VELOCITY INVESTIGATIONS USING DYNAMIC CORRELATIONS

(No abstract submitted)

CASEY, RICHARD E., San Fernando Valley State College, Northridge, Calif.

RADIOLARIANS AND PALEOCEANOGRAPHIC INTERPRETATIONS

Recent studies on living polycystine radiolarians show that certain members of this group are either endemic or, at least, dominant to specific water masses. Other polycystine species, with wider distributions than the aforementioned species, illustrate subspecific morphologic changes that can be correlated with specific geographical regions. Entire faunal assemblages show distinct patterns, many of which may be correlated with such oceanographic features as convergences, divergences, current systems, eddies, pycnoclines, and depths.

Because polycystine radiolarians with both long and short geologic ranges are abundant in the fossil record, this study provides a promising new avenue for making paleoceanographic interpretations.

COLBURN, IVAN P., California State College at Los Angeles, Los Angeles, Calif.

PALEOCURRENT PATTERNS IN UPPER CRETACEOUS BEDS OF MARSH CREEK FORMATION OF NORTHERN DIABLO RANGE, CALIFORNIA

Cretaceous turbidite beds that crop out along the northeastern flank of the Diablo Range between Altamont Pass and Mount Diablo exhibit numerous paleocurrent features.

More than 400 pieces of paleocurrent data from sole marks, sand grain and conglomerate clast fabrics, carbonaceous fragment orientation, and parting lineations collected from outcrops within a 300-sq-mi area were used to deduce that the trend of the ancient currents which deposited these beds was from northwest to southeast.

The majority of the beds studied dip homoclinally northeast into the San Joaquin Valley. Therefore, the paleocurrent analysis was dominantly two dimensional for each time-stratigraphic interval in the section.

The sequence studied is more than 20,000 ft thick and ranges in age from Maastrichtian to Turonian, but a few localities may be as old as Aptian. Dating of the beds was based mainly on microfossils, but a few ammonites and other diagnostic Upper Cretaceous megafossils also were found.

A change in thickness of the sequence from about 10,000 ft to more than 20,000 ft takes place along the strike of the beds from near Mount Diablo in the northwest corner of the area studied to Altamont Pass in the southeastern part of the area.

Current trends observed near the base of the section show little deviation from those noted higher up and, therefore, the pattern of current flow must have remained static in this area for the duration of Late Cretaceous time.

Deviations from the general paleocurrent pattern were observed in some of the paleocurrent features studied, but the number of these deviations is minor compared with the majority of the data collected.

DIBBLEE, T. W., JR., U.S. Geological Survey, Menlo Park, Calif.

REGIONAL GEOLOGIC MAPPING ALONG SAN ANDREAS FAULT AND VICINITY, CALIFORNIA, BY U.S. GEOLOGICAL SURVEY

Since 1965 the U.S. Geological Survey has been systematically mapping the geology of a strip about 40 mi wide and 500 mi long along the San Andreas fault. The geology is being compiled and mapped on seven 80-mi-long segments, one after the other, on a topographic base prepared at a scale of 1:125,000 (1 in. = 2 mi). This involves field checking of available geology and mapping areas inadequately mapped or unmapped.

Geologic mapping has been completed for the first segment, which extends from Cholame to Elkhorn Hills, and includes the Pyramid Hills, Reef Ridge, Orchard Peak, Temblor, Caliente, La Panza and Sierra Madre Ranges, Carrizo Plain, and Cuyama Valley.

Regional mapping of this segment resulted in slight revision of the stratigraphy. The Pliocene marine section along the west border of the San Joaquin Valley is mapped as the Etchegoin Formation and is divided into three members where divisible. In the Sierra Madre and La Panza Ranges, the enormously thick marine clastic section of Late Cretaceous(?) age is now believed to be of Paleocene and Eocene ages. East of the San Andreas fault the thick Cretaceous marine section above the Franciscan Formation is divided into three formations.

EDWARDS, C. M., United Geophysical Co., Pasadena, Calif.

GEOPHYSICAL INSTRUMENTATION FOR MARINE RECONNAISSANCE SURVEYS

(No abstract submitted)

FAZIO, PATRICK J., McCulloch Oil Corp., Los Angeles, Calif.

LIVERMORE OIL FIELD, CALIFORNIA

(No abstract submitted)

FLETCHER, GERALD, Atlantic Richfield Co., Denver, Colo.

STRATIGRAPHIC EVIDENCE OF POST-EARLY LATE MIOCENE RIGHT-LATERAL DISPLACEMENT ALONG CENTRAL PART OF SAN ANDREAS FAULT ZONE, CALIFORNIA

(No abstract submitted)

FULMER, CHARLES V., Space Division of the Boeing Co., Seattle, Wash.

STRATIGRAPHY AND CORRELATION OF TYPICAL BLAKELEY AND BLAKELEY HARBOR FORMATIONS OF WASHINGTON

During the past 50 years the original formational term "Blakeley" has been employed to denote lithologic, stratigraphic, biostratigraphic, and chronologic parameters. The multiplicity of this usage has resulted in considerable confusion with respect to the typical lithologic character, faunal composition, correlation, and time-rock nomenclature. This paper defines and restricts the lithologic character of the Blakeley Formation and records the lithologic and biologic mixing that has taken place during the deposition of this formation.

