

EVOLUTION

The Age of Man

"A Classic of Science"

Here Lyell Created Consternation Among Conservatives By Coming Out in Favor of Darwin's Evolution Theory

THE GEOLOGICAL EVIDENCES OF THE ANTIQUITY OF MAN with remarks on theories of The Origin of Species by Variation. By Sir Charles Lyell. London: John Murray, 1863. This is an exact reprint of extracts from the original publication.

WHEN SPEAKING in a former work of the distinct races of mankind, I remarked that, "if all the leading varieties of the human family sprang originally from a single pair," (a doctrine, to which then, as now, I could see no valid objection,) "a much greater lapse of time was required for the slow and gradual formation of such races as the Caucasian, Mongolian, and Negro, than was embraced in any of the popular systems of chronology."

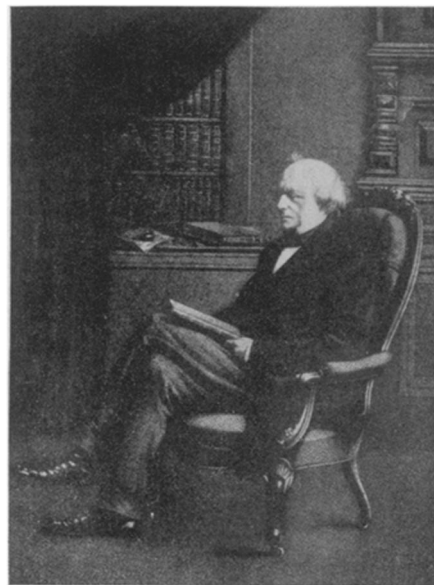
In confirmation of the high antiquity of two of these, I referred to pictures on the walls of ancient temples in Egypt, in which, a thousand years or more before the Christian era, "the Negro and Caucasian physiognomies were portrayed as faithfully, and in as strong contrast, as if the likenesses of these races had been taken yesterday." In relation to the same subject, I dwelt on the slight modification which the Negro has undergone, after having been transported from the tropics, and settled for more than two centuries in the temperate climate of Virginia. I therefore concluded that, "if the various races were all descended from a single pair, we must allow for a vast series of antecedent ages, in the course of which the long-continued influence of external circumstances gave rise to peculiarities increased in many successive generations, and at length fixed by hereditary transmission."

So long as physiologists continued to believe that Man had not existed on the earth above six thousand years, they might, with good reason, withhold their assent from the doctrine of a unity of origin of so many distinct races; but the difficulty becomes less and less, exactly

in proportion as we enlarge our ideas of the lapse of time during which different communities may have spread slowly, and become isolated, each exposed for ages to a peculiar set of conditions, whether of temperature, or food, or danger, or ways of living. The law of the geometrical rate of the increase of population which causes it always to press hard on the means of subsistence, would ensure the migration, in various directions, of offshoots from the society first formed abandoning the area where they had multiplied. But when they had gradually penetrated to remote regions by land or water,—drifted sometimes by storms and currents in canoes to an unknown shore,—barriers of mountains, deserts, or seas, which oppose no obstacle to mutual intercourse between civilised nations, would ensure the complete isolation for tens of thousands of centuries of tribes in a primitive state of barbarism.

Some modern ethnologists, in accordance with the philosophers of antiquity, have assumed that men at first fed on the fruits of the earth, before even a stone implement or the simplest form of canoe had been invented. They may, it is said, have begun their career in some fertile island in the tropics, where the warmth of the air was such, that no clothing was needed, and where there were no wild beasts to endanger their safety. But as soon as their numbers increased, they would be forced to migrate into regions less secure and blest with a genial climate. Contests would soon arise for the possession of the most fertile lands, where game or pasture abounded, and their energies and inventive powers would be called forth, so that, at length, they would make progress in the arts.

But as ethnologists have failed, as yet, to trace back the history of any one race to the area where it originated, some zoologists of eminence have declared their belief, that the different races, whether they be three, five, twenty, or a much greater number, (for on



SIR CHARLES LYELL, 1797-1875

this point there is an endless diversity of opinion,) have all been primordial creations, having from the first been stamped with the characteristic features, mental and bodily, by which they are now distinguished, except where intermarriage has given rise to mixed or hybrid races. Were we to admit, say they, a unity of origin of such strongly marked varieties as the Negro and European, differing as they do in colour and bodily constitution, each fitted for distinct climates, and exhibiting some marked peculiarities in their osteological, and even, in some details of cranial and cerebral conformation, as well as in their average intellectual endowments,—if, in spite of the fact that all these attributes have been faithfully handed down unaltered for hundreds of generations, we are to believe that, in the course of time, they have all diverged from one common stock, how shall we resist the arguments of the transmutationist, who contends that all closely allied species of animals and plants have in like manner sprung from a common parentage, albeit that for the last three or four thousand years they may have been persistent in character? Where are we to stop, unless we make our stand at once on the independent

creation of those distinct human races, the history of which is better known to us than that of any of the inferior animals?

