

CHAPTER 2

The Anthropology of Choice¹

I greatly appreciate having been invited to speak to the anthropology, archaeology and linguistics sections of the 49th ANZAAS Congress. For me there is a satisfaction in returning to New Zealand, for although I am now an Australian citizen and on the academic staff of an Australian university, I began my life in these islands, with my study of anthropology in the late 1930s at Victoria University College (as it then was) being under the guidance of Ernest Beaglehole.

Beaglehole, having taken his PhD in London, under Morris Ginsberg, had gone on to study anthropology at Yale University with Edward Sapir, one of the founders of modern linguistic anthropology who had himself been a student of Franz Boas. From Yale, Beaglehole did fieldwork among the Hopi, and then in Hawaii and Pukapuka before joining Victoria University College in 1937. As one of his students, I was soon introduced to anthropology, and in 1938 in the student paper *Salient* (which I had helped to found) there appeared my first anthropological article. It was entitled ‘Anatomy of Mind’, argued that the human mind was ‘a social product’, and was illustrated, alack, with a cartoon in which an individual, standing haplessly in the hinder part of a pantomime horse was being told that he was merely the ‘product of his environment’.

As this indicates, cultural determinism was, at that time, very much in vogue, and, understandably enough, one of the books that I had with me in Western Samoa at the beginning of the 1940s, when I first tried my hand at anthropological enquiry, was the late Margaret Mead’s *From the South Seas*, which contained the study for which she is still most widely known: *Coming of Age in Samoa*.

1 An ANZAAS Presidential Address given in Auckland, New Zealand, on 24 January 1979.

As Margaret Mead noted in her preface to *From the South Seas*, the issue 'uppermost in the minds of the scientific world' during the years 1926 to 1928 when she wrote *Coming of Age in Samoa* was: 'What is human nature?'

In 1924, at the height of the Nature–Nurture controversy, Franz Boas, in an article in the *American Mercury*, had pointed to the fundamental need for a detailed investigation of hereditary and environmental conditions. And, the following year, he sent Margaret Mead to Samoa to study 'the extent to which the well-known vicissitudes of adolescents' were 'dependent upon the physical changes through which they were passing or upon the nature of the culture within which they grew up'. It was Boas's view that 'the social stimulus' was 'infinitely more potent' than 'biological mechanism'. In the thirteenth chapter of *Coming of Age in Samoa*, Margaret Mead went even further, claiming, on the basis of her enquiries into adolescence in Samoa, that explanations other than in terms of environmental factors could not be made. This conclusion (which in my view is most certainly not substantiated by the Samoan evidence) was taken up with alacrity by many other anthropologists and soon became central to the widely popular anthropological doctrine in which human nature and behaviour are explained 'in purely cultural terms'.

In September 1978, just half a century after the first appearance of *Coming of Age in Samoa*, there was published, by Harvard University Press, a book heralded as initiating 'a new phase in the most important intellectual controversy' of our times. It was E.O. Wilson's *On Human Nature*, and the controversy, as in the 1920s, is still about Nature and Nurture.

In the opening lines of the first paragraph of this provocative addition to the literature of philosophical anthropology, Wilson poses a question which, as he notes, was judged by Hume to be of 'unspeakable importance'. Significantly, it is the very question — 'What is Man's ultimate nature?' — to which Margaret Mead supposed she had provided a quite conclusive answer in 1928. The answer that Wilson gives to this question is virtually antithetical to that offered by Mead, for although he does recognise the existence of cultural evolution, the essence of his sociobiological argument is that 'the brain exists because it promotes the survival and multiplication of the genes that direct its assembly', from which it follows that 'biology is the key to human nature'.

And so, today, as in the 1920s, the study of Man remains deeply riven. On the one hand, as Stephen Toulmin has recently put it, are those who 'see all human behaviour as one more phenomenon of Nature: who are concerned, that is, to discover in human behaviour only "general laws", dependent on universal ahistorical processes and so free of all cultural variability'. And on the other hand, there are those who 'see Culture as a distinct and entirely autonomous field of study set over against Nature: a field within which diversity and variety are the rule and "general laws" are not to be looked for'.

Like Toulmin, I find this conceptual polarization 'a depressing prospect'. It is a polarisation that will not be transcended until we succeed in establishing, in an evolutionary perspective, the nature of the linkages between biology and culture. My thesis is that one of the most fundamental of these linkages is to be found in human choice behaviour which, as I shall argue, is both intrinsic to our biology and basic to the very formation of cultures.

