

FUNDAMENTAL PRINCIPLES OF ICHOLOGY.

The question naturally arises, whether Ichnology has any principles at its foundation on which we can rely, or are its results conjectural; or, to give the inquiry a more scientific form, is there any such relation between the feet of animals and their general structure and character, that knowing the one, we can with strong probability infer the other, as we can determine the unknown quantity in an algebraic equation? We maintain the affirmative, for the following reasons:

1. Comparative anatomy and zoology teach us that an intimate relation exists between all the parts or organs of animals.

2. They teach us that the feet of animals are unusually characteristic, and their relations to other parts unusually clear, so as to furnish, in some instances, a basis of classification to the zoologist. Now a perfect track, especially one in relief, gives a complete model of the foot, and thus furnishes us with a better means of determining the nature of the animal than is sometimes used by the palæontologist, who frequently can obtain only a fragment of some other organ of the animal by which to judge of its nature.

3. We are able, very often, to determine the nature of living animals from their tracks. Who would confound the human track with that of any other animal? or the tracks of quadrupeds with those of birds? or of ruminants with those of the carnivora or marsupials? or among birds, those of the gallæ or waders with those of the web-footed or the pigeons? or those of the ostrich with those of the eagle or albatross?

4. We have the highest authorities for naming animals from their tracks. Such men as Professors Kaup and Richard Owen, Sir William Jardine and Isaac Lea, have done it. Cuvier, too, has said, that "any one who observes merely the print of a cloven hoof, may conclude that it has been left by a ruminant animal, and regard the conclusion as equally certain with any other in physics and morals. Consequently, the single footmark clearly indicates to the observer the forms of the teeth, of all the leg bones, thigh, shoulders, and of the trunk of the body of the animal which left the mark."

PERMANENT CHARACTERS IN THE FEET AND TRACKS OF ANIMALS
BY WHICH DIFFERENT KINDS CAN BE DISTINGUISHED.

We have not space to draw out these characters in detail, nor even to enumerate but the most important. A full enumeration and description may be found in the Report on the Ichnology of New England made to the government of Massachusetts in 1858, page 24.

1. Tracks are of three kinds, 1, a simple trail such as serpents, annelids, molluscs, and perhaps some fishes might make; 2, trails accompanied by the impressions of feet, such as would be made by most kinds of reptiles, some fishes, crustaceans, and some in-