

EDITORIAL

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Beyond the Gene and Genome - Are Genome-wise Studies Worth It?

It is a curious human nature that if a certain doctrine is constantly being spoken of favorably by the majority endorsed by the top authorities in their books and taught in classes, then a belief is gradually built up in one's mind, eventually becoming the guiding principle and the basis of value judgment. Darwinism is the core idea of modern evolutionary theory variously called Neo-Darwinism or Modern Synthesis. However, even after 150 years of its publication, the theory remains controversial in many ways. In spite of that, the scientific and popular media propagate it as an accepted scientific theory. Darwinism states that species evolved through gradual changes in the old. Evolutionists interpret the results of their studies to suit this assumption. In spite of the fact that evolutionists have the required tools to alter the genetic make-up of an organism (the genome), they have not been able to change a simple organism like fungus into an equally simple organism like bacterium. But they continue to blindly support the idea of evolution through gradual change.

The current excitement in evolutionary biology is over the 'discovery of a fish species *Tiktaalik roseae*' published in the April issue of the journal *Nature*. It was a predator with sharp teeth, a crocodile-like head and a 4 to 9 feet long flattened body that is thought to have lived in shallow streams about 375 million years ago. The fossils, scientists argue, show how the fish's pectoral fins evolved into the limbs of tetrapods, or four limbed animals. Evolutionists are hailing this new-found species as the "missing link" between the aquatic and terrestrial organisms. Darwin's declaration of the incompleteness of the fossil record created a sticky situation in evolutionary biology; one group of evolutionists started trying to establish incompleteness of the fossil record, and the other group started considering the fossil species as transitional forms ignoring Darwin's view. The discovery of *Tiktaalik* fish fossil as the missing link between aquatic and terrestrial forms of life belongs to the latter group. The claim would have stirred Darwin in his grave, because to him it is not a missing link.

When Dolly the sheep became synonymous with cloning, the world was in awe. But it soon created a storm, as an undercurrent of fear took hold; a controversy that was needless, while making out a case against banning the practice in India. It must be understood that nature has been cloning us since time immemorial. Identical twins are nothing but natural clones. The word cloning, derived from the Greek *klon*, essentially means asexual reproduction. That is why, when the term is mentioned, the concept of artificial cloning triggers off controversy among politician, scientists, theologians, the rulers and the ruled. Beyond the purview of medical, ethical, moral, social and economic issues of cloning, the real issue is the law. Abortions and contraceptive measures became legal, centuries after they have been in practice. By making them legal, better scientific approaches have been possible. Banning abortions and contraceptive practices in some countries has not led to their oblivion. In fact, this has led to people either going underground or moving to places

where it is legal. Banning cloning would lead to the establishment of underground clinics by unqualified personnel. The lure of fame, fortune and fancy and the desperation of many infertile couples may lead to the setting up off “clone clinic” before government wake up and realize the need for organizing and regulating such clinics, as opposed to a blanket ban on the practice of the entire procedure of cloning.

Identical twins are born with the same set of genes. Yet as they grow older, they begin to show subtle differences in their physiology and behaviour. Why? Genetics is not all. An emerging branch called epigenetic is called in to explain the puzzle. The Greek prefix ‘epi’ has been used in a variety of context. In the word ‘epilogue’ it takes on the meaning of ‘after’; in epicenter, it means ‘right above’; in epicarp, it means ‘around’; and in epiphyte and epigenetic, it takes on the sense of ‘over’ or governing’. Epigenetics is the branch of biology which studies the causal interactions between genes and their products, which bring the phenotype into being. Contemporary research in biology shows that that epigenetic was on the right track. It has become clear that the genome does not have just the sequential information stored in the arrangement of the four bases A, T, G, and C in its DNA chain. These are of course important in terms of the words (codons) sentences (genes) and paragraphs and books (chromosomes). But there are additional layers of information stored in the mammalian genome and it is these that we refer to as the epigenome. What we have learnt in recent times is that while genome is the same in every cell of our bodies, the epigenome is expected to be different for each of the 250- odd cell type we have. But the epigenome is under the strict and complete control of environment which means the environment to these 250-odd cells namely weather, nutrition, habits of all kinds, behaviour and relations of friends, relatives, neighbours, enemies etc, sentiments and what not. So human cloning which refers to the cloning of individuals through the use of the so called genome is not going to yield the real fruit of what we hope for. Or in other words, if we want to clone “Gandhi”, the present day cloning, however perfect and precise, can produce individuals looking like “Gandhi”, but to produce “Gandhiji” (the real spirit of cloning) we have to clone also all those who directly and indirectly contributed to the Epigenome of his life, which is humanly impossible.

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