

of the insulated basins in Nebraska. It is in the *Mauvaises Terres*, or Bad Lands, on White River. There is a basin 300 feet below the general level, in which there are thousands of abrupt, irregular, prismatic, and columnar masses, frequently capped with irregular pyramids, and stretching up to a height of from 100 to 200 feet, or more. So thickly are these natural towers studded over the surface of this extraordinary region, that the traveler threads his way through deep, confined, labyrinthine passages, not unlike the narrow, irregular streets and lanes of some quaint old town of the European continent.

But the most interesting facts there brought to light are the bones of numerous extinct quadrupeds, some of them of enormous size, and differing from all fossil animals hitherto described, though of the same families. Species of rhinoceros and tiger, large tortoises, a palæotherium eighteen feet long and nine feet high, the archæotherium, the oreodon, machairodus, etc., are described by Dr. Leidy; and doubtless many more will soon be brought to light from this singular fresh-water deposit, where some of the same genera of animals occur as in the Paris basin.

*Miocene*.—The other Miocene deposits of the continent, as at present known, are confined to the two oceanic tertiary belts—upon the Atlantic and Pacific coasts. The strata consist largely of sandstones, conglomerates, and shales, with scarcely any limestone.

Too little is known respecting the immense area of tertiary deposits in the Rocky Mountain district to pronounce with certainty their age. The presumption is in favor of the older tertiary.

*Pliocene*.—The Pliocene strata have not yet been much studied in this country, except at certain localities. In distribution they correspond to the Miocene; viz., along the coasts.

But there are, along the Appalachian chain, occasional beds of clay and iron ores with which no fossils are associated. In 1852, however, the senior author of this book explored a bed of lignite associated with these beds of iron, in Brandon, Vermont, and found in them a large number of fruits (figured in Part II.) which are evidently of the age of the Pliocene. From these data we have supposed all the deposits in similar positions throughout the range to belong to the Pliocene, although no lignite has been discovered in connection with them.

*Alluvium*.—The drift and alluvial deposits of North America have been so largely treated in Section IV. of Part I., that we simply refer to them in this connection, with no additional remarks.

#### IGNEOUS ROCKS.

That part of the map which is covered with small dots represents the distribution of the more recent igneous rocks, the traps and basalts. They are most abundantly developed along the Pacific coast. The largest area occupied by them is along the Columbia River in Oregon and Washington Territory. There are multitudes of smaller deposits along the Rocky Mountain ranges in Mexico and the Territories, which are not shown, three or four dotted areas standing as representatives of a large number. Farther north a similar series of trappean rocks is represented as a continuous belt. Igneous rocks are abundant, also, about the Arctic Ocean, especially in Greenland.

Trappean dykes are abundant along the Appalachian ranges and about Lake Superior; but they do not overflow the surface like those just described, and occupy too little space to be indicated upon the map. The granitic and the oldest igneous rocks are included under azoic rocks.

NOTE.—Captain J. H. Simpson, who in 1858 and '59 explored the *Great*