

A BRIEF DESCRIPTION OF THE GEOLOGY OF  
GOSHEN, PLATTE, AND LARAMIE COUNTIES, WYOMING

by S. H. Knight

Much of the surface areas of Goshen, Platte, and Laramie counties are overlain with an alternating succession of sands, shales, and clays of Tertiary Age. This succession has an aggregate thickness of from 400 to 500 feet and it rests for the most part (unconformably) upon the folded and eroded Cretaceous and older rocks. This succession is for the most part not in horizontal attitude, although locally it shows evidences of having been disturbed by Earth movements subsequent to its deposition. The northern portions of Goshen and Platte counties are characterized by the Hartville Uplift. Here the older rocks include formations of pre-Cambrian, Paleozoic, and Mesozoic in age. In the eastern portion of the Hartville Uplift the granites and associated rocks of the Basement Complex are exposed. In the Goshen Hole region the overlying Tertiary sediments have been completely removed by erosion and the underlying Cretaceous rocks are exposed over a considerable area in the bottom of this depression. The Tertiary succession consists of the Chadron, Brule, Harrison, (Arikaree) and Ogallala. The Chadron Formation is exposed only along the eastern flank of the Laramie Range. It consists of alternating sandstones and conglomerates and has a varying thickness up to a maximum of one hundred or more feet. Directly overlying the Chadron Formation is the Brule Formation. This formation has a thickness of approximately two hundred feet and is composed for the most part of light colored clay, much of which was originally volcano ash. This formation is conspicuously exposed in the westward facing escarpment which lies from one to two miles east of the flank of the Laramie mountains. It is also conspicuously exposed in the rims of Goshen Hole. The Harrison Formation overlies the Brule clays. It is

composed of an intermingled succession of conglomerates, coarse shales, and clays. This formation caps the table lands between the subsequent valley which parallels the eastern flank of the Laramie Range and the lower lands to the East. These Tertiary Formations are:

1. Alluvial deposits which were laid down by streams which headed in the Laramie mountains and drained eastward across the Great Plains during Oligocene and Miocene times, and
2. Volcanic ash falls which were deposited from volcanoes that were active throughout the mountain region to the southwest and possibly the northwest during the time of the deposition.

The valleys of the present stream courses, notably the North Platte River Valley, are aggrading their courses at the present time. The depth of the alluvial fill of the North Platte River Valley in the vicinity of Guernsey is believed to exceed 150 feet. This is a conspicuous feature of some of the minor streams such as the Lodgepole and Crow Creeks.