

## A POSSIBLE PLIOCENE DEPOSIT IN THE BLACK HILLS

Morton Green<sup>1</sup> and J. P. Gries<sup>2</sup>

<sup>1</sup>Museum of Geology

<sup>2</sup>Department of Geology and Geological Engineering

South Dakota School of Mines and Technology

### ABSTRACT

A camelid astragalus referred to *Megatylopus* suggests that some of the gravels mantling the Mountain Meadow surface on the east side of the Black Hills just south of Rapid City may be Early Pliocene in age.

In the Spring of 1962 a bone found during gravel hauling operations was given to the junior author by Harold Pool of Rapid City, S. D. The specimen, SDSM No. 6210 is an astragalus of a large camelid. Although the bone may belong to *Alticamelus* it compares favorably with a series of *Megatylopus astragali* from an Upper Snake Creek quarry in Sioux County, Nebraska which is in the American Museum of Natural History collection.

The bone is similar in texture and appearance to material from the Mission fauna (late Lower Pliocene) described by Macdonald (1960). *Megatylopus* is not represented in the Mission local fauna, nor in the Wolf Creek local fauna (Green, 1956) but it is, however, present in the Big Spring Canyon fauna (Gregory, 1942). The latter is late Lower Pliocene in age. Greatest length 97.0 mm., greatest width 70.8 mm.

South of Rapid City, U.S. Highway 16 ascends the Cretaceous hogback, and follows along its crest for about three miles before dropping down into the drainage of Spring Creek. Along this interval, which extends from near the center of Sec. 14 to the center of Sec. 34, T. 1 N., R. 7 E., the hogback ridge is truncated by what is generally interpreted as a remnant of the Mountain Meadow erosion surface (Fillman, 1929). This surface undulates, and along the three mile interval, varies between 3800 and 3870 feet in elevation. One or more thin gravels mantle the truncated bedrock surface. Darton and Paige (1925) mapped the gravel as White River.

The most conspicuous gravel is red in color, and poorly sorted. It has been exposed by prospect pits, and limited quantities have been used by local ranchers for graveling private roads and farm-yards.

The bone in question came from one of two such pits, but it was not discovered until the gravel was spread. One pit is directly west of the Pool Ranch buildings, in the SE $\frac{1}{4}$  SE $\frac{1}{4}$  Sec. 27,

the other, which has been destroyed by a highway relocation project, was in the SW  $\frac{1}{4}$  NW  $\frac{1}{4}$  Sec. 26. Extensive exposures may now be seen in the borrow pit along newly rebuilt U. S. Highway 16.

The pit in Sec. 27 is typical. Here the deposit consists of several feet of poorly sorted gravel, ranging from silt to cobble size. The pebbles and cobbles are dominantly Precambrian quartzite and other siliceous rocks, with a few fragments of deeply weathered schist. Some pieces have been lime encrusted subsequent to deposition. A 20-minute search by six geologists failed to turn up a single piece of Paleozoic sedimentary rock. The matrix of fine sand and clay is dominantly red, and it appears to have been derived from the Permo-Triassic Redbeds which cropped out a few hundred yards to the west when the surface was formed. A few soft maroon pieces resemble weathered Minnelusa shales, but this seems unlikely in the absence of any pieces of Paleozoic limestone or sandstone.

The poorly sorted, shingled nature of the deposit suggests rapid deposition, possibly the eroding, transporting and redeposition, of a previously existing gravel deposit not far to the west.

The known geologic range of *Megatylopus* is Lower through Middle Pliocene. Its occurrence in the Big Spring Canyon fauna suggests that some of the gravels on the Mountain Meadow surface may be Lower Pliocene in age rather than Oligocene.

Although a preliminary investigation produced no other fossils, weathering of cuts along the borrow pit may produce additional material in the future.

### References

- Darton, N. H. and Paige, S., 1925. Geologic Atlas of the United States. Central Black Hills Folio, No. 219, U.S. Geol. Survey, Dept. of the Interior, Wash., D.C., 1-34, 43 figs., 3 pls., 6 maps.
- Fillman, Louise, 1929. Cenozoic History of the Northern Black Hills. Univ. Iowa Studies, Natural History. Vol. 13, No. 1, 1-50, 12 pls.
- Green, M., 1956. The Lower Pliocene Ogallala-Wolf Creek Vertebrate Fauna, South Dakota. Jour. Paleo., Vol. 30, 146-169, 12 figs.
- Gregory, J., 1942. Pliocene Vertebrates from Big Spring Canyon, South Dakota. Bull. Dept. Geol. Sci. Univ. Calif. Publ., Vol. 26, 307-446, 54 figs., 3 pls.
- Macdonald, J. R., 1960. An Early Pliocene Fauna from Mission, South Dakota. Jour. Paleo., Vol. 34, 961-982, 9 figs.

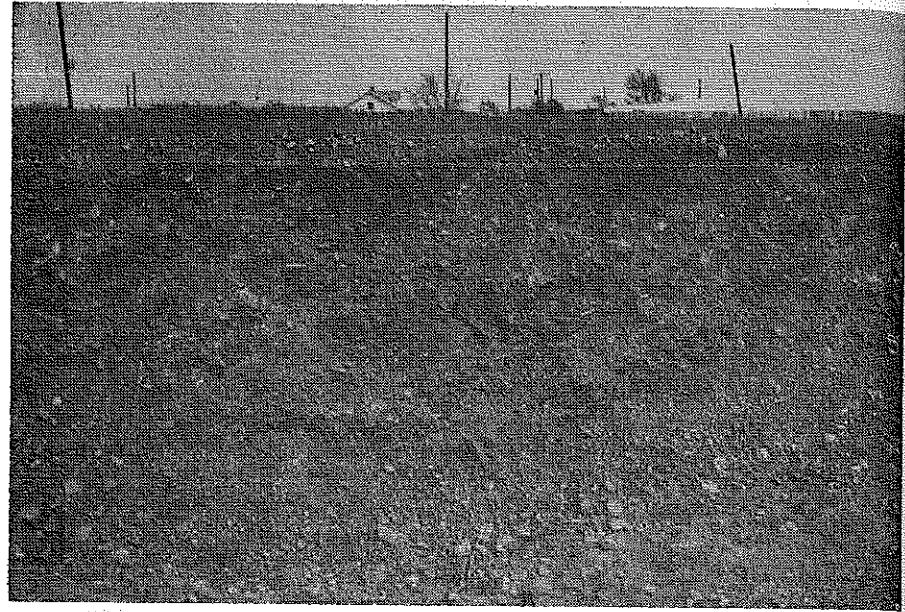


Fig. 1. View of gravel pit directly west of Pool Ranch buildings showing poorly sorted gravel. Photo by R. W. Wilson.