

their indefinite forms, their want of nodes or appendages, and their markings being always of such a nature as could be produced by scratches of a sharp instrument. Since, however, fishes are yet unknown in beds of this age, they may possibly be referred to the feet or spinous tails of swimming crustaceans. Salter has already suggested this origin for some scratches of somewhat different form found in the Primordial of Great Britain. He supposed them to have been the work of species of *Hymenocaris*. These marks may, however, indicate the existence of some free-swimming animals of the Primordial seas as yet unknown to us.

Three other suggestions merit consideration in this connection. One is that Algæ and also land-plants, drifting with tides or currents, often make the most remarkable and fantastic trails. A marking of this kind has been observed by Dr. G. M. Dawson to be produced by a drifted *Laminaria*, and in complexity it resembled the extraordinary *Ænigmichnus multiformis* of Hitchcock from the Connecticut sandstones. Much more simple markings of this kind would suffice to give species of *Eophyton*. Another is furnished by a fact stated to the author by Prof. Morse, namely, that *Lingulæ*, when dislodged from their burrows, trail themselves over the bottom like worms, by means of their cirri. Colonies of these creatures, so abundant in the Primordial, may, when obliged to remove, have covered the surfaces of beds of mud with vermicular markings. The third is that the *Rhabdichnite*-markings resemble some of the grooves in Silurian rocks which have been referred to trails of *Gasteropods*, as, for instance, those from the Clinton group, described by Hall.

Another kind of markings not even organic, but altogether depending on physical causes, are the beautiful branching rill-marks produced by the oozing of water