

chamber within. These high qualities of the "Calaveras" skull are part of the objection which has been brought forward to its being of Pliocene Tertiary age, and the Neolithic character of accompanying implements is another part.

Flint implements have been described by C. C. Abbott from stratified drift, along Delaware River, near Trenton, N.J. The deposits in which they occur are probably of Champlain age. At Loveland and Madisonville, Ohio, C. L. Metz found chipped implements in deposits of loess and stratified gravel. N. H. Winchell has reported the discovery of implements of polished stone and copper, with human bones, in terraced and stratified deposits near Minneapolis. In the loess of the Missouri valley, Neb., according to Aughey (1874), two chipped implements were found, associated with the vertebra of an Elephant. McGee reports his discovery of a chipped obsidian implement in the deposits about Lake Lahontan, Nev. Hartman's Cave, near Stroudsburg in Monroe County, Penn., has afforded T. D. Paret, and later H. C. Mercer, teeth of the Reindeer, a tooth of the American Bison, and remains of *Dicotyles Pennsylvanicus*, *Castoroides Ohioensis*, Horse, Lynx, Gray Fox, Wolf, Skunk, Beaver, Woodchuck, Muskrat, with a bone fish-hook, bone awls, harpoon, etc. There is apparently a mixture in the cave of Pleistocene and Recent. In Brazil, human remains were found many years since, by Lund, in caverns, along with extinct Quaternary Mammals; and Clausen has reported the occurrence of pottery in a bed of stalagmite containing these Mammals.

#### 4. RECENT PERIOD.

After the great alternations in level and in climate of the Early and Middle Quaternary, the earth appears to have reached, as the Recent period opened, one of its stages of relative quiet. The excavation of valleys, the distribution of earth and gravel over the rugged surface, and the filling of valleys with drift and alluvium had prepared the way for Man, the dominant species of the period. At the final stage in the preparation, the Brute Mammals had become diminished in size, and greatly also in number of species.

But the geological agents of change are still at work — the air, rivers, ocean, heat, chemical forces and interior causes of earth movements; and thereby rock-deposits are still in progress: metamorphism and vein-making by quiet methods; volcanoes with somewhat lessened activity; and upward and downward changes of level. Absolute equilibrium and rest will not be attained until the earth no longer contracts from cooling and waters cease to move and transport.

In the organic kingdoms, interactions among species, and conflicts with natural conditions, are producing variation in Recent time as hitherto, but with this prominent difference: that Man, on leaving the wilderness, and taking full possession, became a powerful agent of modification and exter-