subsidence in the foreland basin, (5) the disjunct history of subsidence and subsequent uplift of the Colorado-Wyoming-Utah (CWU) region beyond the foreland basin, and (6) the initial stability and subsequent subsidence of the High Plains region.

During normal subduction, thin-skinned crustal deformation was continuous opposite the convergent margin. During the ensuing period of low-angle subduction, the Colorado Plateau region was underpinned by subducted lithosphere, anomalous subsidence occurred in the CWU locus, and deformation was transferred to the position of greatest contrast in mechanical properties of the crust (the eastern and northern boundaries of the plateau). Decoupling of subducted lithosphere from overlying lithosphere caused uplift and erosional stripping of the CWU region, crustal flexure to the east, and sediment accumulation on the High Plains.

DECKER, DAVID, Resource Enterprises, Inc., Grand Junction, CO

Appropriate Stratigraphic Nomenclature for Coal Reservoirs in Piceance Basin, Colorado

Coal-bearing intervals occurring within the Upper Cretaceous Mesaverde Group in the Piceance basin have been described by various authors. The most current and widely accepted work has the Sego, Corcoran, Cozzette, and Rollins Sandstone Members comprising the Iles Formation. The overlying Williams Fork Formation is divided into the basal Bowie Shale Member and Paonia Shale Member, with the upper remaining section undifferentiated.

Coal seams associated with the Iles Formation belong to the Black Diamond coal group. The Fairfield coal group and the South Canon coal group are part of the Bowie Shale Member. These two coal groups, continuous throughout the basin, are also called the Sommerset coals in the Sommerset coal field and the Cameo coal measures in the Grand Mesa coal field. Although priority of nomenclature dictates otherwise, established usage of the "Cameo coals" for coal seams in the Bowie Shale Member should be continued as the most appropriate nomenclature.

The basal coal seam of the proposed Cameo coal group is laterally continuous throughout the Piceance basin. A second coal seam 40-120 ft (12-37 m) above the basal coal also has large areal extent. Both coal seams, as existing and potential future pay zones, are of significant economic importance and should, in ascending order, be classified as the Cameo coal A and D seams.

The coal seams in the Paonia Shale Member, extremely variable in thickness, continuity, and quality, have been established as the Coal Ridge coal group.

DEJARNETT, JEFF, Champlin Petroleum Co., Englewood, CO

Paleogeographic and Sedimentologic Significance of Mississippian Sequence at Mt. Darby, Wyoming

Mississippian strata at Mt. Darby comprise the Madison Group and the overlying Humbug Formation. This sequence, although initially transgressive, exhibits an overall regressive character produced by progradation of platform carbonates in response to sea level fluctuations related to Antler orogenic events.

The Paine Member of the Lodgepole Limestone, the basal formation of the Madison Group, consists of relatively deep-water carbonates including a possible Waulsortian-type carbonate bank that accumulated on a Kinderhookian foreslope. At least five shoaling-upward grainstone cycles are recognizable in the Woodhurst Member of the Lodgepole Limestone. These cycles record Osagean deposition in shallow agitated environments that developed high on a clinoform ramp. Shelf-margin and platform carbonates dominate the Mission Canyon Limestone, the upper formation of the Madison Group. This unit consists of two asymmetric depositional cycles, each with a thick regressive phase, capped by an evaporite solution breccia and an overlying thin transgressive phase.

The Humbug Formation, a sequence of fine-grained carbonates and sandstones, represents part of a deltaic complex that developed offshore from the Meramecian karst plain. Humbug sediments were transported northward to the Mt. Darby area from the area of the present Uinta Mountains, or another deltaic system formed there. Deposition in the study area was apparently continuous upward from the Madison carbonates into the Humbug. The middle Meramecian shoreline trended northwest between the present locations of Mt. Darby and Haystack Peak.

DESMOND, ROBERT J., Maze Exploration, Inc., Englewood, CO, JAMES R. STEIDTMANN, Univ. Wyoming, Laramie, WY, and DONALD F. CARDINAL, Consultant, Casper, WY

Stratigraphy and Depositional Environments of Middle Member of Minnelusa Formation, Central Powder River Basin, Wyoming

Regional correlations, from the southern to northern Black Hills and across the central Powder River basin to the Bighorn Mountains, serve as the frame work for a depositional model of middle Minnelusa sediments. In the eastern part of the study area, deposition took place in a carbonate sabkha environment. During transgressive periods, most of this region was covered by a restricted shallow sea. In the northern Black Hills, close to the limit of the transgression, deposition occurred in a coastal dune setting. During regressions, the sabkha prograded westward toward the Lusk embayment. Coastal dune fields to the north and isolated dune complexes to the south migrated southwestward across this prograding sabkha. West of the Lusk embayment, deposition occurred in a sand-dominated tidal-flat environment during transgressions and along the coastal edge of an eolian sand sea during regression.

DICKINSON, WARREN W., and B. E. LAW, U.S. Geol. Survey, Denver, CO

Burial History of Upper Cretaceous and Tertiary Rocks Interpreted from Vitrinite Reflectance, Northern Green River Basin, Wyoming

The burial history of Upper Cretaceous and Tertiary rocks in the northern Green River basin is difficult to reconstruct for three reasons: (1) most of these rocks do not crop out, (2) there are few stratigraphic markers in the subsurface, and (3) regional uplift beginning during the Pliocene caused erosion that removed most upper Tertiary rocks. To understand better the burial and thermal history of the basin, published vitrinite reflectance (R_0) data from three wells were compared to TTI (time-temperature index) maturation units calculated from Lopatin reconstructions. For each well, burial reconstructions were made as follows. Maximum depth of burial was first estimated by stratigraphic and structural evidence and by extrapolation to a paleosurface intercept of $R_0 = 0.2\%$. This burial was completed by early Oligocene (35 Ma), after which there was no net deposition. The present geothermal gradient in each well was used because there is no geologic evidence for elevated paleotemperature gradients.

Using these reconstructions, calculated TTI units agreed with measured R_0 values when minor adjustments were made to the estimated burial depths. Reconstructed maximum burials were deeper than present by 2,500-3,000 ft (762-914 m) in the Pacific Creek area, by 4,000-4,500 ft (1,219-1,372 m) in the Pinedale area, and by 0-1,000 ft (0-305 m) in the Merna area. However, at Pinedale, geologic evidence can only account for about 3,000 ft (914 m) of additional burial. This discrepancy is explained by isoreflectance lines, which parallel the Pinedale anticline and indicate that approximately 2,000 ft (610 m) of structural relief occurred after maximum burial. In other parts of the basin, isoreflectance lines also reveal significant structural deformation after maximum burial during early Oligocene to early Pliocene time.

DIMITRAKOPOULOS, R., W. GRIFFIN,* and G. D. WILLIAMS, Univ. Alberta, Edmonton, Alberta, Canada

Conditional Simulation: Geostatistical Tool Applied to Athabasca Oil-Sands Deposit

Geostatistical modeling of reservoir variability in the Athabasca oil-sands deposit prior to either surface or in-situ mining can provide valuable information to guide the extraction process. Geologic and engineering characteristics (variables), such as elevations of bitumen-saturated and waste (barren) zones, and percentage bitumen saturation, porosity, and permeability, have a controlling effect on recovery methods.

Each geologic variable is considered to be a particular realization of a random function defined within a geologic domain. This function can be inferred from available data (boreholes) under the hypothesis of stationarity. Other realizations (models) of the same random function can then be generated using the technique of conditional simulation, which is