A detailed graphic logging method which shows *all* sedimentary properties in a semi-quantitative way has been developed and used in studies of various formations. Field and laboratory data are shown. Paleontological, petrographical and other data as Schlumberger logs can be added. It can be used for presentation of well logs.

At present our main purpose is to collect a series of standard detailed graphic logs of known fossil environments. They will form a base for comparison. Logs taken from similar environments have the same petrographic and paleontological properties. A second aim is to determine if petrological properties alone will be sufficient to fix the kind of environment.

A number of profiles taken from shallow and deep water environments will be shown. They include the Molasse from Switzerland, Upper Devonian from Germany and Belgium, turbidity current deposits (Flysch) from the South of France and the Apennines in Italy, coal measure deposits from Belgium and modern estuaria deposits from Holland.

The study of recent sediments should be made by borings from which undisturbed, oriented cores have been collected. Lacker or plastic films show the structures very well, and enable to draw graphic logs for comparison with old deposits.

STRIKE-SLIP FAULTS

MASON L. HILL

The San Francisco earthquake of 1960 attracted attention to strike-slip faulting. Later work indicates the possibility of accumulative right lateral-slip of at least 350 miles on the San Andreas. There are many other examples of faults on which geologic evidence shows similar displacements of great magnitude. Seismic solutions show a preponderance of strike-slip in causing large earthquakes. Correlation of magnetic surveys has suggested many miles of strike-slip on oceanic faults. Paleomagnetic pole positions might (?) be explained by strike-slip faulting. Accelerated progress in geotectonics requires a revamping of fault classifications.

STRATIGRAPHY AND STRUCTURAL HISTORY OF THE CANADIAN ARCTIC ARCHIPELAGO

DR. RAY THORSTEINSSON

The Arctic Archipelago has a land area of about 525,000 square miles of which some 300,000 are Phanerozoic rocks.

Seven major structural elements are recognized: they are described from southeast to northwest.

(1) A probably Tertiary volcanic province, covering a small part of southeastern Baffin Island.

(2) The Precambrian Shield that is exposed over large areas of southeastern and eastern parts of the Archipelago. Extensions of Shield form two and possibly three cratonic arches within the Arctic Lowlands.

(3) The Arctic Lowlands which are characterized by essentially undisturbed and relatively thin coverings of Cambrian, Ordovician, Silurian and Devonian strata. Cretaceous to early Tertiary rocks are exposed in the Lowlands of Banks Island. The Arctic Lowlands are situated between exposures of the Shield and the Franklinian

Geosyncline. They extend from Banks Island to central east Ellesmere Island. Most exposures throughout this vast area represent a dolomite formation that bears the Arctic Ordovician fauna and ranges into the Silurian.

(4) The Franklinian Geosyncline that represents a region of profound subsidence from Cambrian to Devonian. Miogeosynclinal facies characterize that part of the geosyncline adjacent to the Arctic Lowlands and extend through Melville, Bathhurst, Cornwallis, northwest Devon, and southern and eastern Ellesmere Island. Within the miogeosyncline, Cambrian, Ordovician and Silurian rocks attain a maximum thickness of about 20,000 feet and are essentially carbonates and shales with minor evaporites and sandstones. Ordovician and Silurian carbonates occupy the inner side (nearest the Shield) of the miogeosyncline, and shales the outer. Middle to early late Devonian rocks are locally 17,000 feet thick and represented mainly by quartzose clastics and lesser carbonates. The part of the Franklinian Geosyncline exposed in northern Axel Heiberg and Ellesmere Island is eugeosynclinal in character. The geology of this region is poorly known. Nevertheless, low rank metamorphic equivalents of sandstone, greywacke, siltstone, shale, chert and carbonate rocks are known to be represented. Locally these rocks attain a maximum thickness of about 40,000 feet. Volcanic rocks are also present. In northwest Ellesmere, volcanic rocks are about 30,000 feet thick and lie stratigraphically above Silurian graptolites. The rocks of the eugeosyncline have yielded only a few poorly preserved fossils of Ordovician and Silurian age. Gneissic rocks exposed on the north coast of Ellesmere are approximately 545 million years old on the basis of radiometric age determinations. Their structural relation to the Ordovician and Silurian in this region is unknown. Stocks of granite, norite, and peridotite intrude the gneissic rocks. *Early Palaeozoic movements* (late Silurian or early Devonian) produced north-trending folds on Cornwallis and eastern Bathurst Islands and probably also Grinnell Peninsula. Movements along the Boothia Cratonic Arch also took place at this time and produced northerly structures and contemporary fanglomerates on Somerest and Prince of Wales Islands. *Mid-Palaeozoic movements* affected the remainder of the miogeosyncline and produced east-west trending folds on Melville and Bathurst Islands, the Grinnell Peninsula; and northeasterly trending folds that extend from southwest, and through central Ellesmere Island. The strike of the severely deformed eugeosynclinal rocks is northeasterly in northern Ellesmere; northerly in northern Axel Heiberg. Throughout the Geosyncline the deformed rocks are overlain unconformably by Middle Pennsylvanian rocks. Deformation therefore, took place between early Late Devonian and Middle Pennsylvanian. The Minto Arch of Victoria Island probably underwent uplift at about the same time. Rocks of late Devonian, late Mississippian and Early Pennsylvanian age are unknown in the Archipelago.

