

THE EXPLANATORY POWER OF THE THEORY OF EVOLUTION

By

William Reville, University College, Cork.

The theory of evolution is the central unifying theory in biology. Without this theory there would be no scientific framework to explain the vast accumulation of observations that have been made of the biological world. The theory of evolution by natural selection was a major revolutionary change in thinking when introduced in the middle of the last century. It has widespread implications which many people are still unable to accept.

Very briefly, the modern scientific understanding of the origin of life and its subsequent evolution is as follows. The basic biochemical molecules on which living cells are based arose naturally from simple precursors on the ancient earth about 4 billion years ago. These biochemicals eventually and spontaneously organised themselves into the first living, replicating, biological cell about 3.5 billion years ago.

The information that controls the cell is contained in the biochemical DNA in the form of a linear code, based on four letters. This coded information is faithfully replicated and passed on to the cell's progeny when the cell divides. The cell replication process is very accurate, but, nevertheless, small errors (mutations) creep in over time. Most of these mutations are harmful, produce defective progeny that fail to reproduce, and the mutations are thereby eliminated from the stock. However, some mutations confer a selective advantage on the particular individuals involved, allowing them to adapt better to the environment and therefore to reproduce more successfully than their fellows, and in this way the new favourable mutations spread throughout the population. The theory of evolution proposes that such gradual changes, sieved through this process of natural selection, and operating over billions of years, slowly but surely developed the myriad forms of biological life on earth today, including humankind.

There is a huge amount of experimental and observational evidence to support the theory of evolution. At this stage, in conventional biological science, it is pretty much unanimously accepted that biological evolution is a fact. However, there is still considerable debate about various aspects of the details of the mechanism of evolution.

In my opinion, the weakest link in the explanatory chain of evolutionary developments that I outlined above is the first step in which the primordial biochemicals organised themselves into the first living, self-replicating cell. I cannot see how the first living cell spontaneously arose. Of course, neither can anybody else - the mechanism is presently unknown. Some people have concluded that this step could not have evolved on earth in the time available. They propose therefore that pre-formed life was seeded on earth from outer space. For my part, I am prepared to patiently await the development of a scientific mechanism to explain how life spontaneously arose on earth from non-living biochemicals. If a scientific mechanism is not forthcoming within a reasonable amount of time, then science will have to think again. In that event, the conventional theory of the evolution of life would have to begin with the first living cell, and not with the primordial chemical soup. The only alternative would be to paper over a gap in a scientific scheme with an act of faith!

The theory of evolution has had a profound effect on our psychological orientation to the world. Prior to this theory, humans could legitimately view themselves as special creatures sitting on the pinnacle of creation, chosen to fill this role from the very outset. According to the theory of

evolution, humankind is simply another animal species recently evolved from an ape-like ancestor. It also follows from the theory of evolution that our highest and most prized capacities, i.e. self-consciousness, language and culture, became established by natural selection because they conferred a procreative advantage. Also, there is no obvious place for God in the scheme of evolution - you simply pour in certain chemicals and the right environmental conditions at one end of the scheme, wait a sufficiently long period of time and the present biological world emerges naturally at the other end.

Religion is a powerful comfort to people. It sets out to explain why we exist, how we should live, and it provides the prospect of a spiritual after-life when the body dies. Belief in God is central to Christian religions. While belief in God must rely largely on faith, this will be ultimately unsatisfactory if such a belief can be shown to be unreasonable on the basis of ordinary logic. If one can show that the existence of God is reasonable from logical consideration of the nature of the world, then so much the better. Traditionally there were several respectable logical arguments for the existence of God. One of the best known is the argument from design, formulated in the eighteenth century by the Protestant theologian William Paley. This held that intelligent purposeful design implies a designer. Such design is abundantly evident in the natural world, therefore this world was designed by an intelligence, and this intelligence is God.

The argument from design was good in its time. However, in the theory of evolution, a mechanism is proposed that allows design to arise by the unconscious mechanism of natural selection. The designs that are selected are those that can live most efficiently in their natural environments. There is no need to invoke a Creator to explain biological design.

The fact that the theory of evolution proposes a mechanism with no need for God has naturally upset many religious denominations. The more fundamentalist the religious persuasion the greater is the upset, and such denominations are bitterly opposed to the theory of evolution. There are strengths and weaknesses in a fundamentalist position. One obvious weakness is an inflexibility that prevents reasonable accommodation to developments in knowledge. It is nice to have logical arguments in natural theology to support positions of faith. When these arguments are demolished or greatly weakened by advances in objective knowledge, the only reasonable approach is to replace the old arguments with better ones based on more up-to-date reasoning. Indeed, why can't religion evolve just as the biological world can? The Christian God seems to have no problem with the idea of an evolving religion - compare the New Testament to the Old Testament.

The function of science is to provide natural explanations for how the natural world works. The scientific method has long since proved that it is well capable of doing this. On several notable occasions religion has come off worst when it has denied the validity of new knowledge introduced by science. It seems to me that fundamentalist creationism is now in the process of repeating this mistake. Surely a simple way forward for religion in this matter is simply to say that matter seems to be intrinsically endowed with properties that allow it to organise, replicate and evolve the complex biological structures that we see on earth today, and that this is God's will.

(See illustration below.)



Dinosaur tracks made about 135 million years ago in soft and that was later converted into hard rock. The tracks were found near Fort Worth, Texas, and were made by two dinosaurs, a large four-footed creature and a small two-footed creature. The human figure in the top right-hand of the picture indicates the scale of the prints.

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