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THE HUMAN RECORD

Anthropology, as it developed in the latter part of the last century, took as its central, if not sole, field of interest the attempt to discover and explain human progress from the emergence of man before the Ice Age many millennia ago down to the complex life of civilised peoples in the modern world. It sought not only to range both living races and fossil remains of extinct forms in a succession of advancing forms, but to formulate broad sequences of discovery and invention by which new crafts and ways of life developed, and to trace the birth and development of cosmological, religious and moral ideas, and the elaboration of social institutions from the family to the state.

Such a programme was not new. It had been the subject of considerable speculation in classical thought and of more critical elaboration by the rationalist philosophers of the eighteenth century, who shared Hume's view that the history of mankind had been one of "gradual improvement from rude beginnings to a state of greater perfection." The nineteenth century anthropologists had, however, the great advantage of being able to set their studies within the wider framework of the considerable geological and archaeological knowledge that was then accumulating and of the theories concerning biological evolution that were then being elaborated.

The essential postulates of these biological hypotheses were that there

was an inherent propensity for variation among the offsprings of any organism, so that minute differences among the descendants were continually occurring, giving rise to new varieties, and also that any and every form of living organism was subject to selection, that is, to preservation and increase or ultimate extinction according to its success in the biological environment in which it found itself. Such ideas were obviously suggestive for understanding not only the biological evolution of man, but also the successive development of crafts, ideas and social institutions of increasing complexity and specialisation in human societies. The early anthropologists accordingly viewed particular cultural features and social institutions as patterns of human behaviour, the distinctive character of which had been built up by a long succession of small changes and adapted by selection to particular conditions of life. They regarded the maintenance of any particular socio-cultural pattern as dependent on adequate adaptation to human needs and the material environment and its capacity to withstand the pressure of other better equipped peoples.

But, encouraged by the success of evolutionary theory in biology in the interpretation of the growing body of fossil evidence concerning the emergence, proliferation and extinction of various species and genera at successive periods of the earth's history, they were also led to attempt formulations, analogous with those of the evolution of life forms, concerning main phases of the cultural and social evolution of man. The fragmentary character of the ethnographic and archaeological data then available was, however, a considerable handicap and also a temptation to speculation. Here, moreover, the new biological doctrines were often misconceived and misapplied. The doctrine of biological evolution by variation and selection placed great stress on progressive diversification among living organisms, and hence on the multiplicity of forms and species that were derived from a common ancestry. But the early anthropologists tended merely to borrow the biological notion of progressive elaboration of living forms in certain lines and apply it universally and speculatively to cultural and social changes through time, thus arriving at oversimplified schemes of unilinear evolution held to be applicable to mankind at large.

The processes of development in crafts, economic life, government, and beliefs all tended to be oversimplified in this way. For each a succession of more or less fixed stages was postulated—stages through which any and every human group, unless retarded by adverse circumstances, would pass. Man, beginning as a hunter, tamed his game and became a pastoralist; this stage in turn was superseded by a more productive agriculture. A

promiscuously interbreeding human horde gave rise to a universal system of intermarrying clans, from which by slow degrees the monogamous family emerged. Initially perceiving the universe as manipulated by mysterious forces, man devised magic rites to control them until, conceiving of divine personages in his own image, he rejected magic and developed religion, which progresses towards monotheism until, in the view of some, it is superseded by modern science.

Such abstract stages, unlike palaeontological phases such as the "Age of Reptiles," which they sought to imitate, had no location in the space-time of an actual evolutionary process based throughout on actual cultures of the past. Plausibility was given to them only by selecting isolated crafts, customs and beliefs, and social institutions from particular peoples past and present and claiming these as indications and examples of such stages in an upward progress from savagery through barbarism to civilisation.

Such views and the schemes of "evolutionary stages" in which they were expressed obtained a wide vogue and are indeed still regarded in some quarters as definitive anthropological findings. But they often retarded and distorted ethnographic study by encouraging investigators among particular peoples to seek only for illustration and confirmation of preconceived schemes, and later progress of ethnography and archaeology provided increasing evidence of the diversity of cultural and social types, the inadequacies of such over-simplified formulations becoming increasingly apparent. The consequent attack on notions of unilineal evolutionary stages in the development of culture and society often failed to discriminate, unfortunately, between these theories and the concept of evolution in its true sense. The latter is the hypothesis of the successive emergence, radiation and dominance of increasingly complex cultural and social patterns as a result of the continuous action of such basic processes as the tendency for variation in human behaviour and the acceptance and widespread imitation of innovations that prove adaptive and productive for individuals and groups in given material and socio-cultural environments.