(5) The Sverdrup Basin is centered in southwestern Axel Heiberg Island and extends from northern Prince Patrick Island to northern Ellesmere Island. It is filled with Middle Pennsylvanian to early Tertiary sediments that are separated from Rocks of the Franklinian Geosyncline by a profound unconformity. The long axis of the Sverdrup Basin appears roughly to coincide with, and parallels, the transition zone between the lower Palaeozoic miogeosyncline and eugeosyncline. The Permo-Pennsylvanian includes carbonate, shale, sandstone and evaporites; the Mesozoic comprises alternating marine shale and non-marine sandstone. The region of the axis of the Sverdrup Basin is characterized by a conformable sequence that reaches a maximum thickness of the order of 50,000 feet. Along the margins of the Basin the sequence is much thinner, and incomplete, mainly from unconformities and overstep. Early Tertiary rocks are entirely non-marine with coal seams. They were followed by *Tertiary earth movements* that produced mainly northerly trending thrust faults and folds, and also diapiric intrusions of upper Palaeozoic evaporites. In northwestern Melville Island and southwestern regions of Ellesmere Island an angular

unconformity *(Late Palaeozoic earth movement)* separates Middle Pennsylvanian and Early Permian rocks, but this deformation does not appear to have affected the main body of the Sverdrup Basin.

(6) The Prince Patrick Uplift includes southern Prince Patrick Island and a small part of the northern extremity of Banks Island. The Uplift appears to involve an inlier of Devonian rocks that are cut by north trending normal faults, and there is evidence that the Uplift experienced repeated movements within the Mesozoic. It is suggested that the structures exposing late Precambrian rocks at Nelson Head on the south coast of Banks Island are related to the Prince Patrick Uplift, and that both regions represent culminations along a largely buried Precambrian structural high analagous to the Boothia and Minto Arches.

(7) The Arctic Coastal Plain, a narrow strip of late Tertiary and early Pleistocene non-marine clastic sediments that borders on the Arctic Ocean and extends from Banks of Meighen Island. These sediments (Beaufort formation) rest unconformably upon all older formations and dip gently to the northwest. Relatively recent faulting has probably taken place. This is indicated by the presence of probable faults displacing the Beaufort formation and by many straight and arcuate coast lines that strongly suggest fault-line scarps.

THE POSITION OF THE GEOLOGIST IN THE OIL INDUSTRY TODAY

H. T. MORLEY

Current conditions of oversupply have depressed the oil industry, curtailed exploration operations, and have created not overly promising prospects for geologists as well as others in the industry. This is a short-term situation, however, when viewed against the growth of populations and economies around the world, and the consequent projections of demand in relation to supply. These projections indicate that in the foreseeable future our current oversupply could well be reversed into a definite shortage. It is most important that the industry be left free to maintain and step up its activities to insure adequate future supplies.

A number of factors pose serious threats to the long-term prospects of the industry. Among them are (1) the continuing pressure against percentage depletion, (2) Federal controls over natural gas production, and (3) the thinly-disguised efforts of the coal industry to obtain, through government action, end-use controls over fuels.

The nature of these threats, and the implications of socialism which they contain, are of immediate concern to each of us. It therefore behooves geologists as professional people to participate personally and actively in efforts to explain and interpret the industry to consumers, public officials and others whose opinions influence the legislation under which our industry must operate. Too many in our nation have lost sight of the fact that individual enterprise has been the principal factor in the rise of this nation, and that socialism has been a dismal failure wherever it has been tried.

If each one of us, believing strongly in the dignity and worth of the individual and certain that a free competitive economy can create markets and jobs for all, will work continually in our own way to convince others of our beliefs, the results may well be astounding.