for its emplacement would have had a $\delta^{18}O$ value of approximately +12 ‰. These data suggest that the mineralized quartz veins formed from fluids derived from the Valdez Group during metamorphic dewatering.

PLUMLEY, PETER W., Univ. California, Santa Cruz, CA, and I. L. TAILLEUR, U.S. Geol. Survey, Menlo Park, CA

Paleomagnetic Results from the Sadlerochit and Shublik Mountains, Arctic National Wildlife Range (ANWR), and Other North Slope Sites, Alaska

Carboniferous through Triassic sedimentary units exposed in the Shublik and Sadlerochit Mountains were sampled in an attempt to obtain reliable primary magnetic components. Reliable pre-Cretaceous paleomagnetic poles from this area would greatly advance the understanding of the rotation and latitudinal displacement history of the North Slope.

Carbonate rocks of the Carboniferous Lisburne Group were drilled in south-dipping units of Katakturuk Canyon, Sadlerochit Mountains, and in the north-dipping Fire Creek section, Shublik Mountains. Magnetic cleaning involved stepwise thermal demagnetization to 550°C. Principal component analysis of the demagnetization results defines two major components of magnetization. The secondary component is steep and down (inc = 87°), but the characteristic component (325°C-500°C) is reversed. The secondary magnetization postdates Cretaceous and younger folding, whereas the characteristic component was acquired before folding. The components may have recorded two phases of overprinting: a Late Cretaceous into Cenozoic normal overprint and a predeformation remagnetization episode during a time of reverse polarity. However, the reverse component more likely is primary remanence. If so, it would suggest little latitudinal displacement but 40° of clockwise rotation with respect to North America.

The Devonian Nanook Limestone, sampled in the Shublik Mountains, also reveals two major components of magnetization; however, the characteristic component is isolated at blocking temperatures greater than 500°C and is shallower in inclination than expected from the Devonian reference pole for North America.

The recovery of the reversed characteristic component in this study is a significant result by itself. It is good evidence that at least part of the northeast Brooks Range has escaped the thorough Cretaceous normal-polarity overprinting that has been observed in the north-central Brooks Range. We hope that analyses of additional samples from the Katakturuk Dolomite, Nanook Limestone, Lisburne Group, Sadlerochit Group, and Shublik Formation in ANWR and from the Triassic and Jurassic Otuk Formation in the east-central foothills will also discriminate pre-Cretaceous magnetizations and will provide constraints on the time they were set.

PRINDLE, DAVID B., Geoph. Inst., Univ. Alaska, Fairbanks, AK

Marine Magnetic Survey of Kachemak Bay, Alaska

Kachemak Bay in south-central Alaska is approximately 38 mi (60 km) long and 13 mi (20 km) wide at the mouth. Geologically, Kachemak Bay marks the boundary between the Mesozoic rocks of the Kenai Mountains and the low-lying Tertiary sediments of the northwestern part of the Kenai Peninsula. The Border Ranges fault is believed to traverse the bay, though the fault's exact location is not known. In the summer of 1981, a marine magnetic survey was carried out to locate the fault and/or other geologic boundaries. The magnetic data indicate that a fault, presumed to be the Border Ranges fault, traverses the bay between the Seldovia and Homer areas. The location of what is inferred to be the contact between the Mesozoic and Tertiary rocks can also be seen in the magnetic data. The data also suggest the existence of an ultramafic body beneath the bay.

RAFFALDI, FRANK, Shell Oil Co., Houston, TX, and DAVID LOVENVIRTH, Exploration Logging, Sacramento, CA

Satellite Transmission of Geologic Data from the Ocean Odyssey

Current satellite communications technology makes it possible and practical to transmit geological and other information from remote oil rigs, under adverse environmental conditions. Under such critical conditions, the ability to provide experts, who are at a significant distance from the rig, with the information necessary to understand what is happening and to carry out timely interpretations has an important impact on successful exploration and economic objectives.

The Ocean Odyssey, operated by Shell in Alaskan waters, provides a practical example of the benefits of satellite communications. From locations in the Bering Sea, Shell is transmitting information to its offices in both Anchorage and Houston for review and analysis. Digital information, suitable for detailed processing and analysis by a mainframe computer is also transmitted. Transmissions designed for managerial and specialist review include periodic reports and tabular printouts, as well as selective color plots of key parameters. The latter are being sent at key points in the drilling process and in response to specific office-based requests for information. Examples of useful transmission formats are provided.

A close relationship exists between the status of well-site operations and the manner in which data communications are carried out. Operational schedules are normally keyed to the work schedule on the rig. But as office-based users become accustomed to examining timely information, additional transmissions are requested. With the present satellite communications configuration the operational schedule is also constrained by the availability of the satellite link. Data communications are based upon batch transmission in which digital information, prints, plots, and reports are accumulated according to the operational schedule and then transmitted, via the Inmarsat satellite. Automatic error correction assures that the information arriving at each office is reliable. Automatic data-encryption assures that the information is properly secured against unauthorized access.

Extensive planning is necessary to allow for special problems that arise in establishing a satellite communications link from offshore rigs. These range from technical considerations in providing effective satellite coverage over a wide geographical area in which the offshore rigs may range, to equipment placement and operation, to the development of effective training programs for personnel on the rig and in the office. The elements of the plan are discussed, and examples drawn from the Ocean Odyssey are reviewed. Estimates of actual communication-time requirements are provided along with some of the cost and benefit considerations.

RAO, P. D., J. S. YOUTCHEFF, and J. E. SMITH, Univ. Alaska, Fairbanks, AK

Chemical and Petrographic Characterization of Drill Core from Beluga Coalfield.

Chuitna River field is part of the Beluga-Yentna field in the upper Cook Inlet basin. Coal occurs in the Tertiary rocks of entirely continental origin. In order to characterize the vertical variation of coal more completely and to understand the environments of coal deposition, a drill hole was cored to a depth of 290 ft with the help of Diamond Alaska Coal Co. The core included five coal beds: Blue (bottom 15 ft), Red 3 (13 ft), Red 2 (26 ft), Red 1 (16 ft), and Purple (5 ft). These beds were sampled foot by foot and were characterized for ash, moisture, ash fusibility, ash composition for major oxides and trace elements, vitrinite reflectance, and petrographic composition under normal incident light as well as fluorescent illumination. A palynological evaluation is in progress. Ultimate analyses were made for 5-ft intervals.

Ash composition of foot-by-foot samples varied widely. For example SiO_2 ranged from 0.58 to 65%, Fe_2O_3 from 1.97 to 57%, CaO from 2.5 to 35%, P_2O_5 from 0.07 to 17%, and Ba from 0.19 to 3.7%. Petrologic analyses showed less drastic variations within a seam. The wide variation in ash composition, particularly of iron and silica, among others, is indicative of periodic changes in pH of the swamp environment. Lack of high inertinite zones within the seams studied shows that the swamp was not subjected to drastic changes in the water table and that the subsidence kept pace with peat accumulation during the formation of each of the seams.

RATTEY, R. P., BP Explor. Inc., San Francisco, CA

Northeastern Brooks Range, Alaska: New Evidence for Complex Thin-Skinned Thrusting

Extensive fieldwork has shed new light on the style of deformation in the Franklin, Romanzof, and British Mountains of the northeastern Brooks Range. Bedding-parallel thrusting controls the structure, and two