ly to the opening of the lower Cook Inlet by the Federal government for leasing, probably sometime in 1968. The areas of prime interest in Alaska today, and probably for the next few years, are lower Cook Inlet, Arctic North Slope, Bristol Bay, and Gulf of Alaska. It is interesting to note that 21 companies participated in a geophysical survey of Bristol Bay in 1966 and 20 companies participated in another survey in the Gulf of Alaska also in 1966. More and more, industry is finding that it behooves companies to join, where possible, to reduce the extremely high costs of operating in these areas. Alaska should continue for many years to be one of the important oil exploration areas in the United States.

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RELATIONSHIPS BETWEEN GEOLOGISTS AND GEOPHYSICISTS

The treatment of this subject is best developed by one who has been on both sides and in the middle. The problem (briefly stated) is the general feeling that the two disciplines are not mutually appreciative of each other and are, therefore, less effective as an exploration team than would otherwise be the case.

One must understand that, as long as exploration continues to change, to foster the introduction of new methods, and to use men trained in a wide variety of specialties, complete mutual appreciation should not be expected. Complete appreciation will be possible only when the exploration industry is stagnant. It is management's business to optimize the situation by vigorous use and continuous training of earth scientists, and it is everybody's business to avoid unreasonable attitudes and statements.

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EDUCATIONAL PROGRAMS OF AMERICAN GEOLOGICAL INSTITUTE

The American Geological Institute sponsors more than a dozen educational programs which are aimed at everyone from grade-school children to professional geologists. Among these are the Encyclopaedia Britannica Film project, a program which is developing an extensive set of films and film strips on aspects of geology and the other earth sciences; the Geology and Earth Science Sourcebook, designed as an aid to teachers on earth science; the Earth Science Curriculum Project for secondary school students, A.G.I.'s most extensive educational project; the Visiting Geological Scientist Program which has sent between 45 and 65 visitors to an average of 100 college departments every year since 1959; the International Field Institute which provides opportunities for college geology teachers to visit foreign areas of classic or unusual interest under the guidance of distinguished geologists; 3-day short courses held just before national meetings of the G.S.A. and designed to update professional geologists in some specific area of competence; and the Council on Education in the Geological Sciences whose purpose is to help improve geological education in American colleges and universities through publications, materials development, and by other means.

In addition to these major projects, A.G.I. publishes two career books—one for high school and one for college students; answers more than 3,000 letters a year on careers; provides a job-placement service for those seeking jobs of a temporary nature; and is putting out a basic bibliography of books, maps, and references essential for an undergraduate geology library.

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SHELF TO DEEP-SEA SEDIMENT TRANSPORTATION IN THE GULLY SUBMARINE CANYON OFF NOVA SCOTIA

Submarine canyons on the Atlantic continental margin off northeastern North America received large amounts of fluvial and fluvio-glacial sediment from emerged shelves during glacial stages. It has been stated that the supply of sediment to canyon heads, especially to those located far from coast lines, was virtually cut off after the Holocene sea-level rise, and that at the present time there is little sediment movement down these canyons. An examination of numerous piston cores collected in The Gully, the largest canyon on the highly dissected continental slope off Nova Scotia, Canada, indicates that the above generalizations do not apply to all canyons of this region.

The Gully heads on the outer Scotian shelf between Sable Island and Banquereau Banks, more than 100 nautical miles from the mainland. The Gully trends downslope southeastward in sinuous fashion for a distance of 35 miles to a depth of about 1,400 fathoms. The canyon is V-shaped and the walls are steep with gradients of 1 on 2. The longitudinal gradient ranges from 1 on 9 to 1 on 18. Small, precipitous tributary canyons enter the main canyon, especially along the west wall.

Long cores collected at the base of the slope show an upward change in coloration from red (reworked till origin) to gray and olive (post-glacial). The number of coarse strata increases with depth, indicating that sediment rates decreased after the last rise in sea-level. However, the sediment sequence along the canyon length is proof of modern active sedimentation. Lenses of relatively clean sand in the upper reaches and near the steep walls of lateral tributary canyons are clearly derived from adjacent banks on the basis of mineralogy and faunal composition. Normal bottom currents, slumps, and sand flows probably moved these materials. In the same areas, contorted lenses of silty and sandy clay abound; localized slumping toward the canyon axis is the most important downslope transportation process. Pockets of sand and gravel, lying above mud in the canyon axis, and scour structures indicate that coarse clastics presently are being funneled downslope along the axis. Graded layers, 1–10 centimeters thick, are uncovered within the canyon and correlation is not possible between adjacent cores. Turbidity currents presumably are active in moving some material to the deep sea but, in this area, are of lesser importance than either slumps or bottom currents.

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UNIQUE PLAYA SCRAPER AND FURROW NEAR MCKITTRICK, CALIFORNIA

An unusual occurrence of a well-defined playa scraper and furrow in a small playa-like area was observed near McKittrick, California. A 20-foot fill, made during construction of California Highway 30, blocked a broad drainage channel in the low hills south of McKittrick. Small, flat, mud-cracked clay surfaces much like the familiar desert dry lakes developed on either side of the highway fill. The playa-like area east of the highway, where the occurrence was noted, is approximately 230 feet wide and 300 feet long.

