upper Darby, the Costigan member of the Palliser, and equivalent clastic and non-clastic beds between the top of the anhydrite and the base of the Exshaw shale in the subsurface.

An attempt is made to refine correlations by tracing of cyclical evaporite deposits, widespread clastic zones, and biostromal and fossiliferous-fragmental limestones.

18. FORAMINIFERA OF PARTS OF CRETACEOUS IN ROCKY MOUNTAIN AREA. By A. J. CROWLEY, The Texas Company, Denver, Colorado.

The Cretaceous shales in the Rocky Mountain area contain a well developed and distinctive microfauna. It is possible to make wide regional correlations both on outcrops and in the subsurface by use of it.

Little attention has been paid to this fauna in the past; in fact, its very existence seems to have been unknown to many.

The Lower Cretaceous forms are largely siliceous and arenaceous, while the Upper Cretaceous forms are largely calcareous. This paper deals with a generic description of the faunas of the various subdivisions of the Cretaceous, together with suggested regional correlations of some of the Rocky Mountain nomenclature.

19. MADISON GROUP (MISSISSIPPIAN) OF BIG HORN AND WIND RIVER BASINS, WYOMING. By M. E. DENSON, JR., California Institute of Technology, Pasadena, California, and NORMAN S. MORRISEY, Stanolind Oil and Gas Company, Tulsa, Oklahoma.

Studies of both surface and subsurface sections of the Madison group in the Big Horn and Wind River basins, Wyoming, indicate that persistent units can be recognized by means of field data and insoluble residue analysis. From top to base the major units are: (1) beds of unknown age herein termed "Upper Madison," (2) the Mission Canyon formation and (3) the Lodgepole formation.

"Upper Madison" strata occur sporadically over the area; previous work indicates that these beds may be of late Mississippian age. The Mission Canyon formation is subdivided into an upper and a lower member; this formation is relatively uniform in thickness. Regional variations in thickness of the Madison group are confined for the most part to the Lodgepole formation. This formation thins to the south and east and probably is not present in the southern Wind River Basin.

20. PALEOZOIC STRATIGRAPHY OF GREAT BASIN. By W. L. STOKES, Department of Geology, University of Utah, Salt Lake City, Utah.

The present Great Basin embraces deposits of an inner (eastern) geosyncline and an outer (western) geosyncline. Disregarding the problem of naming and classifying these two features, attention will be focused on the better known eastern trough where an intensive search for oil is currently in progress. Outstanding features of the sedimentary section are: (1) preponderance of marine chemical rocks, (2) great thickness of certain units, and (3) evidences for mid-Paleozoic orogeny.

Base of the sedimentary section almost everywhere is a thick quartzite (Prospect Mountain-Brigham) which transgresses through time from late pre-Cambrian to late Cambrian. Above this is an accumulation of Cambrian carbonate rocks reaching a thickness of 10,000 feet in the central part of the trough. The Cambrian passes into Ordovician with little evidence of hiatus, and carbonate sediments (Pogonip-Garden City) continued to accumulate giving a complete record of the period up to about Chazy time. A useful key bed and one of the few clastic units, the Eureka-Swan Peak, was then laid down. Late in the Ordovician a second, thinner dolomite unit (Fish Haven-Hansen Creek) came into being.

The Silurian system is represented by a rather uniform, scantily fossiliferous dolomite formation (Laketown-Lone Mountain-Roberts Mountain) which accumulated during the Niagaran epoch. Thickness averages between 500 and 1,000 feet.

All epochs of Devonian time are represented, but Middle Devonian rocks are the most extensive. Key locality for the system is the Roberts Mountains region of Nevada where about 4,500 feet of Devonian rocks are present. Dolomite appears to be the dominant rock of the thinner sections. Much in the way of correlation of Devonian units in western Utah remains to be done.

The Mississippian is lithologically the most varied of the Paleozoic systems. Sediments reflect orogeny in west-central Nevada and range from conglomerates and redbeds on the west through quartzites, sandstones and black shales to limestones on the east. Maximum thicknesses are on the order of 5,000 feet. Numerous named and unnamed units remain to be more thoroughly studied. Continuous sedimentation from Mississippian into Pennsylvanian is indicated.

The most characteristic and striking Pennsylvanian unit is the fusulinid-bearing Oquirrh formation which shows crude cyclic deposition, involving a variety of chemical and clastic rocks. This unit may reach a thickness of 20,000 feet in the east-central Great Basin, but there is a decrease in thickness and loss of certain intervals westward. Again sedimentation disregarded systemic lines and Permian Wolfcamp fusulinids are found in the upper part of the Oquirrh.

Following the Oquirrh is a variety of thinner Permian units such as the Phosphoria, Supai, Kaibab, and unnamed formations in Nevada. Redbeds, gypsum, phosphate rock and massive chert are rather unusual constituents of this interval.

21. REEFING LIMESTONES OF HERMOSA FORMATION, SAN JUAN CANYON, UTAH. By SHERMAN A. WENGERD, Department of Geology, University of New Mexico, Albuquerque, New Mexico.

The Hermosa formation of Pennsylvanian age, exposed in the San Juan Canyon where it transects