commonly occur at basement, at shale-limestone interfaces, at faults, etc. Provided that the geometry of the structure is simple enough and that adequate conductivity contrasts exist, measurements can be interpreted in terms of structure. Hence, one can outline basement depth in a sedimentary basin, measure depth to weathering, or delineate a fault by telluric current methods.

The measurements can be made in a number of different ways, among which are the telluric, magnetotelluric, and wave-tilt techniques. Several of these are being actively studied by various research groups. Instrumentation depends on the depth of investigation desired, as well as on the technique used, but seems to present no fundamental problems for exploration applications.

The major problems at the present time are analyzing and interpreting the measurements. Anlaysis (filtering) is now being done in a routine fashion by digital computers, but could be done electronically. Interpretation techniques at present allow at least semiquantitative depth estimates ($\pm 10\%$) and can possibly be refined to enable greater accuracy.

Results of our magneto-telluric measurements in areas of well-known geology show that reasonable information can be obtained by rather brute-force interpretation techniques.

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BASEMENT CONTROL IN THE STRUCTURAL EVOLUTION OF SOUTHERN OKLAHOMA

Southern Oklahoma comprises a complex of structural elements that can be related to recurrent movement on a system of basement faults that had its origin at the time of consolidation of the crystalline basement. Repeated trans-current movements, accompanied by uplift of horsts and deep subsidence of adjacent grabens delineated by this major fault system, have exerted a profound control over the stratigraphic and structural evolution of southern Oklahoma.

The larger faults, the Meers fault of the Wichita Mountains, the Washita Valley and Sulphur faults of the Arbuckle Mountains, and the Choctaw fault of the Ouachita Mountains dominate the minor faults and delineate the major basement blocks, namely, the Wichita block, the Tishomingo-Belton uplift, and the frontal edge of the Ouachita Mountains and the intervening basins. The interplay of these basement controlled blocks and their adjacent grabens has not only influenced sedimentation by establishing the pattern of basin development but they controlled the magnitude and type of tectonism that has occurred throughout the Paleozoic Era.

Transcurrent movement, according to the wrench-fault mechanics of Moody and Hill, on the major faults which border the basement blocks has produced the stress field responsible for the structural complexity produced during the several stages of the orogenic climax in late Paleozoic time.

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OXYGEN ISOTOPE RATIOS IN FRESH-WATER LIMESTONES AS SENSITIVE PALEOCLIMATIC TEMPERATURE INDICATORS

Oxygen-18/Oxygen-16 ratios of marine limestones and calcareous organisms have been widely applied to the determination of water temperatures of ancient oceans after the technique was developed by Urey et al. The use of the carbonate paleogeothermometer has not been extended much past the Cretaceous because of uncertainties in the oxygen isotopic composition of pre-Cretaceous seawater and because of the possibility of isotopic exchange between marine carbonates and isotopically lighter intrastratal fluids.

Freshwater limestones and fossils have not been used for paleotemperature determinations because of the great variation in the O^{18}/O^{16} ratio of the water in which these carbonates were precipitated. Such variations arise from differences in latitutde and altitude at which meteoric precipitation of water took place, the origin and history of the air mass, and the extent of evaporation of stream and lake water. Duplicate isotopic analyses of 157 proven fresh-water limestones of Devonian to Quaternary age which were formed in large bodies of water, excluding saline lakes, and which show no signs of isotopic alteration, suggest that the variation is random and that a large number of samples may provide a mean δO^{18} value which is temperature dependent. Mean δO^{18} values are: Devonian (-8.57), Pennsylvanian (-5.25), Permian (-4.36), Triassic (-5.12), Jurassic (-8.52), Cretaceous (-10.22), Tertiary (-9.65), Quaternary (-8.15), in permil, relative to the Chicago PDB standard. The results form a regular sinusoidal curve with O^{18}/O^{16} maxima in the colder periods of Permo-Caboniferous and Quaternary glaciation, and a minimum for the Cretaceous. Large bodies of fresh water, because of a greater response to worldwide temperature fluctuations than the oceans, form limestones whose isotopic composition may yield significant paleoclimatic information in the form of relative climatic temperatures.

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COMPOSITION AND STRUCTURE OF THE KEEWATIN VOLCANIC ROCKS

Approximately three hundred Keewatin volcanic rocks have been analyzed from nine greenstone areas in the southern part of the Superior province. Basalt-andesite-dacite-rhyolite series are typical of each area and indicate a continental orogenic origin. The non-spilitic composition of the lavas confirms the continental orogenic origin rather than volcanism during accumulation of geosynclinal material.

A regional study of the volcanic areas shows that each area is merely a part of a great volcanic province instead of a series of subparallel volcanic belts. The present state of the volcanic formations is related to the depth of the granitic crust, to the intrusion of granite diapirs, and to major slip folding involving the volcanic series.

The continent was present before the Keewatin volcanism. The earliest known rocks of the Shield consist of a series of sedimentary rocks, possibly 20 km. thick, from which the Kenoran granites were derived by crustal melting.

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CONODONT DISTRIBUTION IN A MIDDLE ORDOVICIAN LIMESTONE

A 59-foot section of the upper Cobourg formation (upper Middle Ordovician) at Colborne, Ontario, was sampled at 2-foot intervals without regard to bedding. The limestone is thin-bedded biomicrite and biosparite,