The science of Palæontology, or as the literal translation of the name indicates, the study of ancient beings, treats of the history of fossils; and its principal end is to make known the forms and the zoological relations of the beings which have inhabited the globe at divers epochs anterior to our own. It has also to fill one of the most remarkable pages in the history of the earth, by retracing the successive phases of the organization of the animals that have peopled it. It has two principal applications—1st, to Zoology, by making known those new or rather unknown forms and conditions of existence which are often wanting in living nature. It may sometimes, by offering new transitions, demonstrate natural relations of which we were ignorant; it re-acts also upon the general laws of comparative anatomy, and has contributed much to its researches and discoveries, and it is connected with all the questions relative to the origin and development of organized beings. 2dly, to Geology—Palæontology again applies to geology, by furnishing the only certain basis for the determination of the stratified earths, and by clearing up several essential points relative to the ancient limits of seas and continents. The study of fossils is destined to throw a great light upon the determination of the order of succession of the beds or strata, and of their relative age. The study of fossils may also enlighten questions of detail. Certain sorts of fish and of mollusca are known to be essentially belonging to rivers, and others to inhabit the seas. If the fossils of an earth belong to the fresh water species, we may legitimately conclude that such earth has been deposited by rivers or by lakes of fresh water. If, on the contrary, the beings that have there left their remains belong to the marine species, it may be presumed that such deposit owes its origin to the waters of the sea.

In latter years fossils have revealed remarkable facts concerning the state of the globe at various epochs. Some authors have sought to make use of them to define the shores and the configuration of the ancient seas; at least, we know that in the deep sea we find fewer molluses than near the coasts: the depth and absence of vegetation cause the greatest part of the species to avoid the centre of the seas; the shores, on the contrary, which furnish a more abundant nourishment, and the rocks near the surface, serve as shelter to a much larger number of individuals. The presence of numerous fossils, and, above all, that of species which belong to the kinds essentially fluviatile, may then serve to indicate the shore of ancient seas, whilst rare fossils of species from the deep seas prove, on the contrary, that the earths where they are deposited have been formed far from the coasts of seas at divers epochs. Thus it will be seen that geology would be but a barren study without some knowledge of the fossil remains of those beings who apparently first peopled the waters of the earth.

An inspection of the various strata in which fossil remains have been deposited serves to prove that, in general, a constant order has existed in their formation. The sea, by which the entire earth appears to have been covered, having rested in certain situations a sufficient length of time to collect particular substances, and to sustain the life of certain genera and species of animals, has been afterwards replaced by another sea, which has collected other substances, and nourished other animals, whose remains are found in each stratum, and are generally limited to one formation, or, if reappearing in a successive stratum, much modified in size or structure. I have prepared here a diagram. which will give you an idea of the succession of epochs; each epoch containing a succession of periods and formations, which, though often found to have been disturbed by some vast convulsive force, can yet be retraced to its natural order of succession and super-position.

The diagram shews those formations which constitute the secondary epoch, or, if described in ascending order, the commencement of that vertebrate existence which left unequivocal evidence of its inhabiting the earth, by leaving the imprint of its footmarks, which, at one time, was all we knew of the extraordinary inhabitants of the New Red Sandstone, when it was called Chirotherium, from the hand-like shape of the foot-marks, until the mighty genius of Professor Owen placed the teeth and head before us, with such indisputable characters as united them to the footmarks, and thus, by induction, the whole animal was presented to us.

Next, in ascending succession, we have the Tethyosaurus, Platyodon, Tenuirostris, and Cummunis, the Plesiosaurus Dolichodirus, as restored by Dean Conybeare, the Plesiosaurus Macrocephalus and Hawkinsii, the latter named by Professor Owen after Mr. Thomas Hawkins, who with great enthusiasm cleared it from its matrix of Lias, and made the first great collection of fossils of the Lias which were purchased by the trustees of the British Museum, where they are now, and form the most striking features of the national collections of fossils.

It next illustrates the upper portion of the Lias, sometimes known as the alum shale, so well developed at Whitby, in which remains of the Teleosaurus have been so frequently found. This animal will be recognised by its near resemblance to the crocodile of the Ganges called Gavial, or Garrial, as it should be called: to the casual observer the principal difference consists in its greater size. The next formation above the Lias is the Oolite, of which at present that singular reptile, the Pterodactyle, represents the inhabitants, while the intermediate formation, called the Stonesfield slate, bears the great discovery of Buckland, the Megalosaurus, or the great lizard. This, the upward strata of the great Oolite, brings us to the formation called the Wealden, which Professor Owen, in one of his elaborate descriptions of the British fossil reptiles, calls the metropolis of the Dinosaurian order, which I have here represented by the best known and most typical species, the Hylæsaurus or lizard of the mud, with its extraordinary dermal covering and long range of dorsal scutes, of which the bones were found by the late Dr. Mantell, whose persevering researches in Wealden formations first gave the idea to science of the former existence of the Iguanodon.

These restorations of the Iguanodon I made from the measurements of the great Horsham specimen, as the largest is called, from its having been found and carefully preserved by Mr. Holmes, surgeon, at Horsham, who has bestowed much care and attention on the development of the great fossils found in his neighbourhood, among which are the largest known specimens of the bones of Iguanodon, having also the greater value of being found altogether, evidently belonging to one individual. These he kindly placed at my service for comparison with the better known Maidstone specimen now in the British Museum, which was so admirably extricated from its matrix and preserved by Mr. Beusted.

This Iguanodon was the animal the mould of which I converted into a *salle a manger*, and in which I had the honour of receiving Professor Owen, Professor E. Forbes, and twenty of my scientific friends to dinner on the last day of the year 1853. This circumstance will best illustrate the great size of these animals, the restoration of which has involved some of the greatest mechanical difficulties that can come within