due to reworking of the submerged clastic Beaufort Formation cropping out along the western Arctic coast, and to occurrences of drowned headlands consisting of unconsolidated coarse materials.

Spectrochemical analyses indicate that certain elements and clay minerals in bottom sediments are related to nearby geological formations and that the clay minerals are detrital. This indicates past rigorous physical conditions with negligible chemical activity.

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THE SALT PLUGS OF SOUTHERN IRAN

The distribution of the south Persian salt plugs has encouraged observers in the past to connect these plugs with diagrammatic lines, suggesting deep-seated linear structural weaknesses. Little has been said about the associated anticlines, particularly as to whether or not they reflect the presence of an extensive, deep-seated salt body.

It is suggested in this paper, that the nature of the prominent 'whale-back' anticlines in the salt-plug region of the southern part of the province of Fars reflects the existence of an incompetent layer of salt at depth. Anomalous swings of strike and possible rim synclines give a characteristic pattern to the salt-plug area. This pattern contrasts strongly with an area in N.W. Iran (Lurestan) which, although having similar 'whale-back' anticlines, lacks anomalies of strike, and shows no surface outcrops of salt.

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FLUID-RELEASE MECHANISMS IN COMPACTING MUDROCKS AND THEIR IMPORTANCE IN OIL EXPLORATION

Our current knowledge of clay colloid chemistry and clay mineralogy was applied in an investigation of the mechanisms by which water escapes from muddy sediments. The alteration of montmorillonite to illite after deep burial involves the transfer of large amounts of water from bound positions on montmorillonite to interparticle areas where it has an important bearing on the porosity, permeability, abnormal fluid pressure, and the initial release of hydrocarbons from mudrocks.

In contrast to montmorillonitic deposits, water is compacted out of illitic deposits very soon after burial, before the formation of hydrocarbons comparable to those found in reservoirs. The development of shale source rock requires the initial deposition of a montmorillonitic organic mud, and its subsequent alteration after deep burial to illite. These requirements are of decisive importance in the exploration for oil in new areas.

A considerable reduction in density accompanies the desorption of the last few monomolecular layers of water from montmorillonite during its diagenesis to illite, and the associated volume increase could easily account for the abnormally high fluid pressures so often encountered in drilling operations.

The new compaction theory enables us to give meaningful interpretations to data on the bulk properties of compacting mudrocks.

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ENVIRONMENTAL SIGNIFICANCE OF FOSSIL ALGAE

During the past decade, a great deal of interest has developed in the use of algae as environmental indicators. As a consequence, many fossils have been identified as algae in the published record and used as the basis for environmental interpretation. Some of these fossils may not be algae and others may be algae without environmental significance. This paper is a plea to paleontologists and geologists to be more critical in their identification and utilization of fossil algae. At the present state of our knowledge concerning these fossils, only a few can be used with any confidence for environmental interpretation.

Algae as a group may inhabit almost any environment. For example, coralline algae in the Recent seas range from the equator to the Arctic Ocean and from the intertidal zone to depths of several hundred feet. Too little is known regarding the distribution of modern genera and species to permit us to attach any environmental significance to the fossil forms.

Probably the most misused forms are the algal stromatolites. Structures of varying origins ranging from caliche to diminutive normal marine bioherms have been called algal stromatolites and interpreted as being intertidal in origin. This practice limits the usefulness of algal stromatolites for environmental interpretation.

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GEOTECHNICAL ASPECTS OF RECENT MARINE SEDIMENTS, OSLOFJORD, NORWAY

Improved fixed-piston and gravity-type, thin-wall corers designed and built at the Norwegian Geotechnical Institute were used to sample localities selected by a sub-bottom, echo-sounding survey in an integrated geochemical, geological, geophysical, and geotechnical investigation of the Oslofjord. Changes in mass physical properties, particularly grain size and bulk density, were correlated with near-surface acoustic reflections from specific sub-bottom strata. Shear strength of the fine-grained, cohesive sediment was measured in the laboratory using the new Norwegian unconfined compression apparatus and the Swedish fall-cone. The latter instrument is of particular value for the scientific study of the strength of soft, Recent marine sediments because of the small amount of material necessary for a valid test. Natural strength was found to be strongly influenced by the remains of polychaete burrows, the extent of which was demonstrated by radiography. Sediment sensitivities generally were medium to very sensitive, but in a few instances were quick. All material had normal fjord pore-water chlorinities (about $19^{\circ}/_{\circ\circ}$), and the quick character of the clay appeared related to an abnormally high content of calcium carbonate. The sediments were underconsolidated above a depth of approximately one meter.

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PRESENT STATUS OF GEOLOGICAL STUDIES IN THE ALASKA RANGE

After more than one-half century of geological study in Alaska, the geology of the Alaska Range remains imperfectly known. This has resulted from emphasis on areas of greater economic potential, such as north of the Brooks Range and Cook Inlet. However, recent geological studies in the eastern Alaska Range by faculty and graduate students at the University of Alaska are now adding substantially to our knowledge of this region.