the basic economic need of the petroleum industry which, simply, is a reliable, adequate, and continuous source of raw materials through new, large, domestic reserves.

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LET'S GET THE LAST DROP

The growing demand for petroleum resources, and the ever-increasing economic pressure to produce these resources at minimum cost, create a formidable challenge in the coming decade to look hard at currently used economic guidelines and success rates so that the petroleum industry as a whole may emerge from the 1970s in the strongest position it has ever enjoyed. Much has been said and written in the past decade about methods of calculating economic parameters for evaluating both wildcat and development wells, but the industry has missed perhaps the most significant aspect of the economic approach, that of improving the chances for success by more efficient drainage of reservoirs. Most currently used systems are based on results, empirically derived, from past performance. These by necessity normally include some rather broad assumptions. It is the purpose of this paper to direct attention to some ways in which our basic approach to the actual search for hydrocarbons might be altered to achieve the desired economic return by increasing the per well recovery.

Although there will undoubtedly be vast improvement in technique in the coming 10 years, the technology is already at hand which, if properly applied, should produce some rather dramatic results in the relatively near future enabling us more efficiently to drain "the last drop."

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PROSPECTING FOR OIL AND GAS IN MATURE AREA

The writer has had much experience in looking for oil in west-central Texas, a mature area of oil and gas development. The advantages of the west-central Texas area include ready markets, easily accessible locations, and fairly cheap leases. The west-central area is a good place to explore for hydrocarbons, particularly good for the independent company or individual.

Geologists can prepare themselves to become independent businessmen, and there are ways in which they might better cooperate with other segments of the industry to make exploration for petroleum not only easier but also more profitable.

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GENETIC CLASSIFICATION OF POROSITY FORMATION AND DESTRUCTION IN CARBONATE ROCKS

For a proper evaluation of the reservoir potentialities of carbonate rocks the exact causes of porosity formation and destruction need to be known. Such a genetic approach to a classification has to be practical enough to be applicable at the well site, yet sophisticated enough to allow meaningful interpretations. All old attempts at classification of porosity have been either descriptive or insufficiently accurate. For example, the term "leaching" is meaningless, unless it is specified if it pertains to subaerial leaching, or leaching accompanying recrystallization, or leaching resulting from dolomitization. An attempt is made herein to propose a genetic classification which has been tested in its applicability, both at the well site and in the laboratory.

There are basically 2 types of porosity—primary and secondary. Primary porosity developments were formed at time of deposition prior to diagenetic alterations of the sediment. Secondary porosity formations are introduced after deposition by early or late or even postdiagenetic activity.

Primary porosity may be subdivided into intergrain and intragrain porosity.

Secondary porosity formation may represent the following types: (1) subaerial leaching of the grains (moldic porosity) or the carbonate mud matrix; (2) recrystallization porosity, based primarily on (a) leaching accompanying the recrystallization process, (b) rearrangement of the crystal fabric (interstitial porosity), and (c) preservation of primary porosity by fast diagenetic hardening; (3) dolomitization porosity, based primarily on (a) leaching resulting from the dolomitization process, (b) volume reduction caused by a slight density difference between calcite and dolomite, (c) preservation of the primary porosity by fast diagenetic hardening, and (d) interstitial porosity created by dolomitization and subsequent recrystallization; (4) fracture porosity, either by itself or further enlarged by subsequent leaching.

Partial or complete porosity destructions in carbonates result primarily from (a) fibrous calcite wall linings, (b) sparry calcite precipitation, (c) sparry dolomite precipitation, (d) anhydrite and gypsum infills, (e) infilling by other evaporites, (f) infill by clay, silt, or sand, (g) infill by carbonate mud, (h) infill by isolated dolomite rhombohedra, and (i) collapse of the former depositional fabric.

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RÉSUMÉ OF SIGNIFICANT STUDIES OF CLASTIC SEDIMENTATION

Research on recent clastic sedimentation conducted by the petroleum industry, universities, and government agencies during the past 2 decades represents one of the most significant advances in the fields of stratigraphy and sedimentology. This research effort has provided geologists with conceptual models of eolian, alluvial, deltaic, coastal interdeltaic, and marine sedimentation. It has led to a better understanding of the depositional processes and related sedimentary sequences which characterize each model. Concepts and criteria necessary to interpret the origin and distribution of ancient sedimentary facies have been reasonably well established.

An analysis of the literature of recent sediments reveals that over 500 papers are now available for study, however the amount of research on processes and sequences associated with each depositional model has not been uniform. Emphasis has been primarily on deltaic, interdeltaic, and alluvial (meandering stream) environments. Considerably less research has been done on the higher energy alluvial-fan and braided-stream types of alluvial sedimentation and the normal marine (nonturbidite) environments.

The literature on depositional environments of ancient clastics, which now consists of over 600 papers, demonstrates quite clearly that results of modern sedimentation research have been applied to the study of older rocks on a very broad scale. An analysis of this literature reveals that about 50% of the published ma-