In *The Selfish Gene* (published in 1976) Richard Dawkins, the Oxford ethologist, deploying sociobiological theory, has argued that human beings, like other animals, are 'machines' created by their genes during millions of years of evolution by means of natural selection. This general view, we must, I think, accept, for, as Dawkins remarks, 'today, the theory of evolution is about as much open to doubt as the theory that the earth goes round the sun'. Yet, as Dawkins himself goes on to admit, there is, in the case of the human species, a crucial limit to the determinative potency of our genes. Thus, in the final two sentences of his book he tells us that humans, alone on earth, are in possession of a 'power' that enables them to 'rebel' against the 'tyranny' of their genes, the 'selfish replicators' of sociobiology.

After all that the sociobiologists have told us of the immense potency of the 'genetic rules of human nature' (to use one of E.O. Wilson's phrases), any 'power' able, as Dawkins admits, to overcome the 'tyranny' of these 'genetic rules' must be formidable indeed. And so, it was with some curiosity that I wrote to Dawkins asking him how he would describe this remarkable and uniquely human power, and putting it to him that what he was referring to could only be, as far as I could see, the human capacity to make choices.

'I cannot disagree with you,' Dawkins replied, 'I am referring to the human capacity to make choices'; and he then went on to add that he suspected that 'the difference between man and other animals' in their choice-making capacities was 'a quantitative difference in amount of complexity'.

Let this then be our starting point: the fact that members of the human species possess a capacity to make choices which, while it is developed to an extent that clearly distinguishes them from other animals, is nonetheless a capacity, biological in origin, which other animals, to a lesser extent, also possess.

This evolutionary fact, I shall argue, is of quite fundamental significance for anthropology, for, when the capacity to make choices is recognised as a biological phenomenon in terms of which we can account for the emergence of human cultures, we can then transcend the primitive, sectarian and unscientific doctrine that culture is 'a thing *sui generis*', a 'superorganic' and 'closed' system in no communication whatsoever with biology.

When he first advanced this doctrine, in the *American Anthropologist* in 1917, Kroeber argued that biology and cultural anthropology were separated by an unbridgeable chasm. Kroeber, it is now apparent, was mistaken in this assertion, for the findings of palaeo-anthropology and archaeology during recent decades have made it abundantly clear that the emergence of human culture is very definitely an evolutionary phenomenon. And this means that in recognising a continuity between genetic and cultural evolution we must also, in our theoretical formulations, attempt to identify the mechanisms that facilitated the emergence of cultural adaptations. It is precisely here, in my judgement, that the human capacity to make choices is of such crucial significance.

In advancing this view, I am, I would note, building on foundations laid by others. For example, in their book *Prehistoric Societies*, first published in 1965, Grahame Clark and Stuart Piggott noted that 'social evolution differed from biological evolution in allowing for the first time an element of conscious choice both to social groups and to individuals'. And, in 1969, Sherwood Washburn concluded his paper 'The Evolution of Human Behaviour' with the words: 'The human way of life maximizes adaptation through awareness and choice, and these abilities depend on human biology'.

Fundamental to my whole argument is Washburn's conclusion that the human capacity to make choices stems from our biology. Thus, accepting scientific materialism, in the same sense as does E.O. Wilson, I am arguing that the human capacity to make choices is phylogenetically given, and so, an entirely natural phenomenon.

In other words, I am suggesting that choice behaviour is part of the human ethogram, as it is of the ethograms of various of the higher animals — a conclusion, I would add, that is in accord with the views of Charles Darwin, who, in his *The Descent of Man*, lists choice as one of the 'faculties' to be found in animals as well as in humans.

Let us then glance, for a moment, at choice behaviour in infra-human animals, it being integral to my argument that the highly developed human capacity to make choices has evolutionary antecedents in the more rudimentary choice behaviour of animals lower in the phylogenetic scale.

Choice, in its basic sense, is a process in which a selection is made between alternatives. And this process, through the operation of some specific mechanism, would seem to be fundamental to the behaviour of virtually all animals. I would particularly emphasise, once again, that the approach I am making to human choice behaviour is strictly within a scientific and naturalistic frame of reference. Accordingly, I am viewing the action of choosing between alternatives as an entirely natural phenomenon, and I do not suppose that humans, in the choices they make, are any more able to depart from the determinisms of Nature than are other animals.

As long ago as 1933, H.S. Jennings, the American microbiologist, observed that 'life is a continuous process of selecting one line of action and rejecting another', and that this applied to all animals, including one-celled organisms. Since then, this fact has been demonstrated in numerous experimental studies, including experiments on the behaviour of such lowly organisms as paramecia, planaria and meal worms.