The playa scraper, which was part of the fill material, is a crudely ellipsoidal boulder of quartz conglomerate weighing about 175 pounds. Movement was from close to the fill embankment along a slightly arcuate path for a distance of 99.2 feet toward the outer margin of the dense clay surface. The playa furrow developed on the still-moist surface is 20 inches wide, its edges having been raised ½ inch above the level of the surrounding area. Depth of the trail increased from 2 inches at the starting point to 2½ inches at the terminus. Mud pushed by the moving boulder was left as a low mound of dry clay in front of the scraper.

Movement of the scraper by wind does not seem to be a feasible explanation. Not only is the area sheltered from air currents, but the direction of movement is nearly at right angles to, and away from, the protective embankment. Transportation by ice floes is equally difficult to defend because the McKittrick area is one of rare freezes and it is doubtful that, even if freezing did occur, the thickness of ice formed would be sufficient to move a 175-pound boulder. Hydraulic action promoted by a drain beneath the fill is suggested as the possible motivating force for the McKittrick scraper. A similar occurrence at the Racetrack Playa in Death Valley, California, supports this supposition.

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NATURE AND RECOGNITION OF LIMESTONE TURBIDITES, MARATHON REGION, TEXAS

The Dimple Limestone (Pennsylvanian) of the Marathon region represents a period of carbonate deposition which interrupted the deposition of a thick terrigenous flysch section in the Ouachita geosyncline. It consists from north to south of laterally adjacent shelf, slope, and basin facies. The shelf facies is characterized by cross-bedded oölith carbonate grainstone. The slope and basin facies consist of sequences of distinctive limestone turbidite. Paleocurrent analysis indicates the existence of a uniform paleoslope dipping southward, with no apparent slope break.

Slope-facies turbidites (proximal turbidites) display a wide variety of internal characteristics. They may be graded, reverse graded, or non-graded in their lower parts, but grade abruptly in their upper parts. Basal parts commonly are conglomeratic, and carbonate-mudstone upper parts commonly are absent. Floating pebbles are common, and 3-foot-thick cross-bedded units have been observed. Small-scale cross-bedding is rare, and large-scale convolutions are abundant. Associated rocks are subaqueous slump conglomerate, spicular carbonate mudstone, and black spicular marl. This facies is 5 miles wide.

Basin-facies turbidites (distal turbidites) are nearly always graded. Pebbles are scarce, and the coarsest sizes are sand or silt. Carbonate mudstone beds are well developed, and were deposited from turbidity currents because (1) thick mudstone beds overlie thick graded beds, and (2) the normal pelagic sediment is radiolarian-bearing marl. Small-scale cross-bedding is abundant and convolutions are common. Thick beds are commonly massive, becoming laminated and cross-bedded on a small scale upward. Thin beds are commonly laminated. Associated rocks are black radiolarian-bearing marl and spicular chert.

Information gained from the Dimple Limestone was applied to lower Paleozoic rocks in the region, and revealed slope-and-basin-facies limestone turbidites in the Ft. Pean Formation and Maravillas Chert (Ordovician).

It appears that some geosynclinal limestone turbidite is the product of major tectonism, and is introduced from the cratonic side.

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AUSTRALIA, GEOPHYSICAL EXPLORATION, AND GREAT ARTESIAN BASIN

Petroleum exploration began in the Great Artesian basin of Australia in 1900 with the recovery of a strong flow of gas from a depth of approximately 3,500 feet in a hole drilled on Hospital Hill at Roma, Queensland, in an attempt to strengthen the town's artesian water supply. Drilling, both sporadic and intense (including 20 holes in the boom exploration year of 1929), has continued in the area through the years.

The lack of significant surface outcrops in much of the basin, and an unconformity at the base of the Mesozoic cover, made structural analysis by means of surface studies difficult, if not impossible. At the request of the exploration companies still operating in the Roma area in 1947, the Bureau of Mineral Resources carried out magnetic and gravity surveys and two experimental seismic surveys from 1947 to 1953. Electric logging of test wells was begun in 1954 but, by the mid-1950s, few of the basin's structural or stratigraphic problems had been solved.

Encouraged by liberal concession terms and government subsidies, serious geophysical exploration was started by the Australian-owned Associated Group in 1959. Major world oil firms joined the search in 1960 and the exploration techniques developed in other parts of the world were brought to bear on the problems of the basin.

Geophysical data, augmented by information from many test wells, have made it possible to "strip" the Mesozoic mantle from the basin and have disclosed not a single large basin but many basins. The commercial return from a large exploration investment has been disappointing to date but the chapter is not yet complete. Gas has been found in abundance, yet the Moonie field remains the only oil field of consequence. Moonie and Alton oil are reaching the market but gas still awaits a gathering network of pipelines.

The structural and stratigraphic framework of this great basin is still being drawn from a decelerated program of geophysical exploration. Somewhere within the assemblage of data probably lies the key to discovery of a major oil field which, when found, will provide the impetus for completion of the geophysical-geological mapping job.

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NOMENCLATURE FOR SEDIMENTARY ROCKS

Despite the many excellent papers on classification of sedimentary rocks, there is still so much loose and variable usage of names that it is not possible to be certain—or, at times, to have even a good notion—of the intended meanings of names found in the literature. If intelligible communication contributes anything to progress in sedimentary petrology, then the existing state of affairs must constitute an appreciable drag on progress. This paper is presented to re-draw