

valley of the Thames, or both may have alternately prevailed in the same area in the post-pliocene period.

In attempting to settle the chronology of fluvatile deposits, it is almost equally difficult to avail ourselves of the evidence of organic remains and of the superposition of the strata, for we may find two old river-beds on the same level in juxta-position, one of them perhaps many thousands of years posterior in date to the other. I have seen an example of this at Ilford, where the Thames, or a tributary stream, has at some former period cut through sands containing *Cyrena fluminalis*, and again filled up the channel with argillaceous matter, evidently derived from the waste of the tertiary London clay. Such shiftings of the site of the main channel of the river, the frequent removal of gravel and sand previously deposited, and the throwing down of new alluvium, the flooding of tributaries, the rising and sinking of the land, fluctuations in the cold and heat of the climate — all these changes seem to have given rise to that complexity in the fluvatile deposits of the Thames, which accounts for the small progress we have hitherto made in determining their order of succession, and that of the imbedded groups of quadrupeds. It may happen, as at Brentford and Ilford, that sand-pits in two adjoining fields may each contain distinct species of elephant and rhinoceros; and the fossil remains in both cases may occur at the same depth from the surface, yet may be severally referable to different parts of the post-pliocene epoch, separated by thousands of years.

The relation of the glacial period to alluvial deposits, such as that of Gray's Thurrock, where the *Cyrena fluminalis*, *Unio littoralis*, and the hippopotamus seem rather to imply a warmer climate, has been a matter of long and animated discussion. Patches of the northern drift, at elevations of about two hundred feet above the Thames, occur in the neighbourhood of London, as at Muswell Hill, near Highgate. In this drift,