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MEEK AND HAYDEN'S NONMARINE PALEONTOLOGY OF THE UPPER MISSOURI RIVER SECTION

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The details of F.B. Meek and F.V. Hayden''s earliest studies of molluscan fossils and marine and nonmarine strata along the Missouri River are known to specialists and an eclectic few. In the latter part of the 19th and first half of the 20th centuries, their new species and stratigraphic nomenclature were used by geologists to map large tracts of the Western Interior plains and intermontane basins and interpret the age relations of the "Judith River" and "Fort Union" time without substantial revision until the advent of mammalian biochronology. As the years have passed, their work continues to serve as the foundation for ongoing Paleogene molluscan evolutionary and biostratigraphic studies. We now know that both stasis and rapid faunal turnover are present in the freshwater molluscan record. The terrestrial record, which was not as well known to Meek and Hayden, is less well sampled, but appears to have left a more biostratigraphically and paleobiogeographically complicated record. The early Paleocene begins with opportunistic unionid bivalve (Unionidae) species largely unadorned by the sculpture of the Cretaceous. Only a few freshwater gastropod species can be demonstrated to cross the K/T boundary into the Fort Union Formation (Group), including two taxa named by Meek and Hayden. Molluscan diversity appears to remain relatively low until the final regression of the Paleocene Cannonball Sea. The "classic Fort Union" molluscan fauna described by Meek and Hayden is largely confined to strata overlying the marine Cannonball Member of the Fort Union Formation, including the Tongue River (Bullion Creek) and lower part of the Sentinel Butte Members. This stratigraphic interval represents the late Paleocene North American Land Mammal Ages Tiffanian-3 (Ti3) and Ti4, about 59 to 56 Ma. Thus the "Fort Union molluscan fauna time" used to correlate strata in dozens of U.S. Geological Survey coal-mapping programs was in fact correlating a much more restricted biostratigraphic interval of the Paleocene based originally on fossils collected by Hayden from outcrops along the Missouri River.

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Paleontology and Geology of the Missouri River: Following the Footsteps of Lewis and Clark II
Boise Centre on the Grove: The Summit
8:00 AM-12:00 PM, Wednesday, May 5, 2004