Frequent and rapid display of data by computer maps and tabulations can provide continuous access to every part of the data file during the life of the project. The variety of computer output can pinpoint areas in need of greater effort. Judicious use of a computer program library can provide a geologist access to most of the standard treatments. Their use may provide him with answers, but can also suggest new approaches. In many cases he may consider output from a computer model as an "unbias view" of his data.

Mathematical analyses, engineering techniques, and economic evaluations used variously by geologists become standard tools on the computer. Although their use requires his appreciation of their capabilities, and their results demand an awareness of their exploration implications, their intricacies of solution no longer concern him. Their repeated use with multiple sets of data can communicate relationships not previously known.

JAMES A. MOMPER, Pan American Petroleum Corp., Tulsa, Oklahoma

PERMIAN SYSTEM OF SOUTHERN ROCKY MOUNTAINS AND SURROUNDING PROVINCES

The Permian Period lasted approximately 50 m.y., beginning 275 m.y. ago. The sedimentary rocks of this system have been divided into four series in the western United States. Despite the scarcity of datable fossils, series correlations generally are reliable except in the piedmont and intermontane redbed facies.

The basal Wolfcamp Series is more extensive and thicker, on the average, than any of the other series. The Ochoa Series, the youngest, essentially is confined to the Permian basin, the Anadarko-Hugoton area and the Great Basin. The Guadalupe Series extends well beyond the erosional limits of the underlying Leonard Series in the northern Great Plains but is absent on much of the Colorado Plateau where the Leonard is well preserved.

A regional unconformity, usually of low angle, separates Permian rocks from the Pennsylvanian System, even where the Virgil Series of Late Pennsylvanian age underlies the Wolfcamp. It is believed that late Virgilian-early Wolfcampian time is not represented in most of the region. The Triassic System also is separated from the Permian by a regional low-angle unconformity. Rocks of Early Triassic age are missing by nondeposition or erosion in part or all of the southern structural provinces where the Ochoa is present.

Detailed studies also indicate the presence of interseries unconformities of regional extent. Lower Leonard, lower Guadalupe, and lower Ochoa rocks have limited areal distribution.

Permian depositional environments ranged from terrestrial-piedmont to deep-marine-basinal. Shelf-marine carbonates generally decrease in importance upward through the system whereas evaporite deposits, including halite, are more common and more widespread.

Permian rocks are the source of considerable mineral wealth including, in addition to petroleum, potash, phosphate, sulfur, and helium. Carbonate and sandstone reservoir rocks of Guadalupian, Leonardian, and Wolfcampian ages have yielded vast quantities of oil and gas, especially in the central Rockies, Great Plains, and Permian basin. Permian source shales in western Wyoming and in the Permian basin were major oil contributors.

ALLISON R. PALMER, State University New York, Long Island, New York

CAMBRIAN HISTORY OF WESTERN UNITED STATES

The Cambrian deposits of the western United States represent three major coexisting lithofacies, arranged more or less parallel with the western margin of the continental interior. The inner lithofacies is composed largely of terrigenous materials derived from the continental interior. The middle lithofacies consists largely of clean carbonate sediments of many kinds that represent relatively shallow, commonly high-energy deposits interpreted to be the products of a great series of coalescing banks. Seaward from the carbonate belt is an outer lithofacies represented by generally dark-colored, apparently deeper water sediments containing a moderate to high proportion of siliceous materials, some of apparent terrigenous origin. Region-wide expansion and contraction of the clean carbonate environment, and overall temporal transgression of all environments toward the continental axis, have produced the complex of formations and formational sequences presently observed in the western United States.

J. R. PATTERSON, Amerada Petroleum Corporation, Calgary, Alberta

REGIONAL ORDOVICIAN STRATIGRAPHY OF ROCKY MOUNTAIN REGION

The Ordovician formations of the Rocky Mountain region exhibit a remarkable unity in their stratigraphic development. A formational terminology in one area serves equally well in other areas, so that the most thoroughly documented stratigraphic relationships, such as those of the Bighorn and Winnipeg Formations, can be adopted as standards for the entire Rocky Mountain province. In explanation of this procedure, regional lithological similarities within formations and lithological contrasts between each formation are illustrated to show their relation to superpositionally significant unconformities. Existing zone and stage designations not based on adequate stratigraphic integration conflict with this scheme. The Bighorn cannot be entirely Richmondian, nor can the Winnipeg be Trentonian to Chazyan if the superpositional aspect of stratigraphy is admitted as evidence for their derivation.

GEORGE N. PIPIRINGOS, U. S. Geol. Survey, Denver, Colorado

JURASSIC AND TRIASSIC OF WYOMING AND SOUTHERN ROCKIES

Correlations of continental Triassic and marine Jurassic rocks in Wyoming, northwestern Colorado, and northeastern Utah are based on 150 measured sections. In central Wyoming, these rocks are about 1,000 ft thick and consist, from bottom to top, of the following formations: Crow Mountain and Popo Agie (Triassic), Nugget (Triassic? and Jurassic?), and Gypsum Spring and Sundance (Jurassic). The lower part of the Nugget has been named. South and east of the Wind River basin, rocks equivalent to the Crow Mountain are called the Jelm Formation. In northwestern Colorado and northeastern Utah, Jurassic and Triassic rocks discussed here are about 1,500 ft thick and consist, from bottom to top, of the following formations: Chinle (Triassic), Glen Canyon (Triassic and Jurassic), and Carmel and Curtis (Jurassic). These formations thin southeast toward central Colorado. Near Boulder they are represented by