

The adjustment of the cross wires in the exact sidereal focus of its object-glass is, however, a point of the highest importance.

The author next points out an important advantage which this instrument presents, viz. that of enabling the observer, by varying the inclination of his float, to detect erroneous divisions of his circle by bringing different parts of its arc into use; after which he proceeds to describe an application of his floating collimator, as a permanent verification of the verticality of a zenith tube, and considers that by its use the error, if any, in the zenith distance of a star, will be ultimately referred to inaccurate bisection of the star, or imperfections in the micrometer screws.

*Notice on the Iguanodon, a newly discovered Fossil Reptile, from the Sandstone of Tilgate Forest, in Sussex. By Gideon Mantell, F.L.S. and M.G.S. Fellow of the College of Surgeons, &c. In a Letter to Davies Gilbert, Esq. M.P. V.P.R.S. &c. &c. &c. Communicated by D. Gilbert, Esq. Read February 10, 1825. [Phil. Trans. 1825, p. 179.]*

The bones of the fossil herbivorous reptile described in this paper were discovered in the sandstone of Tilgate Forest in Sussex, which is a portion of the iron-sand formation, and forms a chain of hills stretching in a W.N.W. direction from Hastings to Horsham. In this sandstone the bones and teeth in question are accompanied with those of saurian animals, turtles, birds, fishes, shells, and vegetables, among which may be satisfactorily traced the remains of a gigantic species of Crocodile, of the *Megalosaurus*, and of the *Plesiosaurus*.

The teeth of the three last-mentioned animals are readily recognised and identified; but in the summer of 1822, others were discovered in the same strata, which, though evidently referrible to some herbivorous reptile, possessed peculiar and striking characters. Anxious to ascertain the opinions of naturalists respecting these, the author submitted them to the inspection of the most eminent, and among the rest to Baron Cuvier, who, while acknowledging that such teeth were previously unknown to him, agreed in the conclusion of their belonging to some herbivorous reptile of gigantic size, and recommended every research to be made for more connected portions of the skeleton.

Confirmed in his opinion by these remarks, the author renewed his researches with increased assiduity; and though no connected portions of the skeleton have hitherto rewarded his pains, some of the specimens were discovered in so perfect a state as to allow of a comparison with the teeth of recent *lacertæ* in the Museum of the Royal College of Surgeons; and the result of this comparison was, that in an *Iguana* there deposited, teeth were discovered possessing the form and structure of the fossil specimens.

Drawings both of the recent and fossil teeth accompany this paper, and were exhibited to the Society. They show a striking corre-

spondence in the serrated form of the edges of the teeth, in the ridges on their vertical surfaces, and particularly in the manner in which the new teeth are formed in lateral cavities at the base of the fangs of the old ones.

From the nature of the fossils with which these teeth are associated, the author concludes the *Iguanodon* to have been, if amphibious yet not marine, but an inhabitant of rivers and fresh-water lakes. Judging from the proportions of the recent iguana, he concludes that some of the fossil teeth figured in his paper must have belonged to an individual upwards of 60 feet long.

The author then considers the vertebræ, which differ materially from those of the recent iguana, crocodile, &c., and resemble rather those of the fossil crocodiles of Havre and Honfleur, being depressed at both extremities; but, as among recent lacertæ there are examples of the same structure in a higher degree, and the fossils in question are clearly of the saurian type, he does not regard the discrepancy as sufficiently important to invalidate the conclusions attempted to be established in this paper.

*An experimental enquiry into the Nature of the radiant heating effects from terrestrial sources.* By Baden Powell, M.A. F.R.S. of Oriel College, Oxford. Read February 17, 1825. [*Phil. Trans.* 1825, p. 187.]

In this paper the author first states the opinion of various preceding experimenters on the subject of the heat evolved from non-luminous sources, and from bodies in various degrees of luminosity, and observes that all the facts may be accounted for, by supposing two distinct heating influences, one associated in some very close way with the rays of light, and carried as it were by them through a glass screen without heating it, the other being merely simple radiant heat affected by the screen, exactly as the radiant heat from a non-luminous body.

In order to examine the truth of this explanation, he observes further, that it is not sufficient to observe the effects produced by the intervention of the screen alone, we must combine this with an inquiry into the relations to surfaces of the portions of the heat stopped and transmitted; that is to say, we must endeavour to discover whether the portions differ in any other respect than merely in transmissibility.

To this end the author institutes a set of experiments, whose general principle he states to be, "taking different luminous hot bodies, to expose to their influence two thermometers presenting, one a smooth black surface, the other an absorptive white one: thus obtaining the ratio of their total direct effects on the two, we may compare it with the ratio similarly observed, when a transparent screen is interposed."

After noticing some causes of fallacy necessary to be guarded