The attention of many ethnologists over the past fifty years has been largely devoted to the task of demolishing concepts of simple evolutionary stages. But in so doing, some have been led into a denial not only of any relevance for evolutionary concepts but also of the value of any attempt to analyse and formulate general principles with reference to the progressive elaboration of cultural patterns and social organisation that is a matter of record for the history of *Homo sapiens*. This has even led some anthropologists into a cultural relativism which has confused subjective value judg-

ments with objective criteria of socio-cultural differentiation. This has been carried to the point at which such ethical and political questions as to whether western peoples ought to dominate, displace or otherwise affect the lives of primitive peoples, are confused with questions as to whether and in what ways any given cultural and social patterns are, on the basis of relevant extrinsic criteria, more complex, more productive and more viable than others.

Meanwhile, however, archaeological and ethnographic researches over the last two generations have greatly extended our knowledge of the actual cultural history of man and of the varieties of cultural patterns and social organisation among different peoples, past and present. It has therefore become more feasible as well as more important to attempt, on the wider empirical foundations that are now available, a reconsideration of the general character of the cultural record of mankind and of the general processes of development that are to be discerned. For contemporary thought, including discussions of the *raison d'être* and the future of industrial civilisation itself, such a review has a particular interest. In terms of the total history of man, which can reasonably be given a span of some five hundred thousand years, the period of conventional history, the last two thousand years, from the beginnings of the Graeco-Roman unification of the Mediterranean world to the present early phase of social adjustment to large scale industrialism, is but the latest chapter in a far from finished story. The general trend is better seen in a consideration, however summary, of the total record, than in a minute scanning of the most recent entry.

The results of three generations of systematic archaeological and ethnographic research show that in a manner somewhat analogous to the successive radiations of new biological forms, new and more complex cultural patterns have emerged dramatically at certain periods, expanding and at the same time diversifying to embrace larger segments of a growing world population. Needless to say, the archaeological character of the data relating to earlier periods sets limits to the kind of knowledge we may gain. More precise and far-reaching conclusions and comparisons are possible in such fields as technology, economy and art, than in the spheres of belief, morals and social organisation, for archaeological, unlike documentary or ethnographic materials, can only rarely provide direct information concerning ideas or social relations. But this parallels the situation with regard to palaeontological information available for the study of biological evolution, and, as in that case, when the data are appraised thor-

oughly and critically in the light of direct knowledge of processes in living forms, significant, if limited, inferences can be reached despite the fragmentary and selective character of the material.

For the reconstruction of the earlier cultural history of mankind, the dating of traces of extinct cultures is vitally important, and systems of relative chronology have been worked out by various methods. These are based on correlations with geological horizons for the more remote periods. Fluorine content affords an index of the age of fossil bone. The stratification of material in occupied sites and the associations and overlaps of typological sequences of artifacts in different sites and regions are available for later periods. Absolute dating has, however, presented greater difficulties. In the Ancient East it has been possible for over a generation to estimate the antiquity of the neolithic and later prehistoric phases by working back from the oldest documents that can be linked to calendrical records, and the main phases of the prehistory of Europe have been approximately correlated in this way back to c. 3000 B.C. In the arid areas of the southwestern United States it has been found possible by dendrochronology—the matching of overlapping annual growth rings on tree trunks out for building in prehistoric times—to establish absolute dates in our calendar extending back to the beginning of the Christian era.

But the most dramatic possibilities have emerged only recently with the development, by W. F. Libby and others, since 1950, of a method of dating organic archaeological remains by the measurement of the radioactivity of their carbon content. This promises to provide a means for securing an absolute chronology for prehistoric cultures extending back as far as twenty-five thousand years—the limit of the radioactive cycle of carbon 14. It depends on a reasonable hypothesis that the radioactive carbon 14 that is continuously formed in the upper atmosphere has remained constant everywhere and that the proportion of carbon 14 particles taken up by living matter has been likewise constant. At death, living matter begins to lose its radioactive carbon at a steady rate so that the residual radioactivity of an archaeological specimen of organic origin, such as wood or bone or fibre, affords a measure of the antiquity of the artifact. This method, dependent as it is on the life of the carbon 14 isotope, is limited to an antiquity of about twenty-five thousand years or the later part of the Upper Palaeolithic in Europe. It is also subject, by current techniques of estimation, to a statistical error of several centuries, but this is small for the more remote periods in comparison with the guesswork

of estimates by earlier methods. While the carbon 14 methods is still experimental and problems of the contamination of specimens remain, tests on more recent objects already dated by other means have given remarkably exact results within the anticipated margins of error. The method is already being applied extensively in the New World, where the prehistoric chronology had for most areas been highly conjectural, and has yielded remarkable and often surprising but, on the whole, consistent results. A most important point is that as it is applied more widely, it will make it possible to link together on a common and absolute scale, the cultural successions in different regions as worked out by the field archaeologists and so establish the comparative chronology of prehistoric cultures throughout the world with a considerable degree of certainty.