The uppermost part of Weaver's type Blakeley Formation was deposited in a nonmarine environment and is lithologically distinct from the underlying strata. It appears advisable, therefore, to restrict the Blakeley Formation to the marine-deposited strata and to rename the superjacent unit.

GRYC, GEORGE, AND EDWARD H. COBB, U.S. Geological Survey, Menlo Park, Calif.

Review of Trends in Development of Alaskan Mineral Resources

The exploration and development of Alaska's mineral resources have fluctuated greatly from "rushes" of activity to virtual extinction. The first attempt to mine gold in Alaska began in 1848, and by 1882 several lode mines were in production. By 1906 ten copper mines were operating in southeastern Alaska, and copper and gold have accounted for about 95 percent of all of Alaskan metallic mineral production.

During World War I, production of all metals began to decline and reached a low during the period of 1929–1933. The world-wide depression and the re-evaluation to $35 per oz in 1934 heralded a new upswing in gold production which reached an all-time high in 1940. The depletion of copper reserves and again the exigencies of another war virtually closed down metal mining in Alaska by 1944. However, military construction during and after World War II, and the discovery of oil in Cook Inlet in 1957 brought two new leaders to the minerals industry—sand and gravel, and petroleum.

Of the approximately $85 million total mineral production in Alaska in 1966 petroleum accounts for more than $50 million, sand and gravel about $21 million, coal about $6 million, and gold slightly more than $1 million.

Now a new government activity, the Heavy Metals Program, aimed principally at stimulating the production of gold and certain other critical metals appears to be ushering in a new period of interest in metallic resources. This interest is influenced strongly by continuing prospecting and discovery in nearby parts of Canada and by the mineral requirements of Japanese industry.

GUSSOW, WILLIAM C., Union Oil Company of California, Brea, Calif.

Accumulation of Reservoir Fluids

The principle of differential entrapment, first published in 1953, is reviewed and updated, and geological evidence for selective trapping of oil and gas is illustrated with many kodachrome slides. This theory explains why many good traps are dry whereas adjacent structures are prolific oil fields. It explains why some traps are gas fields and contain no oil, and why gas is trapped downdip in some areas whereas oil occurs in synclines in other areas. The law of gravity explains the gravity distribution of gas, oil, and water in a reservoir, but differential entrapment explains why some oil reservoirs are stratified.

Oil and gas accumulations are modified under superimposed hydrodynamic conditions in accordance with the hydrodynamic gradient, causing tilted interfaces, spilling, and remigration. When folding and faulting are superimposed on a basin with oil and gas accumulations, the oil and gas usually remigrate into the new structures in accordance with the principle of differential entrapment, and these new accumulations conform to the existing hydrology.

Undersaturated oils, gas-oil ratios, and the origin and significance of saturation pressures are discussed.

HAAS, MERRILL, Humble Oil and Refining Co., Houston, Tex.

Frontiers in Micropaleontology

The role of micropaleontology is expanding as need for more sophisticated exploration techniques increases. In addition to age dating and correlation, micropaleontology now provides geologists with paleoenvironmental and paleobathymetric maps to locate depocenters, predict occurrences and trends of reservoir facies, determine shore-shelf-slope relation, and establish times and location of structural growth. Faunal assemblages provide clues to unconformities, faults, missing sections, and other events otherwise not readily recognized.

Although knowledge and application of microfossils have expanded greatly in recent years, frontiers for research are numerous and challenging. Gaps still exist in our understanding of many fossils. A useful synthesis of what is known about particular groups often is lacking. Environmental controls, the significance of the rare event, and the impact of worldwide geologic events on faunas are not completely understood. Better preparation techniques and more powerful tools such as the scanning electron microscope open new vistas for analysis and understanding. EDP provides a major challenge, both in speeding the work of stratigraphers and in bringing together for their use the vast storehouse of knowledge already existing. Micropaleontology will play an increasingly important role in exploration as research resolves these challenges.

HAYE, EDWARD F., Photogravity Company, Inc., Houston, Tex.

Photogeology and Geophysics

Reducing oil-finding costs by maximum coordination and greater usage of the less expensive exploration methods is discussed. The utility of coordination, and specific gravity and photogeologic applications, are documented with pertinent illustrations.

There are many ways in which surface geology can be useful to geophysics, not only as an aid to structural interpretation, but also in refining the accuracy and improving the efficiency of geophysical methods. The vast majority of geophysical work has been accomplished in relative ignorance of the surface geology. Many specific examples of misinterpretation and waste can be attributed to a lack of consideration of surface geology. Because of this historical lack of surface-geologic consideration, there is a large reservoir of data which can be "high graded" and refined very inexpensively. Photogeology is by far the most rapid, effective, and inexpensive way to do surface geology.