Recently, indeed, William Baum, writing of animal organisms in general, has advanced as 'fundamental' the proposition that 'all behaviour constitutes choice, because in any set of environmental conditions several alternative activities can occur'.

In studying the process whereby an animal chooses between alternatives, the investigator contrives what is called a 'choice situation', this being an experimentally controlled situation in which it is possible to make more

than one response. From such studies a wide range of 'choices' on the part of animals has now been demonstrated. For example, in a study in which goldfish were exposed to young piranha fish, the piranha showed a marked 'preference' (in 87.9 per cent of trials) to attack the tail area of their prey (Foxy 1972:280). Armadillos, pigeons and cats, in contrast to pigs, goats and humans, have been shown to lack any 'preference' for sweet substances (Kennedy and Baldwin 1972:706). Hens 'given a choice of spending 8–16 hours in a space rather smaller or alternatively considerably larger than that afforded by their home cage prefer the larger space' (Hughes 1975:563). And laboratory rats given a 'choice' between bar-pressing for food, or taking it freely from a dish, greatly prefer to 'freeload' (Tarte and Snyder 1973:128 et seq.).

While explicitly referring to the behaviour of their experimental animals in terms of 'choice' and 'preference', the investigators tend to interpret these selections between alternatives as being wholly or predominantly genetic adaptations. That is, it is concluded that the members of the species concerned have been evolved by natural selection to make fixed 'choices' among the alternatives they commonly encounter in their environments. In some instances, learning and intelligence are also clearly involved; however, all that I want to establish, at this stage of my argument, is that choice behaviour, in the sense that one alternative is preferred (by whatever mechanism) to another, is characteristic of a wide range of infra-human animals.

While very many of the selections between alternatives that animals make appear to be genetically determined, there is also to be found among higher animals various kinds of intelligent behaviour in which the making of choices is a means to an appetitive end. Such choices may be termed instrumental. For example, from experiments with T mazes there have been repeated demonstrations that 'rats will learn to choose consistently the alternative leading to the larger of two rewards' (Hill and Spear 1963:723). In other words, in a T maze a hungry rat will exercise choice in such a way as to maximise its intake of food.

Again, numerous experiments have shown that chimpanzees are well capable of the instrumental use of choice when appetitively aroused. Wolfgang Kohler, in his classic book *The Mentality of Apes*, records many instances of choice behaviour of this kind. For example, when the male chimpanzee Sultan was set a test in which he had to choose between a graph of an empty wooden box and a photograph of the same box

containing bananas, he ‘rapidly succeeded’, Kohler reports, ‘in choosing correctly in about ninety out of every hundred occasions’. In a more recent experiment, at the University of Munster in West Germany, when two of six tools which were known to a female chimpanzee were offered to her, with only one of the pair being a possible means of obtaining food, she chose the correct tool in 238 out of 250 trials — a success rate of about 95 per cent (J. Döhl 1969:200 et seq.).

Instrumental choice behaviour is especially characteristic of primates, and there is now substantial evidence on its crucial role in infra-human culture formation — as, for example, among free-ranging Japanese macaques. In September 1953, on Koshima Island, a female macaque called F-111, about 15 months old, was observed to carry a sand-covered sweet potato to a stream, where she washed it in water, in both hands, before eating it. In so behaving, she was selecting, for the first time in the evolutionary history of Japanese macaques, a quite novel alternative. Precisely how F-111 first discovered that sand could be washed from sweet potato in this way is not known, but almost certainly it was in the course of play, which is closely akin to imagination. What is known for certain is that, having hit upon this specific alternative, she continued to select it. By February 1954, three other monkeys had learned to imitate F-111’s innovative choice, and ten years later 74 per cent of the troop of 59 monkeys had, one by one, made the alternative of washing sweet potatoes a part of their behavioural repertoire, and so a part of the ‘culture’ of the Koshima macaques.

This well-attested historical sequence is of profound theoretical interest, for it clearly indicates the fundamentals of the process of culture formation in infra-human primates. The process begins by the chance discovery, usually by a single individual, of a new and feasible behavioural alternative; this alternative is then selected so that it becomes a part of this individual’s behavioural repertoire; next, the selected alternative is imitatively selected by other individuals until it gradually becomes a widely shared behaviour within their social group; after which it continues to be transmitted, from generation to generation, by way of imitative learning.

