

Elephas primigenius, and the *Rhinoceros tichorhinus*, both of them quadrupeds of which the flesh and hair have been found preserved in the frozen soil of Siberia, occur abundantly, with the bones of an hippopotamus, aurochs, short-horned ox, red deer, reindeer, and great cave-tiger or lion.* A similar group has been found fossil at Maidstone, in Kent, and other places, agreeing in general specifically with the fossil bones detected in the caverns of England. When we see the existing reindeer and an extinct hippopotamus in the same fluviatile loam, we are tempted to indulge our imaginations in speculating on the climatal conditions which could have enabled these genera to coexist in the same region. Wherever there is a continuity of land from polar to temperate and equatorial regions, there will always be points where the southern limit of an arctic species meets the northern range of a southern species; and if one or both have migratory habits, like the Bengal tiger, the American bison, the musk ox, and others, they may each penetrate mutually far into the respective provinces of the other. There may also have been several oscillations of temperature during the periods which immediately preceded and followed the more intense cold of the glacial epoch.

The strata bordering the left bank of the Thames at Grays Thurrock, in Essex, are probably of older date than those of Brentford, although the associated land and freshwater shells are nearly all, if not all, identical with species now living. Three of the shells, however, are no longer inhabitants of Great Britain; namely, *Paludina marginata* (fig. 117, p. 133), now living in France; *Unio littoralis* (fig. 29, p. 28), now inhabiting the Loire; and *Cyrena consobrina* (fig. 26, p. 28). The last-mentioned fossil (a recent Egyptian shell of the Nile) is very abundant at Grays, and deserves notice, because the genus *Cyrena* is now no longer European.

The rhinoceros occurring in the same beds (*R. leptorhinus*, see fig. 136, p. 167), is of a different species from that of Brentford above mentioned, and the accompanying elephant belongs to the variety called *Elephas meridionalis*, which, according to MM. Owen and H. von Meyer, two high authorities, is the same species as the Siberian mammoth, although some naturalists regard it as distinct. With the above mammalia is also found the *Hippopotamus major*, and what is most remarkable in so modern and northern a deposit, a monkey, called by Owen *Macacus pliocenus*.

The submerged forest already alluded to (p. 137) as underlying the drift at the base of the cliffs of Norfolk is associated with a bed of lignite and loam, in which a great number of fossil bones occur, apparently of the same group as that of Grays, just mentioned. It has sometimes been called "the Elephant bed." One portion of it, which stretches out under the sea at Happisburgh, was overgrown in 1820 by a bank of recent oysters, and there the fishermen dredged up, according to Woodward, in the course of thirteen years, together with the oysters, above

* Morris, Geol. Soc. Proceed. 1849.