

**STRATIGRAPHIC ANALYSIS AND THE SEARCH FOR OIL***by*L. L. SLOSS<sup>1</sup>**Abstract**

Stratigraphic analysis may be defined as a procedure based on the integration of stratigraphic data and leading to stratigraphic interpretations. Such interpretations may involve reconstruction of conditions and events in a given area during a specific span of geologic time and thus contribute to an understanding of paleogeography and historical geology. Or, analysis may yield interpretations in terms of the shapes, distribution, and interrelationships of bodies of rock, their internal constitution and their contained fluids, including oil and gas. In the sense employed here, stratigraphic analysis covers a broad field from purely academic inquiry to strictly practical petroleum geology, and it is impossible to draw a line separating these apparent extremes.

There are many approaches to stratigraphic analysis. One of the most fruitful has been the application of facies mapping techniques to the integration and interpretation of stratigraphic data. The facies-map approach requires selection of geographic area and scale, stratigraphic interval or units to be investigated, and the significant stratigraphic interval or units to be investigated, and the significant stratigraphic parameters or properties to be considered. Examples drawn from regional, semi-regional, district, and pool levels aid in an understanding of the problems raised by map scale, the spacing of control points, validity of correlations, and the objectives of the individual study.

Stratigraphers do not yet have a common body of experience relating to the interpretation of facies maps and the degree of agreement reached in terms of paleogeologic or structure-contour maps, for example, has not been attained. Nevertheless, principles of acceptable interpretation are beginning to emerge and it is possible to recognize a number of paleogeographic and tectonic features among facies patterns. More direct applications to oil exploration are found in the recognition and mapping of stratigraphic gradients related to migration and accumulation, patterns of source-reservoir interrelationship, and purely empirical comparison of known producing trends and inadequately explored areas or horizons exhibiting similar facies patterns. Emphasis in the present paper is placed on interpretation of facies maps and a variety of examples is presented to illustrate the diversity of patterns and conditions encountered.

<sup>1</sup>Northwestern University, Evanston, Illinois