It will be discerned that we are here dealing with a process in which behavioural selection or choice is instrumental in bringing into being a new mode of behaviour, the survival of which depends not on any genetic adaptation but on the mechanisms of social learning. Moreover, although the mechanisms involved are decidedly different from those of

genetic evolution, the processes of culture formation (as illustrated by the Koshima example) are every bit as much a part of Nature. We are dealing, in fact, with another kind of natural selection, which, because the mechanisms involved are so different from those of genetics, we must recognise as being, in fact, a second evolutionary system.

Among Japanese macaques this second evolutionary system, which is dependent, as we have seen, on instrumental choice and imitative learning, remains of quite minor importance. Nonetheless, the fact that it is to be found among contemporary infra-human primates is of radical anthropological significance for it enables us to infer that choice and imitative behaviour of at least a comparable kind was characteristic of the hominids, at the time, say, of *Homo habilis*, about 1.75 million years ago.

That this was the case is confirmed by the fact that *Homo habilis* possessed stone tools. As Clark and Piggott have remarked: 'Man's earliest essays in culture are best traced through his artifacts of flint and other kinds of stone'; that is, by what Clark and Piggott have appropriately called 'cultural fossils'.

This concept of a 'cultural fossil' is highly pertinent to my theme, for it refers to artifacts that are quite distinct from the zoological and other fossils that taxonomists classify as the products of the first or genetic evolutionary system; to artifacts, that is, which are due not to the operation of genetic mechanisms but to the innovative behaviour of a hominid; or, to be more precise, to instrumental choice behaviour, for such artifacts can only have resulted from the selection, by their makers, of certain specific alternatives.

We are here at a momentous turning-point in evolutionary history at which a primate, by the intelligent manipulation of possibility, unknowingly embarked on a course that has ended in his becoming that most odd of all Nature's quirks, a predominantly rational animal; one who, whether he likes it or not, has a highly developed capacity for alternative action, and so is, to give a new twist to Aeschylus' words, a 'steersman of necessity'. From this crucial stage in human history, then, we must, as Richard Dawkins has put it, throw out the gene as 'the sole basis of our ideas on evolution'; which means, of course, that from this stage onwards the competence of sociobiological theory to account fully for human evolution comes decisively to an end.

Thus, while genetic evolution actively continues, it is accompanied, from this time onwards, by a new or second evolutionary system, based on different mechanisms, so that from the beginning of the Palaeolithic the genus *Homo*, to use E.O. Wilson's words, has moved on a 'dual track of evolution', with two clearly distinguishable evolutionary systems — the one genetic and the other cultural — in regular interaction.

Furthermore, while at the outset of this 'dual track' the first or genetic system was very predominantly important, this situation, throughout the Lower and Middle Palaeolithic, very gradually changed; and, during the Upper Palaeolithic and particularly since the Neolithic, has been reversed, with the result that from about the time of the invention of writing at the end of the fourth millennium BC cultural evolution has been as predominant in human history as was, formerly, the genetic system.

E.O. Wilson has recently argued that human nature, in its essentials, is the 'legacy' of the 'selection pressures of hunter-gatherer existence', which, extending from the time of, say, *Homo habilis* to the Neolithic, accounts for more than 99 per cent of the 'dual track' of human evolution. Accepting that these selection pressures were indeed of decisive importance, let us consider what the nature of this 'legacy' is likely to have been.

Our best measure of what happened within the 'dual track' of human evolution during the vast length of the Palaeolithic is, as I have already noted, its 'cultural fossils' — as, for example, the hand-axes of the Middle Pleistocene. In discussing a major sequence of these hand-axes (obtained from successive levels through Beds II to IV in the Olduvai Gorge), Clark and Piggott observe that it clearly shows 'how by insensible gradations, handier, and incidentally, more beautiful, tools with smoother working edges were produced from a smaller amount of raw material'.

In these gradations we have an example of how a set of alternatives, having been discovered and then selected to become part of the culture of early man, is both maintained and steadily improved. Up to a point, as Clark and Piggott remark, 'improvement could be made by acquiring greater skill in the use of a hammerstone', but 'no marked or rapid advance' was possible until some individual 'had the idea' (or, as I would prefer to say, selected the alternative) of 'using a punch of wood or bone and striking this sharply at right-angles'. By this means 'it was possible to detach thinner flakes having shallower bulbs of percussion than those removed by hammerstones; and the intersection of shallower flakes produced a more regular working edge'.

The gradual selection, by imitation, of this technical improvement can be traced in the archaeological record, and the whole process, from the initial innovation to its social adoption, would seem to be virtually identical with the instance of culture formation in a troop of Japanese macaques, which I have already discussed. In each instance choice behaviour, as evinced in the taking up of alternatives, is centrally involved.

