In this issue

Of beetles and biodiversity

There are scientists who choose well-defined areas of research and take rapid strides down the road, discovering and inventing as they go, but seldom looking back. And there are scientists who dream of nebulous worlds to discover – their paths are never straight, they stop occasionally and look around as a passing idea catches their fancy and then wander on.

K. N. Ganeshaiah is one of the latter. As almost everyone who knows him will confirm – what often begins as a simple statement, if Ganeshaiah is present, soon becomes a major discussion and finally, an illuminating paper! In this issue (**page 656**), an extremely famous comment by J.B.S. Haldane has successfully given rise to an interesting discussion on species diversity and how it can be evaluated. On once being asked what struck him most about God, Haldane replied 'an inordinate fondness for beetles'. He was, of course, referring to the amazing number of beetles that exist – almost one out of every four species that share this planet with us is a beetle! Ganeshaiah takes Haldane very seriously and investigates the diversity that this group of insects actually presents in a variety of ways. In the course of this journey, what he discovers is that although species of beetles far outnumber those of any other kind of insects, the number of families in which they can be further classified is not that high. What this implies is that the very large number of beetles that have evolved differ only slightly from each other, individual species of the smaller numbers of flies differ much more greatly. If one thus picks two random species of beetles and two of flies, the probability and extent to which each member of the pair will differ from the other is likely to be higher for the flies rather than for the beetles. In this sense at least, beetles are not so diverse after all!

Ganeshaiah (and admittedly, his other entomologist friends) then made a search for features that have not only ensured the evolutionary abundance of beetles but have allowed this extremely successful group of insects to coexist with each other. Although they could not find any as yet, the important point is that a start has been made.

What implications does this discussion hold for our understanding of biodiversity? It is clear that biological diversity does not depend only on the number of species that constitutes a group, but also on the extent of variation that is present. And any measure of biodiversity has to necessarily consider these before a clear picture can emerge. In a world that is increasinglly waking up to the threat of its rapidly-dwindling number of life forms, it is imperative that we define clearly and examine thoroughly what we are about to lose. So that we can protect it better. And people like Ganeshaiah are clearly showing the way. One wishes that J. B. S. Haldane was here.

The first Indians

'Unity in diversity' has always been a watchphrase for this great nation of ours, the wonder that is India. If one would like to argue against this concept, one needs to look no further than at her people (excluding politicians, of course!). From muted shades to dazzling colours, from languages rich in person, number and gender to those without them, from food cooked invariably in coconut oil to a marked preference for mustard oil – all that one sees around is splendid diversity. Why are we so different from each other? What physical and cultural forces did our forefathers experience that made their children look so different? Look at life so differently? We do not know the answers yet, but what is perhaps possible is to look back far enough and try to see where it may have all begun.

On **page 661** of this issue, is an illuminative review. Barnabas and Suresh take us back to the time when two waves of human migrations reached India. Both these groups of people were possibly farmers but they spoke differently – languages that were later to be called Dravidian and Indo-European. In an effort to trace the roots of these peoples, the authors had earlier analysed the structure of mitochondrial DNA of several present-day Indian populations. The mitochondrial DNA molecule is an unusual one inherited only from the mother and thus, one that can be effectively used to trace one's maternal ancestry. Combining evidence from linguistic sources as well as their DNA analysis, these authors finally suggested that both migrant populations were possibly of Caucasian stock and from Central Asia.

That study and several later ones, howver, rather surprisingly, also discovered the existence, within these groups, of mitochondrial DNA which was typical of Oriental populations rather than Caucasian. What is even more interesting is that it became possible to identify two kinds of Oriental DNA molecules – one more primitive, and the other derived from it – and this led to the discovery that while Indian populations had a very high proportion of the primitive molecule, people in south-east Asia were richer in the derived form. This, together with the fact that the Oriental DNA molecule has been identified in both Indo-European and Dravidian language speakers, seems to not only establish that a 'proto-Indian' stock possibly existed before the two later migrations came into the subcontinent, but

also that this stock may have given rise to the people who later colonized south-east Asia. Support for this comes also from the work of the legendary Luca Cavalli-Sforza and his associates who have been able to detect one such migration that predated the Caucasian one. This was probably the original migration that began in Africa, the cradle of all humanity, when the first modern human beings gradually began to move eastward spreading across Asia, about 40,000 years ago. The first Indians had finally come to stay.

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