

vegetable kingdom so many of them as some of his contemporaries.* The considerations which seem most important in making such distinctions are the following: 1. The presence or absence of carbonaceous matter. True Algæ not infrequently present at least a thin film of carbon representing their organic matter, and this is the more likely to occur in their case, as organic matters buried in marine deposits and not exposed to atmospheric oxidation are very likely to be preserved. 2. In the absence of organic matter, the staining of the containing rock, the disappearance or deoxidation of its ferruginous colouring matter, or the presence of iron pyrite may indicate the removal of organic matter by decay. 3. When organic matter and indications of it are altogether absent, and form alone remains, we have to distinguish from Algæ, trails and burrows similar to those of aquatic animals, casts of shrinkage-cracks, water-marks, and rill-marks widely diffused over the surfaces of beds. 4. Markings depressed on the upper surfaces of beds, and filled with the material of the succeeding layer, are usually mere impressions. The cases of possible exceptions to this are very rare. On the contrary, there are not infrequently forms in relief on the surfaces of rocks which are not Algæ, but may be shallow burrows arched upward on top, or castings of worms thrown up upon the surface. Sometimes, however, they may have been left by denudation of the surrounding material, just as footprints on dry snow remain in relief after the surrounding loose material has been drifted away by the wind; the portion consolidated by pressure being better able to resist the denuding agency.

The footprints from the Potsdam sandstone in Canada, for which the name *Protichnites* was proposed by

* "Impressions and Footprints of Aquatic Animals," "American Journal of Science," 1873.