In the case of early man, with his gathering and hunting economy in which individual and group survival came to depend on the possession of effective stone tools, there would have been a strong selective pressure for the evolution, through genetic mechanisms, of the biological capacities required for the maintenance and improvement of his stone and related technologies. In this way, then, there would have been, throughout the Palaeolithic, a feedback relation, within the 'dual track' of human evolution, between any successful behaviour and the biology that made this behaviour possible. That this is what did occur is evidenced by the changes that occurred in the size and complexity of the brain: and in the archaeological record, in which, throughout the Palaeolithic, the capacity of early man to 'accumulate improvements' in the taking up of newly devised alternatives is displayed, as Clark and Piggott note, in the elaboration and refinement of his stone and other tools.

The basic process, I would argue, was one in which cultural innovations contribute to the generation of selective pressures that result in adaptive changes in human biology. I am inclined then to conclude, following Clark, Piggott and Washburn, that the nascent capacities to imagine and to choose between alternatives that were present among early hominids continued to develop during the ensuing millennia of gathering and hunting. Further, in addition to the kinds of process I have already described in discussing the cultural evolution of stone tools, there were the general demands of a gathering and hunting way of life.

As Laughlin has noted, hunting 'involves goals and motivations for which intricate inhibition systems have developed' and places 'a premium' on 'inventiveness' and upon 'problem-solving'. And gathering, certainly, involves an incessant process of picking and choosing. Indeed, when one ponders the name that Linnaeus conferred on our species in 1758, it has an oddly appropriate evolutionary sense, for *sapiens* is derived from the Latin *sapere*, which refers to discrimination in tasting, and so, ultimately, to the choosing behaviour of our Palaeolithic ancestors.

It is my hypothesis, then, that a principal 'legacy' of the 'selection pressures of hunter gatherer existence' was the cumulative evolutionary development in human biology of the capacities to imagine and to choose between alternatives. I would also suppose that it was the evolutionary developments of these capacities, together with the formation of elaborated languages, that, with other things, made possible the remarkable advance in cultural evolution that occurred from about 40,000 BC onwards.

Washburn has recently suggested that while man 'was surely not mute for most of his development', the 'critical new factor' that provided 'a biological base' for 'the acceleration of history' from about 40,000 years ago onwards, was 'the development of speech as we know it today'. This view is very much in accord with the conclusions of Isaac, who infers, from the available archaeological evidence, that while 'the milieu in which capabilities for language were first important began more than a million years ago, crucial developments in language took place about 40,000 to 30,000 BC; and it would seem likely, as Washburn has proposed, that 'just as upright walking and tool-making were the unique adaptation of the earlier phases of human evolution, so was the physiological capacity for speech the biological basis for the later stages'.

Of the crucial importance of effective languages in these later stages of human prehistory there can be no doubt. What a spoken language provides, with its uniquely human phonetic code, is an extraordinarily potent means of generating new information, a feature which has been well described by E.O. Wilson:

In any language words are given arbitrary definitions within each culture and ordered according to a grammar that imparts new meaning above and beyond the definitions. The full symbolic quality of the words and the sophistication of the grammar permit the creation of messages that are potentially infinite in number.

This means that all human languages possess what Steiner has called *alternity*; that is, they immensely facilitate the conceptualising of possibilities not previously perceived and so generate new alternatives from which choices can be made. With the development of effective languages, then, the second evolutionary system of human populations was transformed, for it was now possible to supplement the observational learning that first gave rise to traditions with a highly efficient symbolic code in which cultural information of all kinds could be stored and transmitted from generation to generation. Man had become a *zoon*

phonanta or language animal, and from the time of the effective completion of this transformation, about 40,000 years ago, his evolutionary history has been mainly cultural. The anthropological significance of this final stage of Man's gradual transition from a preponderantly genetic to a preponderantly cultural mode of evolution is difficult to exaggerate, and E.O. Wilson may well be justified in claiming that the development of human speech represented 'a quantum jump in evolution comparable to the assembly of the eucaryotic cell'.

From about 40,000 BC onwards, certainly, the Advanced Palaeolithic peoples began to explore an ever-extending range of new alternatives, and, towards the end of the Old Stone Age, there was, in the words of Jacquetta Hawkes, a 'sudden emergence of full human creativity' that ranks as 'one of the most astonishing chapters' in all human history, 'It is evident,' Jacquetta Hawkes comments, 'that after hundreds of thousands of years during which the people of each generation normally did exactly what their parents had done and cultural improvement was extremely slow,' the Advanced Palaeolithic peoples had begun to 'think in terms of solving problems'. The evidence for this is a remarkable series of inventions such as the spear-thrower, the harpoon and the eyed-needle, and works of art — all of which I would interpret as having resulted from capacities of imagination and choice which, with the rapid development of language, had suddenly become markedly more effective.

