crement of weight of the body to be sustained. This is shewn to be attained in the case of bare support, when the modulus of the logarithmic curve is equal to twice the modulus of cohesion of the substance of which the pendant is composed, in feet. Under these circumstances, the depending mass would be just within the limit of disruption, but its strength would be uniform throughout, and the tendency to separation would at no one point be greater than at another. It is not imagined that the Gothic architects could have had a mathematical knowledge of a curve, which was not attained till long after, but the degree of *tact* by which the eye is guided in the selection and adaptation of symmetrical forms seems quite capable of explaining such an approximation to theory, which, it is believed, has not before been noticed. Thus, a depending cylinder appears overloaded at its inferior extremity, a cone towards its middle, and so of all figures which are not concave outwardly.

2. On the occurrence of the *Megalichthys Hibberti* in a bed of Cannel Coal in the west of Fifeshire ; with Observations on the supposed Lacustrine Limestone of Burdiehouse. By Leonard Horner, Esq. F.R.SS. L. & E., and F. G. S.

In a fragment of this kind of coal there was accidentally found a very fine specimen of a tooth, which the author considers to belong to the *Megalichthys Hibberti* of Agassiz. It is similar to some of those found in the limestone of Burdiehouse by Dr Hibbert, and is almost identical with that figured at p. 183 in Dr Hibbert's Memoir, in the 13th volume of the Society's Transactions ; being about two inches long, and seven-eighths of an inch at the base, longitudinally striated, and covered with a shining enamel.

The coal in which it was found was brought from Halbeath, about two miles eastward of Dunfermline. It forms one of the regular coal-measures, being associated with sandstones, shales, clays, and beds of coal of ordinary qualities ; the shells abounding with impressions of plants. The strata are subject to great disturbances, there being five faults in the space of half a mile. There are no trap-dikes, but there is an overlying mass of trap, which the author believes to be connected with a deep-seated dike ; and it is probably to the intrusion of this igneous rock that the disturbances in the stratification are to be ascribed.

The occurrence of remains of the same sauroid fish that is found

in the limestone at Burdiehouse leads the author to inquire, whether there be any analogy between the two deposits: he thinks they are similar; not, however, that he believes there is a freshwater formation at Halbeath, but because he is of opinion that there is no ground for considering that such a formation exists at Burdiehouse, or that the strata there offer any exception to the usual phenomena presented by coal formations; that the bed of limestone is not, as Dr Hibbert maintains, of lacustrine origin, but presents only such characters as may be sufficiently accounted for on the supposition of the coal-measures having been deposited in an estuary, which is now the commonly received theory of the formation of coal deposits in general.

Dr Hibbert rests its lacustrine character on the absence of marine shells; and, in connection with that circumstance, on the abundance of land plants; the presence of what he conceives to be freshwater fishes; and a great profusion of the shells of what he calls a *Cypris*, one of those microscopic entomostraca which inhabit fresh water.

The author, on the other hand, maintains that the absence of marine shells is no proof, because it constantly happens that we find beds of limestone in which not a trace of an organized body can be found, alternating with others nearly wholly composed of them. That the same genera, and many of the same species of plants, are found throughout the whole of the carboniferous series, from the old red to the new red sandstone; that there is no ground for considering any of the fishes to have belonged to fresh water, but that, on the contrary, they are met with in the zechstein of Germany and the magnesian limestone of England, and frequently in other regular coal-formations; and that the shells of entomostraca are by no means a conclusive proof, as the shell of the *Cytherina*, which lives in sea water, cannot be distinguished from that of the *Cypris*.

3. Professor Forbes verbally communicated to the Meeting, that he had succeeded in proving the Circular Polarization of Heat, whether accompanied or unaccompanied by Light; when polarized heat is made to undergo two total reflections within a rhomb of rock-salt, the plane of total reflection being inclined 45° to the plane of primitive polarization.