ternative than to avail themselves of such breaks as still remain, or of every hiatus in the chain of animated beings which is not yet filled up. So in geology, we may be eventually compelled to resort to sections of time as arbitrary, and as purely conventional, as those which divide the history of human events into centuries. But in the present state of our knowledge, it is more convenient to use the interruptions which still occur in the regular sequence of geological monuments, as boundary lines between our principal groups or periods, even though the groups thus established are of very unequal value.

The isolated position of distinct tertiary deposits in different parts of Europe has been already alluded to. In addition to the difficulty presented by this want of continuity when we endeavor to settle the chronological relations of these deposits, another arises from the frequent dissimilarity in mineral character of strata of contemporaneous date, such, for example, as those of London and Paris before mentioned. The identity or non-identity of species is also a criterion which often fails us. For this we might have been prepared, for we have already seen, that the Mediterranean and Red Sea, although within 70 miles of each other, on each side of the Isthmus of Suez, have each their peculiar fauna; and a marked difference is found in the four groups of testacea now living in the Baltic, English Channel, Black Sea, and Mediterranean, although all these seas have many species in common. In like manner a considerable diversity in the fossils of different tertiary formations, which have been thrown down in distinct seas, estuaries, bays, and lakes, does not always imply a distinctness in the times when they were produced, but may have arisen from climate and conditions of physical geography wholly independent of time. On the other hand, it is now abundantly clear, as the result of geological investigation, that different sets of tertiary strata, immediately superimposed upon each other, contain distinct imbedded species of fossils, in consequence of fluctuations which have been going on in the animate creation, and by which in the course of ages one state of things in the organic world has been substituted for another wholly dissimilar. It has also been shown that in proportion as the age of a tertiary deposit is more modern, so is its fauna more analogous to that now in being in the neighboring seas. It is this law of a nearer agreement of the fossil testacea with the species now living, which may often furnish us with a clue for the chronological arrangement of scattered deposits, where we cannot avail ourselves of any one of the three ordinary chronological tests; namely, superposition, mineral character, and the specific identity of the fossils.

Thus, for example, on the African border of the Red Sea, at the height of 40 feet, and sometimes more, above its level, a white calcareous formation has been observed, containing several hundred species of shells differing from those found in the clay and volcanic tuff of the country round Naples, and of the contiguous island of Ischia. Another deposit has been found at Uddevalla, in Sweden, in which the shells do not agree with those found near Naples. But although in these three