Again, beginning during the Epipalaeolithic and Neolithic periods in the Near East, there was an extraordinary efflorescence of human agency in which a bewildering range of new alternatives was taken up as the numerous civilisations of that region began to form. In contrast to the extreme gradualness of change in the Middle Pleistocene, the human capacity for alternative action was now producing an unending stream of diverse innovations. Indeed, with understandable hyperbole Clark and Piggott have described this process as having been 'infinitely variable'.

Although our evidence is largely inferential, I would suppose that these innovations also extended to human behaviour, and that as new alternatives, good and bad, were taken up in profusion, it became increasingly necessary to devise ethical and legal codes (such as that of Hammurabi, which dates from about 1750 BC) in an attempt to control human conduct as it became ever more imaginatively resourceful — a still-continuing process in human history, as those who have studied computer crime will know. It is in this same historical context, incidentally,

that I would interpret the primeval myth of our civilisation concerning 'the tree of knowledge of good and evil'. Eve and Adam 'fell' because they chose the alternative of not conforming with God's command; which can only mean that they were created with choice behaviour as part of their natures — a form of behaviour so potent, with all, as to outstrip, in the twinkling of an eye, the omnipotence of the Creator himself.

There can really be no doubt, then, that choice, as Kierkegaard once remarked, is 'the most tremendous thing which has been granted to man', for it gives him the power to imitate, if he so decides, either god or devil, and then, should his imagination be sufficiently fecund, to outdo either of them.

It was, I would suppose, this same terrible yet splendid truth about the potential scope of human action of which Epictetus, the Stoic philosopher, was thinking when he remarked that 'nothing but itself can conquer Choice', an aphorism that must surely be most galling to any self-respecting 'selfish gene'.

Such then is the human capacity to make choices, and Kierkegaard's estimate of its tremendousness holds, I would observe, even if one attributes its presence in humans not to a Creator God, but to biological evolution, as do I.

Although it had probably existed from some tens of thousands of years previously, our first substantive evidence of the existence of preferential choice behaviour — that is, choice behaviour characterised by a fully conscious consideration of alternatives — is contained in Egyptian inscriptions of about 3400 BC in which 'some conduct is approved and some disapproved'. Evidence of a comparable kind is to be found in early Sumerian texts, such as the *Instructions of Suruppak*, which date from about 2500 BC, as in numerous other texts from this time onwards.

In the Torah of the nomadic Hebrews, for example, dating from about the 13th century BC, Yahweh is depicted (as I have already mentioned) as setting before his 'chosen people' alternatives of 'good' and 'evil', and then requiring of them that they should enter into a covenant with him to choose as he would have them choose.

As this historically important example reveals, virtually all human laws and rules (from wherever derived) are essentially socially preferred alternatives that have been instituted with the intention, as H.L.A. Hart

has felicitously phrased it, of withdrawing certain kinds of conduct 'from the free option of the individual to do as he likes'. And of all the animals, I would add, only *Homo sapiens*, with his highly evolved capacity for alternative action, has any use for these codes of prohibited alternatives, as also, alas, the penchant endlessly to compile them.

During the 6th century BC a variety of other major ethical systems, including Zoroastrianism, Jainism, Buddhism, Taoism and Confucianism, came into existence, all of them based, as are all human value systems, on the notion of choice between humanly realisable alternatives. And from this same century there is abundant evidence of preferential choice behaviour in texts which have survived from archaic Greece.

So we find Alcaeus of Lesbos, who was a friend of Sappho, writing in about 600 BC:

*Not houses finely roofed,
nor the stones of walls well built.
nor canals, not dockyards,
make the city, but men able to use opportunity.*

While Sappho herself has this to say in one of her touchingly direct poems:

*This way, that way,
I do not know
what to do: I
am of two minds.*

And Theognis, in one of his Elegies, writing in the mid-6th century BC, tells us with the passionate existential anxiety of a character from a novel by Sartre:

*As, for me,
I'm wretched, torn apart and of two minds,
I'm standing at the cross-road wondering
which of two paths to take.*

Here then, in archaic Greece, almost a century before the birth of Socrates, stands modern man, bereft of the blind certainty of both fixed action patterns and divinely sanctioned ritual, having — as both evolution and Prometheus would have it — no choice but to learn to choose for himself. Further, there was also, among the archaic Greeks, a keen awareness of the crucially determinative nature of human choices; as, for example,

in Hieroclis' 'Golden Verses' of Pythagoras (whose Apollonian community flourished in what is now southern Italy in the late 6th century BC) in which there occurs the line:

*You will see that the evils that devour
men are the fruit of their choice.*

These insights from the archaic period were explicated in detail by the great Greek philosophers of later centuries. As Xenophon tells us, Socrates thought that 'everyone acts by choosing from the courses open to him', and it was in this Socratic tradition that Aristotle embarked on his penetrating analysis of *proairesis*, or preferential choice, versions of which are to be found in both the Eudemian and the Nicomachean Ethics.

