
Introductory Remarks

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Introductory remarks

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We hope that in this joint meeting the special knowledge of each contributor will help towards solution of the questions: what is man? where, when and why did he begin? The organization of the meeting jointly by the British Academy and the Royal Society draws attention both to the nature of man and to the difficulties that he meets in describing himself. The characteristics by which human life is maintained are governed in man perhaps more than in any other creature by a double dependence – on capacities acquired by inheritance and on those learned later in life. Moreover, investigations of these two aspects requires different backgrounds and techniques, which we could perhaps characterize as scientific for the study of inherited features and humanistic for the study of learning and culture. To put it differently, study of somatic inheritance requires a knowledge of science while extrasomatic inheritance is concerned with human languages, history and civilizations.

The evolution of man has been very rapid over the last 2 Ma and, at least in the later part of this time, extrasomatic transmission of information has been a major feature of the changes. Since the invention of language, individuals have been able rapidly to acquire detailed information from many others instead of only from two parents. Man evolves fast because of this multi-parental inheritance of information about how to survive. Yet the two methods of transmission are not wholly separate. The capacity to pass information by speech or writing must depend upon very specific characteristics that are inherited through DNA. Certain features of the brain and mouth are needed for speech, and still more complex properties to allow understanding of even the simplest logical propositions. Again, the social system that is necessary for learning and transmission of culture depends upon properties of the brain and endocrine system that reduce aggression, impose restraint and allow cooperation. Five hundred apes would not sit quietly and listen to another ape like the audience at this meeting.

Unfortunately we know very little about the details of the nature or inheritance of the brain features that provide these capacities, though there is already much evidence that humans are genetically programmed for the production and understanding of speech, well summarized by the late Eric Lenneberg (1967). Even if we knew more about the physiological basis of such capacities it is hard to see how we could expect to discover when they first appeared. One clue is that there has undoubtedly been a very great increase in brain size during the last two million years. If the KNM-ER 1470 skull is accepted as belonging to *Homo*, having a capacity of *ca.* 750 ml and dated at *ca.* 1.8 Ma B.P., there has been nearly a doubling since then, with no marked change in body size. This must have been based on genetic changes. No other mammal has shown anything like so rapid an increase. This suggests that the large human brain has a very high survival value and that the capacity for extrasomatic inheritance is somehow connected with brain size, no doubt among many other features of internal cerebral organization that have promoted the exchange of information. Some basic features of operation of the brain

in learning may be common to all humans. For example, as social creatures our brains may be programmed to pay special attention to human features, as a baby certainly does from birth. It is likely that the brain is especially liable to describe otherwise inexplicable phenomena as due to the operation of unseen man-like entities. Anthropomorphism is not a 'primitive' character. I know of no evidence that apes believe in spirits. This is a human characteristic. How far is it determined by heredity? When did it begin? What is its value as part of the human powers of communication and formation of a brain model of the world?

The transmission of culture also depends upon genetic factors that regulate the whole pattern of life of the species, in particular the very long period before the growth spurt and adolescence. A long childhood is found in apes, but that in man is much longer. This must be the result of the action of inherited timing systems, presumably in the neuroendocrine hypothalamus. The arrested development of the gonads ensures the long period of dependence and learning that is the basis of the acquisition of the culture of each group. My own very speculative hypothesis is that this whole human life pattern may be a product of an inherited condition of the pineal gland. The melatonin that it produces certainly inhibits development of the gonads in other animals. Tumours of the pineal may produce precocious puberty, especially in boys (Kappers & Pévet 1979). This inhibitory function may also explain why the pineal becomes calcified in the adult. By then it has finished its main job, if this is to delay puberty. It does not altogether stop producing melatonin, but that does not necessarily invalidate the hypothesis. So, if the pineal makes culture possible, in a sense it *is* the seat of the soul after all, though not for the reason supposed by Descartes! The delayed puberty is a fundamental basis for all human societies, 'developed' as much as 'primitive'. It is certainly controlled by genetic factors that produce endocrine balances specific to man (Young 1973).

I have selected these features of human actions, brains and hormones to illustrate briefly how knowledge about what may be called scientific and cultural aspects of man interact. The great amount of information of the two sorts now available cannot possibly all be acquired by one person, perhaps not even properly understood by any one of us. Yet they *do* interact and the two methods of study merge, especially when we come to examine how man evolved from creatures that had no culture as we know it.

An important question for our discussion will be to try to decide how rapidly man's ancestors passed through the critical stages. According to recent advocates of punctuational evolution great changes might have occurred in small populations even in a very short time (Gould & Eldredge 1977; Stanley 1979). Probably most workers still feel that such transitions were gradual, or at least did not involve very large steps. But we shall only be able to answer such questions when we can identify the nature of the changes that were involved. Some people still seem to think that the qualities to be used for the definition of man are so distinct as not to be open to any sort of scientific investigation. The position of many philosophers is that human beings are characterized as conscious souls who have the unique capacity to make intentional judgements about aims and standards of value. From the way certain people write about such matters you might think that the 'intentionality' and judgement of value do not involve the brain at all. It seems to me that all living things are guided by aims and show intention to achieve them. Is it helpful to use 'intentionality' as a criterion of humanity? The scientific position is that the more we find out about the brain the better we shall understand these and other human features. But of course that is not the only, or perhaps even the best way to study them. All such matters require the *joint* consideration by those who are expert in the humanities and in scientific study.

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There may indeed be some human powers that can truly be described as unique, but most biologists probably believe that all features that we find in man can be traced back to *some* antecedents in animals. I suppose one of the questions for our meeting is: how far is it profitable to pursue this belief? For example, Dr Brown will be telling us whether attempts to teach American Sign Language to apes have helped to understand the origin of language.

If we agree that man emerged gradually, or even by small steps, in a sense it is silly to ask *when* he appeared. Has he fully emerged yet? Perhaps a few hundred thousand years hence our learned successors will laugh as they relate how the creatures of 1980 seem to have supposed that they were already *Homo sapiens sapiens*. However, the title of our meeting suggests that there are some characteristics that define this subspecies. I hope that each of the speakers will try to tell us what these characteristics are from his point of view. I suppose that in trying to find *when* they emerged those who belong to the British Academy will mostly look back from what man *is*, while those from the Royal Society will look forward from what man *was*. Is it possible for the two approaches to produce any agreed consensus about the dates? Perhaps it will be possible to answer that question when I try to sum up at the end of the symposium.

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