So long as Geology had not lifted up a part of the veil which formerly concealed from the naturalist the history of the changes which the animate creation had undergone in times immediately antecedent to the Recent period, it was easy to treat these questions as too transcendental, or as lying too far beyond the domain of positive science to require serious discussion. But it is no longer possible to restrain curiosity from attempting to pry into the relations which connect the present state of the animal and vegetable worlds, as well as of the various races of mankind, with the state of the fauna and flora which immediately preceded.

In the very outset of the enquiry, we are met with the difficulty of defining what we mean by the terms "species" and "race"; and the surprise of the unlearned is usually great, when they discover how wide is the difference of opinion now prevailing as to the significance of words in such familiar use. But, in truth, we can come to no agreement as to such definitions, unless we have previously made up our minds on some of the most momentous of all the enigmas with which the human intellect ever attempted to grapple.

It is now thirty years since I gave an analysis in the first edition of my "Principles of Geology" of the views which had been put forth by Lamarck in the beginning of the century, on this subject. In that interval the progress made in zoology and botany, both in augmenting the number of known animals and

plants, and in studying their physiology and geographical distribution, and, above all, in examining and describing fossil species, is so vast, that the additions made to our knowledge probably exceed all that was previously known; and what Lamarck then foretold has come to pass; the more new forms have been multiplied, the less are we able to decide what we mean by a variety, and what by a species. In fact, zoologists

and botanists are not only more at a loss than ever how to define a species, but even to determine whether it has any real existence in nature, or is a mere abstraction of the human intellect, some contending that it is constant within certain narrow and impassable limits of variability, others that it is capable of indefinite and endless modification.

Science News Letter, June 17, 1933

ICHTHYOLOGY

Not All Fish Are Voiceless; Some Can Call Their Mates

FISH ARE commonly reputed to be voiceless, yet some species can make sounds that apparently serve as calls to their mates. So stated Dr. Shinkishi Hatai, marine biologist of the Tohoku Imperial University, Japan, before the Fifth Pacific Science Congress. Several species of fish produce distinct sounds, he said, either by friction of the fins, grinding their teeth, emitting air through a narrow passage or through specially developed sound-producing organs. These sounds may serve as warnings as well as for mate-calls.

Dr. Hatai developed this point during a discussion of the sensitiveness of fish and other marine organisms to vibrations in general. A very little movement of a boat's oars, he related, served to attract to his boat numerous specimens of the handsome red Japanese fish called "tai" at a distance of forty yards.

This sensitiveness of fish to changes in their environment, imperceptible to human organs or man-made instruments, may have considerable importance, both scientific and economic, in connection with the almost incessant earthquakes with which Japan is visited. Before two recent rather severe earthquakes the uneasiness of the sea fish in certain regions was noted. On both occasions they consistently refused baited hooks.

The consequences of an earthquake that changes the level of the sea bottom may be revolutionary to the animal societies living on it or in the water above it Dr. Hatai continued. Most bottom communities are adjusted to a given depth of water, as it affects quality and intensity of light, oxygen concentration, and other factors. In turn, these anchored animals and plants are related to the swimming animal population in the

roles of food, shelter, enemies, etc. An earthquake that revolutionizes the life balance on a given stretch of sea bottom may very well ruin a whole fishing community though it does not wreck a house or a boat, simply through the changes it brings to pass in the animal communities that constitute the support of the people.

Science News Letter, June 17, 1933

GEOLOGY

Atlantic Coast Damage Worst in Years

ACCUMULATING reports reveal that the past winter brought the worst damage in years to the Atlantic coast. Numerous buildings and shore structures were battered into a state of wreckage by stormy waves. Abnormal amounts of soil were stolen from the shore line by the sea.

The damage is laid to a succession of extreme storm tides such as occur every 25 to 30 years. In intervening years it is the usual thing for damage to the coast to total millions of dollars, but in years of storm tides the losses pyramid.

In editorial comment on this serious property loss, the *Engineering News-Record* calls upon coast states to take defensive action. Local protective measures against storms and tides are of little effect, it is pointed out, because resistance of any one section of the shore line is interwoven with the resistance of adjoining sections.

Declaring that few states have taken cognizance of the situation, the editor urges that protecting the coast against the sea should be one of the major fields of public improvement construction.

Science News Letter, June 17, 1933

● ▼ **R** **A** **D** **I** **O** ▲ PETROLEUM ON WINGS and WHEELS

by

Dr. Gustav Egloff

Chief Chemist of the Uni-
versal Oil Products Company

Friday, June 23, at 1:45 p.m.
Eastern Standard Time over
stations of the Columbia
Broadcasting System. Each
week a prominent scientist
speaks over the Columbia
System under the auspices of
Science Service.