Aristotle defines choice as 'taking one thing in preference to another', noting that 'this cannot be done without deliberation'. Furthermore, it is from deliberative choice, according to Aristotle, that human rationality springs. This, as Antony Flew has recently pointed out, is a conclusion of fundamental importance. In the light of evolutionary theory it means that rationality, like choice itself, is seen as a biologically based, emergent capacity of the human animal. It is also, I would add, very much in accord with the findings of modern research on intelligence. Colby, for example, has recently described intelligence as being, basically, a 'capacity to select the best action for a particular situation', which means that choosing between alternatives is always involved.

It was also Aristotle's view that rational, deliberative choice, which he regarded as 'the defining characteristic of human beings', was a nascent power that develops only with the acquisition of language and thought. It is thus lacking in infants and young children, as it is in infra-human animals.

This observation is, in my view, of the deepest significance for the student of human nature and of human evolution, for we here have a situation in which we may study the continuing interaction in human life of the first and second evolutionary systems.

Human infants enter this world as the unadorned products of genetic processes, with a limited range of behaviours that are sufficient, with adequate care, for their initial survival and subsequent development. Yet, utterly innocent, as they are, of any of the complex information that is transmitted within human societies by exogenetic mechanisms, they

are still only human beings in embryo. What then ensues, after primary bonding has been established, is a prodigiously complex developmental process in which, as the researches of Vygotsky, Luria and other Russian psychologists have shown, the linguistically coded information of culture interacts with the infant's biological mechanisms to produce, by about five years of age, cortical structures that are basic to the higher psychological functions of a human being and which make further, and advanced, learning possible.

This is all very understandable in evolutionary terms, for, probably for well over 40,000 years, human cultural development has depended specifically on the learning and teaching of linguistically coded information; and, so much so, that, as S.A. Barnett has pointed out, our species, in zoological perspective, may be most appropriately described as consisting of creatures who actively teach their young, and may be named, accordingly, *Homo docens*.

I am, then, in agreement with Stephen Toulmin that it is in precisely this remarkable and far from fully understood developmental process that anthropologists and others, following the lead of Vygotsky, might most usefully study further the interaction of the genetic and exogenetic evolutionary systems in the hope of attaining an integrated understanding of the interrelation of nature and culture.

Aristotle's view that the 'capacity to originate action by choice' is 'the defining characteristic of human beings', although shared by many other thinkers, has been largely ignored by anthropologists; and especially by those for whom customary behaviour looms large, like the social anthropologist whom I once heard remarking on how satisfying it would be to do fieldwork in a society in which everybody behaved in exactly the same way.

In one of the lectures, preparatory to Greats, that he gave in Oxford, Gilbert Murray used to tell his listeners that:

One of the great lessons which anthropology has taught us is the overpowering influence on mankind of tradition and tribal customs, of inherited taboos and superstitions.

He then went on to describe this conclusion as anthropology's 'depressing cordial'.

That many humans are prone, as the researches of Milgram and others have shown, to accept information on authority and unreflectively is undeniably true. But there is also a highly invigorating cordial that anthropology has to offer; for throughout human history there have always been those who have questioned tradition, and who have taken action, often courageously, to bring about humanly valuable changes. The very fact that this has occurred demonstrates to us that a culture is essentially a socially sanctioned accumulation of alternatives that have been selected from the vast range of human possibility. And, this being so, it is always possible for those involved to change in some way, or abandon, one or more of the alternatives of their culture.

And it is this same situation, I would add, that invalidates the once popular doctrine of cultural relativism which maintains that human cultures, varying as they do, are not open to any kind of critical evaluation. In fact, human cultures vary as they do precisely because it is possible for human populations to choose between alternatives. But choice, in contrast to natural selection, is by no means necessarily adaptive, for when made in ignorance a choice may have unforeseen consequences of a highly deleterious kind.

