ever, the very slight folding of the upper 200–400 m of strata may simply be due to differential compaction that followed the intrusion.

The cores of the folds do not noticeably affect the magnetic field: hence, we doubt that they are igneous bodies. Nonetheless, an igneous origin cannot be discounted; the cores are close to late Tertiary and Quaternary volcanic and intrusive structures along the adjacent Aleutian Ridge, and near the historically active volcano, Bogoslov, which forms an island nearby. Shale or even salt cores may be present beneath the folds; however, salt diapirs probably would have to be derived from a deeply buried parent body of Paleozoic or early Mesozoic age. All the diapiric and diapirlike folds that have been found are along major structural trends; these trends delineate the principal physiographic elements of the southeastern region of the Bering Sea.

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Multichannel Filtering

(No abstract submitted)

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Economic Advantages of Subsea Production Methods

Most offshore development drilling and production has continued to use onshore technology and equipment. The development of a field in moderate water depths has been substantially more expensive than a comparable field onshore. Although costs per well continue to rise, in most cases they have remained within the economic limits required to justify the invested capital.

There does exist, however, for any given field, a water depth beyond which it is not economically feasible to consider development from fixed platforms.

The proper location of the platform in relation to the reservoir can be determined only by exploratory drilling. This location becomes increasingly important as the platform costs in deep water escalate. The costs add further to the penalty for attempting to meet the problems of deep-water development with conventional platform techniques.

There are economic attractions associated with ocean-floor installations that have not been fully realized. The minimization of the investment required prior to drilling, the installation of specialized sea-floor production systems, and the use of highly efficient maintenance units throughout the producing life of the field, all combine to present a solution to the recovery of petroleum from otherwise prohibitive locations.

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Statistical Analysis of Calcisiltites from Bird Spring Group, Mountain Springs, Nevada

Seventeen petrographic variables observed in duplicate thin sections for each of 62 calcarenites and calcisiltites collected from the Monte Cristo Limestone and the Bird Spring Group are the basis for this study. The samples are assigned to 6 microfacies, of which 31 and 17 belong to microfacies 0 and 1, respectively. R-mode cluster analysis grouped the variables into 7 clusters; 5 are composed of various organic and inorganic grains and associated alteration products, 1 is composed of acid insolubles, and 1 of sparite and micrite. Interclass and intraclass variation was tested by means of the Mahalanobis D^2 and associated F statistics. The null hypothesis was accepted for all diagonal elements and rejected for all nondiagonal elements. Initial clustering of raw- and transformed-data sets by means of Q-mode factor analysis—first using 17 primary variables, and then using 2 derived variables—indicated that the 2-variable case provided the best separation between microfacies 0 and 1. Null hypotheses concerning group dispersion and the equality of sample centroids were rejected for both the raw and transformed 2-variable case; consequently, an appropriate form of the T^2 statistic was employed to test for a significant difference between these two microfacies. Associated F values indicate a statistically significant difference between these microfacies for both raw- and transformed-data sets. Computed discriminant functions are approximately 98 and 79% efficient for the raw and transformed cases, respectively. The upper Monte Cristo Limestone was deposited under relatively stable environmental conditions that produced massive, low-energy micrites with very few biogenic grains. After an interval of erosion, the alternate quartzose sandstones and biomicrites of the lower Bird Spring Group were deposited under relatively unstable conditions. Environmental stability increased during the deposition of the upper Bird Spring Group, which consists of an almost unbroken sequence of micrites and biomicrites.

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Problems in Selecting Environmental Bench Marks for Remote Sensing Systems

(No abstract submitted)

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Interactive Computer Graphics and the Fault Problem

The treatment of faults is one of the greatest problems in the application of computers to petroleum exploration. Typically, too little information and too many alternative interpretations make analytic solutions economically unfeasible or otherwise unsatisfactory. Most computer techniques treat XYZ data points as though they are samples from a continuous surface. As a result, data points on opposite sides of faults are treated together with consequent distortion of analytically derived surfaces in the fault vicinity. Interactive computer graphics offers a solution. The geologist uses a light pen to interact with a series of graphic displays which enables him to (1) collect data on the position of fault surfaces from well logs, contour maps, and cross sections; (2) build numerical models of fault surfaces; (3) use the fault surfaces to separate data points on opposite sides of a fault; (4) build separate numerical surfaces from data points thus separated; (5) composite these surfaces with the fault surface to obtain a final model in which the surface is not distorted by the influence of points on opposite sides of the fault; (6) display the resultant model in the form of contour maps, cross sections, or perspective displays; and (7) iterate on the above process by altering