OCCURRENCE OF HYDROCARBONS IN RECENT SEDIMENTS

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Abstract by
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Many theories concerning the origin of petroleum have emerged simply because of the elusive nature of petroleum. Perhaps the most widely held premise embraces the deposition of organic material in a marine or brackish water environment. Recently a school of thought has developed which says that oil formation may begin soon after the deposition of organic matter in sediments. This study proved that fatty and aromatic hydrocarbons are present in Recent sediments.

Samples of Recent sediments from the Grand Isle and Pelican Island areas of Louisiana, the Gulf of Mexico off Corpus Christi and from Laguna Madre were analyzed. Hydrocarbons were present in the organic matter extracted from all of these samples. In examining cores from the Grand Isle and Pelican Island areas it was determined that the sandy part of the cores contained eight times as much hydrocarbon as did the silty clay part in contact with it. This indicates some of the original hydrocarbon content of the silty clay may have been lost to the sand layer underlying it. The organic matter in the sands was also more petroleum like than that in the clays. By carbon 14 measurement apparent ages of 11,800 to 14,600 years were obtained for hydrocarbons extracted from the Grand Isle core.

In general the amount of free hydrocarbons in the samples increased with increasing depth of burial while the amount of organic matter remained nearly constant. It is inferred from this that the organic content is being changed in the direction of petroleum with increasing depth of burial and age. Data obtained from the 106 foot Grand Isle core gives a figure of 4,500,000 barrels of oil per cubic mile of sediments.

Samples of phytoplankton and of dehydrated bluefish and oysters were also analyzed by a process similar to that used on the sediments. In each case petroleum like hydrocarbons were obtained. The phytoplankton contained more than 2000 parts per million of hydrocarbons. Using the value of 6,400 tons per square mile of ocean surface, for annual production of phytoplankton in the sea, these organisms could produce 87 barrels of hydrocarbons per square mile of ocean surface each year.

From the above examples it is evident that hydrocarbons of various types are present in small concentrations in many forms of plant and animal life. It also seems plausible that petroleum is being formed in the present era and that the crude product is nature's composite of the hydrocarbon remains of many forms of marine life.

The problem of how the small, highly dispersed droplets of hydrocarbons in the clays collect to give an oil accumulation is currently being investigated.