And so, as Washburn and McCown have noted, 'major human misconceptions are built into the basis of every cultural system'; from which it follows, I would argue, that a scientifically informed and humanistic anthropology must make a critical approach to cultural practices and values, rather as does experimental science to knowledge.

Science, as Popper has shown us, is a process whereby 'our explanatory myths become open to conscious and consistent challenge' and by which we are 'challenged to invent new myths'. Quite integral to this process is the operation of intelligent choice. As Bronowski has pointed out, when an individual proposes an hypothesis he is, in fact, making an imaginative choice; after which, his hypothesis is tested against the relevant experimental and other evidence, this evidence being allowed to decide the issue. Science is thus a value system, based on choice, for we can practise science only if we seek the truth by choosing in strict accordance with the experimental and other evidence. And so, as Jacques Monod has expressed it, 'objective knowledge cannot exist, cannot begin to exist, unless there is an active choice of values to begin with'.

This example clearly demonstrates the radical role of choice in the practice of science, which, as we all know, is an immensely potent method for obtaining accurate knowledge about the natural world. Yet science, significantly enough, is just not able, of itself, to provide us with decisive judgements about human values. Why should this be? The reason, I would suggest, is to be found in the fact that human values owe their very existence to the exercise of choice, and so are, in fact, no more than selected alternatives.

For science, obviously, all feasible alternatives are equally a part of Nature, which means that the most that science can ever do is to provide us with the fullest possible information about the characteristics and likely consequences of the alternatives between which our choices are made. And so, it is human beings, and human beings alone, who possess the capacity to choose between the alternatives which they are capable of enacting. And this means that when it comes to values, crucially important as they are in determining the ends of our actions, we have no course but to rely, finally, on our own powers of judgement, wise or foolish as they may be.

This conclusion, which is revealed by any searching analysis of the nature of the human capacity to make choices, was, in fact, reached by Aristotle in his *Magna moralia* where he contrasts science, which proceeds by 'demonstration and reason', with wisdom, which has to do with 'matters of action, in which there is choice and avoidance, and it is in our power to do or not to do'. Wisdom then, as Aristotle indicates, stems from the human capacity for alternative action, for, possessing this capacity, it becomes possible for individuals to make choices ranging from the abysmally foolish to the supremely wise, and so, wisdom is an ideal, highly appreciated in all human cultures.

One of my main conclusions then is that there is a need for a critical anthropology of human values. Human cultures being value systems are 'experiments in living', and a critical anthropology would be concerned with assessing the consequences of these 'experiments in living' in the hope that we might gradually learn to select our values with greater wisdom.

Finally, I return to the question I posed at the outset, first in the words of Margaret Mead, and then in the words of E.O. Wilson: 'What is Man's ultimate nature?' What kind of answer is to be given to this question — said by Hume to be of 'unspeakable importance' — in the light of my analysis of the anthropology of choice?

As anthropological and historical research has shown, the members of the human species are capable of a seemingly endless range of actions. Thus, as S.A. Barnett has expressed it:

We are not, by our 'nature' obliged to adopt any particular habitat or diet; our infants can be reared in a variety of ways; and our patterns of social interaction (despite a few universal signals) are bewilderingly varied.

And even these universal signals, I would add, are open to our penchant for contrary effects that stems from choice. For example, the eyebrow flash which Eibl-Eibesfeldt describes as 'universal and stereotyped' is, nonetheless, as Eibl-Eibesfeldt himself documents, given various cultural meanings, ranging from a factual 'yes' in Samoa to a factual 'no' in modern Greece.

We here have a decisive demonstration of the way in which the human capacity for alternative action is able to modify the significance of a phylogenetically given form of behaviour. It is this same capacity that makes possible the bewildering variety of human actions, and its expression is made virtually limitless by the possession of language.

The answer that I would give then, to E.O. Wilson's question, is that humans, with their biologically given and culturally nurtured capacity for alternative action, cannot be said to have any kind of 'ultimate' nature. Indeed, I would argue that because of the way in which humans are able to create and select their own values, *Homo sapiens* can only be defined, if at all, as being, for better or for worse, a self-defining animal.

As it happens, virtually this same notion was expressed as long ago as 1793 in the answer that William Blake gave to the question: 'What is Man?' Blake's inspired answer, in his book for children, *The Gates of Paradise*, was to depict a human infant as a chrysalis, and to append the words:

*The Sun's light when he unfolds it,
Depends on the Organ that beholds it;*

so indicating that we have the invigorating potentiality, through our choices, to create our own worlds of meaning. It is to this luminous and profoundly human conclusion that the anthropology of choice leads.

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