A

DISCOURSE

ON THE

REVOLUTIONS OF THE SURFACE

OF

THE GLOBE,

AND THE

CHANGES THEREBY PRODUCED IN THE ANIMAL KINGDOM.

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IN my work on Fossil Remains, I proposed to determine to what animals those fragments of bones should be assigned which occupy the superficial strata of the globe. It was attempting to traverse the whole of a region of which as yet the first approaches were scarcely known. An antiquary of a new stamp, it was necessary at the same time to restore these monuments of past revolutions, and to detect their meaning: I had to collect and arrange in their original order the component relics; to remodel the creatures to whom the fragments belonged; to reproduce them in their just proportions and with their proper characteristics; and then to compare them with those beings now existing: an art almost unknown, and which implies a science scarcely before even glanced at that of the laws which preside

at the coexistence of the forms of the various parts of organized beings. For such an attempt it was necessary to prepare myself by long and indefatigable researches into the structure of living animals; by a˚ survey of nearly the whole mass of created beings now existing, which alone could lead me to a certain and determinate result in my speculations on the ancient creation: this would at the same time afford me a great result of rules, and affinities not less useful, and the whole animal kingdom would thus, in some measure, become subjected to new laws, resulting from this essay on a small portion of the theory of the earth.

I was supported in my twofold labours by the interest which it seemed to evince both for anatomy, the essential basis of all those sciences which treat of organized bodies; and for the physical history of the globe, the foundation of mineralogy, of geography, and, we may say, of the history of man, and of all which it most imports him to know in relation to himself.

If we are interested in tracing out the nearly effaced vestiges of the infancy of our species, in so many nations utterly extinct, why should we not seek to discover, in the obscurity which envelopes the infancy of the earth, relics of revolutions long anterior to the existence of all nations? We admire that power of the human mind, the exercise of which has enabled us to ascertain those motions of the planets, which Nature seemed for ever to have held from us; genius and science have soared beyond the limits of space; some observations, developed by reason, have detected the mechanism of the world. Would it not be some renown for a man, in like manner, to penetrate beyond the limits of time, and to discover, by research and reflection, the

history of this world, and of a succession of events which preceded the birth of the human race?

Astronomers have advanced in science more rapidly than naturalists; and the present state of the theory of the earth somewhat resembles that of the period when certain philosophers believed heaven to˚ be formed of polished freestone, and the moon in size like the Peloponnesus; but, after Anaxagoras, have arisen Copernicus and Kepler, who paved the way for a Newton; and why should not natural history one day boast also of her Newton?

PLAN.

It is the plan and result of my labours on fossil bones, which I particularly intend to lay before you in this discourse: I shall also attempt to trace a rapid sketch of the means employed down to the present time to discover the history of the revolutions of the globe. The facts which I have been enabled to arrive at form certainly but a very small portion of those of which doubtlessly this history of antiquity was composed; but many of them lead to decisive results, and the severe method which I have exercised in deciding on them, gives me reason to believe that they may be received as assured data, and will constitute an epoch in the science. I trust their novelty will be my excuse, if I ask for them the undivided attention of my readers.

My first object will be to show the relation between the history of fossil bones of terrestrial animals, and the theory of the earth, and the motives which in this respect give it a peculiar importance. I shall then unfold the principles of deciding on these bones, or in other words, of ascertaining a

genus, and distinguishing a species, by a single fragment of bone; an art on the certainty of which rests that of the whole of my labours. I shall slightly notice new species and genera formerly unknown, which I have discovered by the application of these principles, as well as the different kinds of earth which contain them; and, as the difference between these species and those of' the present day is confined to certain limits, I shall show that these limits much exceed those which at present distinguish the varieties of the same species. I shall make known how these varieties are limited, either by the influence of time, climate, or domesticity. I shall thus be enabled to conclude, and enable my readers to arrive at a similar conclusion, that there must have been remarkable events to have effected the great differences that I have detected. I shall detail the peculiar modification which my researches have enabled me to introduce into the opinions at present entertained respecting the revolutions of the globe; and finally, I shall examine how far the civil and religious history of nations agree with the results of my observations on the physical history of the earth, and with the probabilities which these observations give rise to concerning the period when human societies found fixed dwellings and fields capable of cultivation; and when, consequently, they received a settled permanent form.

FIRST APPEARANCE OF THE EARTH.

When the traveller passes over those fertile plains where the peaceful waters preserve, by their regular course, an abundant vegetation, and the soil of which, crowded by an extensive population, enriched