The widespread existence of human populations in the Old World during the Pleistocene Ice Age was first established barely a century ago by the geological dating of chipped stone tools, that afforded cutting instruments for early men. Fossil remains of man, however, are generally few and isolated for the earlier periods, so that despite great advances in our knowledge of the variety of early Pleistocene (Lower Palaeolithic) cultures, attempts at correlation of the early stone-age cultures with particular species of *Homo* remain speculative. Knowledge of the distribution of man and of the development of human cultures during the Pleistocene, formerly confined to western Europe, has, however, been greatly extended by the researches of the last generation.

Throughout the long Lower Palaeolithic phase which probably extended over hundreds of thousands of years and persisted in Europe until the third retreat of the Northern and Alpine ice sheets, two distinct basic techniques for flaking and shaping stone implements persisted and are known to have extended over wide areas from Central Asia and India to Southern Africa and Europe. The characteristic tools of these two distinct traditions, known in their classic forms as the so-called hand axe (a bi-face or core tool of the Abbevillian-Acheulian tradition) and the Levallois flake, a thinner ovoid tool of which a series could be successively struck from a specially prepared nodule, may have originally been developed and diffused among distinct populations, for the Levallois flake has a more northern, and the hand axe a more southern distribution in Eurasia. But there is increasing evidence that both these techniques and tool types were included in the repertoire of some early groups, while other early and distinct traditions in the making of stone tools have been discovered, such

as the Lower Pleistocene Kafuan-Oldowan pebble tools of East Africa, the early pebble-axe chopping tools of southeast Asia, and the Clactonian flakes of northwest Europe.

Of the human fossils at present known as belonging to the Lower Palaeolithic, none are of *Homo sapiens* type and in all there are anatomical indications that their brains were inferior in development. On the other hand, there is some evidence, such as ritual burials, that these individuals possessed the distinctively human capacity for symbolisation and probably speech. The Neanderthal species of *Homo,* the first for which a specific and associated cultural equipment can be fully established, occupied Europe and parts of southwest Asia before and during the early part of the last glacial advance, the Wurmian, in Europe, using stone tools of forms derived from several Lower Palaeolithic traditions. In Europe Neanderthal Man appears to have been completely displaced early in the Wurm glaciation by *Homo sapiens,* who arrived there for the first time equipped with stone tools of new types.

The Upper Palaeolithic industries which appear with modern man in Europe during the last period of glaciation at the end of the Pleistocene, but may well be older in regions to the south and east, show considerable technical advance in manufacture and a greater specialization of forms. Many of the tools were intended not for direct use, but for the manufacture of other implements in bone, ivory and wood. Missile weapons were important, as is shown by the use of the spear thrower and the bow, for neither of which is there any evidence in Lower Palaeolithic remains. Advance in skill and organisation in hunting, and the addition of fishing to the economy, permitted larger communities and the more continuous occupation of dwelling sites. While the Lower Palaeolithic phase in Europe was immensely long enduring, a conservative geological estimate allows some four hundred thousand years, the Upper Palaeolithic and the post-glacial Mesolithic food-gathering cultures of Neanthropic man, *Homo sapiens,* although they cover by far the greater part of the history of our species, lasted, on a generous estimate, for less than one hundred thousand years, before they began to be supplemented by the cultivation of plants and the domestication of animals.

Although there is considerable evidence that the new "blade" and "graver" tools of the Upper Palaeolithic in Europe were introduced from elsewhere by several Neanthropic immigrations, clear indications of the sources both of the new tool forms and of *Homo sapiens* await further advances in the archaeology of other regions. In Europe and adjacent areas

where it is best known, the Upper Palaeolithic phase was, however, a period not only of notable cultural innovation, but also of increased regional specialisation. Distinct "races" of *Homo sapiens* type developed a variety of stone blade and bone tools and various local cultures emerge. The well-known Magdalenian of west-central Europe, with which the later cave paintings of France and northern Spain are associated, was but one of the last of these. Contemporaneous with them, but with distinct repertories of tools, were the Hamburgians in North Germany and the Creswellians in England. Other blade and, later, microlithic industries have also been recognised in northern, eastern and southern Africa during the Upper Pleistocene, and the manner of their development from Lower Palaeolithic flake tools is suggested. But the elucidation of their chronological and possible cultural relations with the industries of Upper Palaeolithic Europe await further research. But, although the archaeological record is very fragmentary outside Europe, it is clear that *Homo sapiens* had spread in a number of varieties throughout the Old World by the end of the Pleistocene and that both Australia and the New World had been reached. The later Palaeolithic cultures everywhere show considerable local variety suggesting both a wealth of innovation, new adjustments to local conditions with a continual, if limited, expansion and migration of successful groups.

