation of the Gulf Coast with the Atokan Sedimentation of the Arkoma Basin"

Abstract

The Plio-Miocene sediments and the Atokan sediments represent similar stratigraphic sequences deposited in quite different tectonic settings. The Plio-Miocene units are associated with the organically placid Gulf Coast geosyncline. The indicated pattern of deposition is development of load-produced basins (depocenters) during cyclic offlap. The Atokan units are associated with the Quoachita orogan and represent shelf and through suites. Certain aspects of these stratigraphic sequences are comparable to the modern sediments of the northwestern Gulf of Mexico.

The depositional patterns of the Plio-Miocene and the Atokan sedimentary prisms reflect structural-sedimentation interrelationships. In each prism, flexure zones demark abrupt thickening of the sedimentary units. The Atoka was deposited on more competent sub-strata than was the Plio-Miocene so that

fewer major flexures developed. The depo-axis of the Atoka probably was tectonically controlled (a facies scrap) and the depo-axis of the Plio-Miocene (if properly located) was determined by sedimentary processes.

Although the structural-sedimentation histories are, geologically, the most significant, the Plio-Miocene and the Atoka have a number of other features in common. Each is very predominantly clastic, represents a new area of maximum sediment accumulation in the depositional basin, and displaced a carbonate-shale facies. Prograding deltaic facies dominate the depositional environments but cyclic deposition is a prominant aspect of the sedimentation. Both the Atoka and the Plio-Miocene thicken at comparatively rapid rates and attain greater thicknesses than the associated older and younger sediments.

Kuendig (1959) reasoned that geosynclines should be classified by structural configuration, not sedimentary content. The similarities of the Plio-Miocene and the Atoka Indicate that sedimentary patterns reflect source areas, transport and depositional processes, and topography; not the structure of the catchmeat basin.

December 4, 1961

Richard G. Bader, Asst. Director, Earth Sciences Division, Natl. Science Foundation

"The Association of Organic Materials and Minerals in the Sea"

Abstract

The building blocks for scientific endeavors such as Geology, Geochemistry and Oceanography are the observations resulting from field work. These field observations or experiences have given us the basic descriptions upon which to work. The descriptions themselves, however, are not the end product. We wish to explain how such an arrangement is possible; we strive to determine the mechanism or mechanisms which may be operative thereby giving us the product which has been described. One possible method available to us in our search for representative factual information on these mechanisms is that of laboratory experimentation.

The specific problem to be discussed concerns the inclusion of organic material into marine sediments. Both sedimentary minerals and organic material are found in the sea, the water column representing a temporary place of residence. The sediment particles pass through the water column to become a part of the marine bottom deposits. The organic material has three routes to follow; it can be incorporated into the living organisms of the sea, be decomposed into its ultimate products, or find its way into the bottom deposits. The point of interest here is the latter, and there are two basic ways for sea borne organic material to become a part of the deposits, by settling out as discrete particles or by being removed from the dissolved state in an association with organic particles. The settling of discrete particles is readily observed by fragmental inclusions in deposits. The association of dissolved organic compounds with minerals in the sea has been concluded but hardly demonstrated. Likewise, the mechanism for such an association has been inferred but remains essentially unsubstanciated.

Because of the complexity of the mineral-organic association in an aqueous system and the difficulty or impossibility of investigating such an association in the sea itself, controlled laboratory experiments represent one possible means of approach. The investigation to be discussed revolves about the ecological and geochemical significance of organic material in sedimentary deposits and is based on the use of radioactive tracer methods devised for elucidating the mechanisms of mineral-organic associations.