provinces may delineate more lucrative stratigraphic accumulations. Major unconformities can mask lucrative undiscovered structural or stratigraphic trends. Uneconomic fields often stand for years as lonely signposts indicating major new trends.

New looks at old provinces must shun prejudice as though it were the plague. Not only must one surmount entrenched management or client prejudice but, more important, those prejudices residing in one's own mind. All basic data must be reanalyzed to eliminate half-truths and ferret out new clues buried in voluminous data. Computer techniques facilitate handling the voluminous data of mature provinces, but should never replace an inquisitive geologic mind. Subsurface data should be integrated with the available but oft-ignored surface geology. Modern, stacked, seismic data, when integrated with up-to-date geologic models, prove many established concepts fallacious and indicate new concepts. Maps should integrate all available geophysical as well as geologic data. All geologic exhibits, even work maps, should show production causally related to the parameters portrayed. Regional maps should include related productive areas wherever possible.

Illustrations from various areas prove that the above techniques reward the explorationist who takes a new look at old provinces.

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Structural Setting of Black Sea

In the spring of 1969 a geologic and geophysical study of the Black Sea was made by the Woods Hole Oceanographic Institution. Echo-sounding profiles taken during the expedition, supplemented by published information, indicate that the continental shelf has its greatest development south of Odessa where it is more than 200 km wide. Elsewhere the shelf is less than 20 km wide. The continental slopes are about 1,800 m high, and are deeply entrenched by submarine canyons, except for the slope seaward of the Danube which is only about 1,000 m high and is relatively smooth. Seaward, the Danube fan has buried most of this slope and has prograded across the abyssal plain that occupies the central part of the Black Sea.

Continuous seismic profiles across the continental slopes generally show extensions of land structure, especially along the east coast, where ridges possibly related to the Caucasus Mountains trend across the shelf and slope. Some diapirs were observed off the Russian coast. Records from the abyssal plain generally showed it to be featureless, except near the continental slopes where considerable evidence of faulting and slumping was found.

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Sedimentation and Reef Development in Turbid-Water Areas of Fanning Lagoon

The term "coral reef" invokes, for most people, a vision of clear-water tropical seas. The clear water of this vision is not necessarily true. In Fanning Island Lagoon (3°54′N, 159°20′W) extensive thickets of *Acropora* and muddy sediments coexist at depths of 35 ft in water so turbid that a diver is not visible for more than 10–15 ft.

Three narrow passes connect the lagoon with the open ocean. A network of linear reefs divides the lagoon into several nearly isolated ponds. Lagoon waters are turbid except for an area around 1 of the passes. Coral abundance in the turbid-water area does not differ markedly from that in the clearer water. However, the corals of the clear water are mostly massive forms, while the turbid-water corals are ramose. Lush coral growth is present along the sides of the linear reefs as well as in thickets in the interreef ponds.

Linear reefs wider than about 50 ft have medial sand areas and there is a medium- to coarse-grained sand in the ponds along the reef edges. However, the major sediment in the lagoon is medium silt. The sediment particles are the result of physical and biologic abrasion of corals, mollusks, and calcareous red algae. Unlike many lagoons, Foraminifera and *Halimeda* are not important sediment contributors in Fanning Lagoon.

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Correlation of Mean Sizes Obtained from Size Measurement by Thin-Section and Loose-Grain Methods

Wicksell's or Krumbein's corrections based on probability of sectioning spherical grains at random can be used to yield loose-grain size moments from the observed thin-section size moments. Mathematical theory and experimental results clearly demonstrate that the probability of slicing spherical grains is directly proportional to their diameters (Wicksell's assumption) and not equal for all sizes as assumed by Krumbein. Therefore, correlating thin-section and loose-grain mean sizes (made dimensionless by dividing by 1 mm) by Wicksell's procedure and linearizing the equation by applying phi-transformation ($\phi = \log_2$) to both sides, one obtains

$$\phi(phm)_{n\,(\text{or } w)} = \phi(c)_{n\,(\text{or } w)} + \phi(\overline{B})_{n\,(\text{or } w)} + \phi(R.B.)_{n\,(\text{or } w)}, \cdots \quad (1)$$

where subscripts n and w represent number and weight (volume) frequency, respectively; where $R.B.$ is the residual bias

$$R.B. = \left[\left(\frac{\overline{D}}{\overline{B}} \times \frac{phm}{\phi hm}\right)\left(\frac{\overline{A}}{\overline{D}} \times \frac{dhm}{\delta hm}\right)\right];$$

hm is the harmonic mean; bar above letter indicates arithmetic mean; capital and small letters refer to loose-grain and thin-section sizes, respectively; Roman and Greek letters refer to sample and population values, respectively; P, p are projection (equal projection area and nominal sectional) diameters; A, a are long (circumscribing circle) diameters; B, b are short (inscribed circle) diameters (B is actually loose-grain intermediate diameter); Δ, D, δ, d are spherical diameters; $\phi(c)_n$ and $\phi(c)_w$ are Wicksell's correction constants having phi-values of 0.651 and 0.179, respectively. Nine multivariate linear correlation equations can, in general, be established between $\phi(Phm)$, $\phi(\bar{a})$, $\phi(\bar{b})$, and $\phi(\overline{P})$, $\phi(\bar{A})$, $\phi(\overline{B})$; where $\phi(c)_{n(\text{or } w)}$ is a constant. The correlation equation between $\phi(\bar{a})$ and $\phi(\bar{A})$, for example, is: $\phi(\bar{a})_{n(\text{or } w)} = \phi(c)_{n(\text{or } w)} + \phi(\bar{A})_{n(\text{or } w)} + \phi(R.B.)_{n(\text{or } w)} + \phi(\overline{B}/\bar{A})_{n(\text{or } w)} - \phi(phm/\bar{a})_{n(\text{or } w)}$.

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(No abstract submitted)