with the latter occurring consistently only in the lower two-thirds of the section. Although the −40 +140-mesh insolubles increase slightly toward the top, the allogenic "heavies" are more abundant in the top and bottom third than in the middle. Some microfossils such as brachiopods, gastropods, and sponge spicules have different abundances in the lower and upper part of the section. Approximately 3,500 conodonts, assigned to 27 genera, vary in concentration from less than 2 to more than 200 individuals per 100 grams, with the average about 40. However, exceptionally low concentrations are adjacent to exceptionally high. The moving averages of both concentrations and numbers of genera show a decreasing trend toward the top of the section. The different conodont elements—that is, cones, compound, and platform types—show a stratigraphic variation per sample for concentration in the rock and percentage of total fauna, suggesting that some types were carried by different animals. Stratigraphically, the distribution of certain genera seem to show a relation to the occurrence of the biosparite, the heavy minerals, and other microfossils. The trends and variations in the Colborne quarry are probably local, but the relation between petrographic and paleontologic factors suggests that environmental conditions probably controlled the conodont distribution.

ZARRELLA, W. M., AND EARLEY, J. W., Gulf Research and Development Company, Pittsburgh, Pennsylvania

SIGNIFICANCE OF HYDROCARBON DISPOSITION IN PETROLEUM EXPLORATION

Organic matter occurs ubiquitously in the geological column, but the occurrences of commercial petroleum accumulations bear a relation to types and amounts of hydrocarbons found in equivalent rock strata. The distribution of organic carbon in a sedimentary rock unit, as well as in recent sediments, varies both vertically and lateraly and appears to be dependent on parent material, lithology, environment of deposition, and post-depositional processes. Clays deposited in a near-shore marine environment exhibit a high organic carbon content. The Mowry shale of Lower Cretaceous age in Wyoming has an organic matter content which reaches a maximum in an area where sediments are thought to have been deposited in a relatively shallow marine environment. The frequency of occurrence of oil fields in the Lower Cretaceous in the general area where the content of organic matter is high, and the enhanced concentration of hydrocarbons in sand lenticles in the Gulf of Paria sediments (Kidwell and Hunt, 1958) suggest that a portion of the petroleum generated in a source rock can be and is accumulated in close proximity to the locale of petroleum generation. The chemical constitution of Cretaceous crude oils from the Clearwater group on the eastern flank of the Alberta basin and from the McMurray sands at Athabaska strongly indicates the correlation of these petroleums, suggesting an equivalent source, probably Lower Cretaceous shales. Although there is considerable evidence for lateral migration of petroleum, crude oil correlation studies suggest that vertical migration is restricted, except possibly along fractures in the rock system. This view is further supported by consideration of the variations in benzene concentration around an oil pool. There is abundant evidence for mgiration of benzene several miles laterally, but vertical migration through overlying fine-grained competent rock is negligible. It is clear from the composition, properties, and distribution of organic matter that oil pools do not occur randomly in the subsurface, but, rather, they occur in those parts of the geologic column where petroleum has been generated, where reservoir rocks are available, and where suitable trapping conditions exist.

From considerations of the disposition of organic matter in a rock system, it should be possible to determine quantitatively the amount of petroleum generated in a given rock unit and which parts of the geological section are most likely to be productive. More directly, the types and amounts of hydrocarbons and their distribution in the subsurface can be used to evaluate the existence of an undiscovered oil pool.

MEMBERSHIP APPLICATIONS APPROVED FOR PUBLICATION

The executive committee has approved for publication the names of the following candidates for membership in the Association. This does not constitute an election but places the names before the membership at large. If any member has information bearing on the qualifications of these nominees, he should send it promptly to the Executive Committee, Box 979, Tulsa, Oklahoma 74101. (Names of sponsors are placed beneath the name of each nominee.)

FOR ACTIVE MEMBERSHIP

Aharoni, Efraim, Tel Aviv, Israel
(Joseph Coates, Walter Randall, Moshe Goldberg)
Atamanchuk, Wilfred Ernest, The Hague, Netherlands
(John P. Walsh, James Crawford Parry, Gerald W. Fuller)
Conway, Horatio Joseph, Tyler, Tex.
(Robert W. Eaton, Wynne M. Adams, John G. Voight)
Cullins, Henry Long, Denver, Colo.
(N. Wood Bass, Keith A. Yenne, George H. Horn)
Gnagy, Laurence Earl, Midland, Tex.
(Joseph C. Carl, William B. Newberry, H. David Pennel)
Harvill, Robert Sebran, Jr., Corpus Christi, Tex.
(Walton S. Launey, Charles W. Holcomb, Harold W. Owens)
Hentz, Max Ferdinand, Tripoli, Libya
(John P. Walsh, James Crawford Parry, Jack Wild)
Kellogg, Harold Eugene, Tripoli, Libya
(Hugh D. Klemme, Allan S. Westerholm, Marshall Kay)
Kent, Bion Huntley, Lakewood, Colo.
(Thomas A. Hendricks, G. P. Salas, Ralph L. Miller)
Lyons, Percy Marvin, Lafayette, La.
(James H. Morris, Adam M. Sturlese, Jay B. Wharton, Jr.)
McCaffrey, Richard Joseph, Denver, Colo.
(John O. O'Brien, H. Bruce Tiffin, Robert E. Folinsbee)
Nelson, Rex Woodrow, Jr., Houma, La.
(Russell H. Nordwell, Richard D. House, Harold Sorgenfrei, Jr.)