

The Society's May lecture entitled "DARWIN AND THE FOSSIL RECORD" was given by Professor Richard Fortey of the Natural History Museum, London. His talk covered the history of life on earth over the last 3.5 billion years and how much our knowledge had advanced since 1859 when Darwin had published his book 'The Origin of Species'.

Darwin had realized the limitations of the fossil records, and was not hopeful that many previous life forms would have been preserved, or could be found. He was shown to be too pessimistic, as the discovery of archaeopteryx (a link between the extinct dinosaurs and birds in 1861), proved the existence of missing links. Since then, the fossil record has revealed many intermediate forms. The most important of these are the break-through in evolution which crosses thresholds, for example the ability of life to adapt from sea to land. Fish have been found that have not only lungs, but also a bony skeleton in their fins resembling similar structures in land forms.

The earth is 4.5 billion years old, and the earliest rocks to show simple life forms are approximately 3.5 billion years old. These early rocks found in Greenland, contain primitive cyanobacteria, which are capable of capturing the energy in sunlight and, by absorbing carbon dioxide and giving off oxygen, sustain their own existence. Similar organisms still exist in the form of stromatolytes found in tropical parts of the world.

Gradually by 620 million years ago, many simple soft bodied animals had appeared which took advantage of the increased oxygen produced in the previous 2 billion years. These were the ediacarans. Darwin knew nothing of these, and presumed that life had started in Cambrian times 545 million years ago when, with global warming, there was an explosion of life forms with the appearance of a great variety of shelled and jointed animals in the seas. Although many of these have become extinct, some of their descendants still exist to this day.

Professor Fortey then gave several examples of missing links found since Darwin's time, notably the appearance in Africa of Australopithecus – a link between the many ape like species which had lived in the drift valley of Africa and modern man, caused by dramatic climate change from tropical forests to open grassland five million years ago.

Despite dramatic changes of life forms, certain habitats seem to persist, for example forests and coral reefs. The actual organisms inhabiting these ecosystems, change with time, but the reefs and the forests are still recognizable as a co-ordinated habitat.

Prof. Fortey then went on to explain that several mass extinctions have taken place after severe environmental change, for example, extinction of the dinosaurs after the earth was struck by a meteorite. These extinctions had often led to the success of more complex forms of life, thus crossing further thresholds. The latest threshold to be crossed appeared to be increased intelligence of the mammals, compared with the dinosaurs they replaced. This has culminated in consciousness in man.

One of the problems now to be faced is the disproportionate rise, all over the world, of humans with their demands for space and consumption of resources. This could well lead to the extinction of many other species and ecosystems destroying not only our environment, but our own means of existence.

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