diatom assemblages. Pleistocene assemblages are dominantly non-marine.

Extensive areas of Miocene, Pliocene, and Pleistocene sediments in Nevada also contain distinctive non-marine diatom assemblages. In that region, diatoms, more commonly than otherwise, are the only fossils present. Here also the diatoms can provide much needed paleoecological information, as the Cenozoic lake basins varied greatly in depth, temperature, salinity, pH, and other factors of paleoecological importance.

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GEOLOGIC HISTORY OF PACIFIC BASIN

The oldest fossils in the Pacific Basin are only of Middle Cretaceous age. They consist of coral reefs on the tops of extinct volcanoes which have more than 2 miles of local relief. Consequently, the basin must have existed long enough for the accumulation of an ocean more than 2 miles deep prior to Cretaceous time. In all probability the basin is of the greatest antiquity.

Fossils occur on enough atolls and guyots to permit the construction of a geological history of the Pacific during the last 100 million years. Vulcanism was widespread and volcanic islands were relatively common during early Tertiary time. Shortly after they reached full development, the volcanoes began to subside and an area of several million square miles in the central western Pacific apparently sank as a unit.

Tectonic events of the first magnitude have occurred in the eastern and southern Pacific but their geologic history is little known. Present seismicity and high heat flow suggest that the events may be continuing at present. Vertical displacements of 1 to 2 miles, and horizontal displacements of 200 to 400 miles have torn the sea floor into distinct blocks.

Unconsolidated sediment has filled the basin to a depth of only about 1,000 feet. Most of the sediment has been deposited very slowly by the accumulation of pelagic organic remains and continental dust. In a few places, notably off the United States, Canada, New Zealand, and Japan, turbidity currents are separated from the open basin by sediment traps in the form of island arcs and trenches.

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PRECAMBRIAN BASEMENT ROCK TYPES IN MID-CONTINENT REGION

Recent compilation of data by the Kansas Geological Society's Basement Rocks Committee regarding the Precambrian in part of the Mid-Continent provides a framework in which to analyze further this rock complex. In Kansas alone, more than 2,100 wells are known to have penetrated the Precambrian, and approximately 50–60 tests a year are drilled into the basement. Studies are now in progress to attempt to determine detailed spatial relationships of these rocks and their intricate geologic history.

By using only preliminary information, it is possible to differentiate general categories of rock types at the Precambrian surface, which in Kansas is buried beneath Paleozoic rocks at depths from 500 to 9,000 feet. Rocdk types recognized include granite, granodiorite, syenite, diabase, rhyolite, and metasediments; the interrelations of these are exceedingly complex.

Sediments, chiefly alternating silicate-cemented sandstone and indurated shale, have been described from Missouri and may be abundant elsewhere. Outliers of schist capped by resistant quartzite form buried hills in central Kansas.

Diabase and related types of mafic rocks are found; syenite may be in the form of intrusive plugs. Extrusive rocks are represented by the rhyolite and associated suites. Granite of various kinds is by far the most extensively recorded rock type in the Mid-Continent; granodiorite has very limited distribution. In many areas, the deeply weathered and perhaps even reworked pre-Reagan (or Lamotte) basement rock constitutes "granite wash" assumed here to be Precambrian.

Geographic distribution of different rock types is suggestive of pre-Paleozoic structure. A wide band of metasediments through central Missouri, northeastern Kansas, northeastern Nebraska, and southeastern South Dakota forms a large arc convex southwest perhaps outlining the southwestern flank of the old Wisconsin Highlands. Present dip of the metasediments in west-central Missouri is known to be southwestward. Outside the belt of metasediments are igneous rocks and some metasediment outliers.

Potassium-argon ages determined by J. L. Kulp on five samples from Barton, Rush, and Morris Counties, Kansas, yielded dates of 1,165 to 1,460 million years, comparable with ages elsewhere in the central United States.

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DISTRIBUTION OF LATE CRETACEOUS AND EARLY TERTIARY NON-MARINE STRATA IN WEST-CENTRAL ALBERTA

Investigation of Late Cretaceous and Tertiary non-marine strata of west-central Alberta has been undertaken for the Research Council of Alberta to solve problems of origin, correlation and age, structure, and nomenclature. Sediments are exposed in or underlie a belt extending from the Foothills northeast to the line Drumheller-Edmonton-Whitecourt and from Calgary-Drumheller northwest to the Athabasca River. Units of immediate concern include Edmonton, Brazeau, Paskapoo, and Saunders. Abundant well records afford an opportunity for correlation between northeastern and southwestern outcrop belts, as well as to study regional and local sedimentary patterns.

Purpose of this paper is to present the results of preliminary subsurface studies of regional relationships among the non-marine strata that are exposed in various areas. On the northeast, formations include the Belly River, Bearpaw (marine), Edmonton (all Cretaceous) and lower Paskapoo (Tertiary). The part of the section commonly recognized as Cretaceous is approximately 2,600 feet thick. Except for the marine Bearpaw, the units are almost entirely non-marine, composed of lenticular shales, siltstones, sandstones, and coal beds. Similar rocks, assigned to the Paskapoo, overlie the Edmonton.

In the subsurface, near Lacombe and not far west of Edmonton, the Bearpaw passes into terrestrial beds, so that non-marine units are not so easily separated. Southwestward, the entire sequence becomes coarser (sandstones more abundant, and coarser-grained), and thickens markedly on the order of 20 feet per mile, across the strike and toward the Foothills. Equivalent units in and near the Foothills include those called the Brazeau, Saunders, and Paskapoo, but published correlations are open to question.