Co-operation among geologists, palaeobotanists and archaeologists has also succeeded in establishing in remarkable detail the character and the environmental context of the sequence of innovating cultures which developed in the forests and along the shores and lakes of northwestern Europe in the immediate post-glacial period after about twelve thousand B.C. Artifacts of wood such as canoes, paddles and traps, and later pottery, have been preserved to give a fuller picture of the ecological adaptations of these populations to this new environment.

It was only some six or eight thousand years ago that the foraging, hunting and fishing economies to which all known human communities had hitherto been confined were effectively supplemented for the first time in the Old World by the development of grain cultivation and stock breeding in the seasonally watered and lightly wooded grasslands east of the Mediterranean. Although an example of a proto-agricultural community is known in the Natufian of Palestine, the details of the processes and conditions whereby these momentous innovations were established, which made still larger and more stable human communities possible, remains to be discovered. But it is clear that within a thousand years grain

growing and the raising of stock spread widely over western Asia, and into Europe. This culture was generally associated with the manufacture and use of ground—as distinct from chipped stone tools, and has become known as the Neolithic phase. Although the initial stages in the cultivation of wheat, barley and later millet or of the domestication of pigs, sheep and cattle have not yet been identified, the character of the early Neolithic economy and its cultural settings, over a wide range of varying habitats from the Iranian Plateau to the English Downs, are fairly well-known as a result of excavations and comparative studies carried out over the past twenty-five years.

Early Neolithic communities were small populations of twenty to thirty households generally dependent on shifting cultivation to maintain their grain harvests. But unlike the hunting economies of Palaeolithic and Mesolithic man, a food surplus was increasingly possible in some environments, which permitted not only the growth and proliferation of communities, but the release of energy for other activities, including new crafts. Hand-made pottery, weaving of simple textiles (usually in flax) and more elaborate dwellings and other structures, were generally adopted. This Neolithic economy practised by the enlarged semi-sedentary communities to which it gave rise, early extended along North Africa and up the Nile valley to the Sudan. By sea it was early carried to the islands of the Mediterranean. It was successfully introduced and adapted to new vegetational conditions in the wood lands of central and western Europe. While this rapid expansion resulted in large measure from the continual hiving off of segments of expanding communities to new areas, there is also evidence in Europe of the diffusion of neolithic crafts to the Mesolithic aborigines of the areas newly colonised. Archaeological evidence for an early extension into eastern Asia is generally lacking, although the early prehistoric painted pottery of North China where there were already primitive agricultural communities some five thousand years ago, may prove to be related to the early neolithic wares of southwest Asia.

Despite the clear evidence of an initial formation of the assemblage of neolithic crafts in the Middle East and its widespread diffusion from this region, it is by no means definitively established that this was the only region in which men independently developed primitive cultivation and a settled life in the Old World. Biological evidence, notably the genetics of domesticated plants and animals, and the existence of distinct techniques of cultivation, suggest that there was an early development of root cultivation and the rearing of pigs and chickens in southeast Asia. Whether this

development was independent or touched off by stimulus diffusion ultimately derived from the Middle East but without the actual transmission of western cereals and stock, will remain uncertain until the age and context of these southeast Asiatic developments are determined through future progress in archaeological research.

It was, however, in the Middle East again, facilitated it would seem by the devising of a more productive system of irrigation agriculture and the larger scale of social organisation which this demanded, that still greater technical advances followed in rapid succession over the next 2,000 years. New crafts including the smelting of copper and the manufacture of bronze for cutting tools, the use of wheeled vehicles and the plough, led to an increasing specialisation of labour, a more extensive system of exchange and progressive increases in the scale and the degree of centralisation of society. This gave rise to the succession of city states and later empires of the Ancient East from the third millennium B.C. in the wide zone from the Nile to the Indus. Deriving their food supplies by plough cultivation of cereals and other crops, and equipped with increasingly specialised tools, utensils and ornaments by highly skilled artisans, they developed a complex organization of exchange and written records under systems of centralised government. By one thousand B.C. the manufacture of iron, which for the first time provided an abundant material for cutting tools and manufactures of many kinds, had been generally adopted.

Some of the crafts of these urban civilisations of the Ancient East were early and progressively introduced to the surrounding "provincial" peoples still living in small separate communities, whose cultures were thereby enriched and specialised in various ways and their social organisation correspondingly elaborated. This process has been closely studied in Europe, where from two thousand B.C. the complex cultures of the European Bronze and Iron Ages were developed. On these foundations, the classical civilisations were later developed in the Mediterranean, while in eastern Asia, influence of the higher civilisations of the Ancient East were probably strong. The establishment of bronze manufacture in Shang times in North China coincided with the predominance of wheat, a western plant, as the food staple there, and the adoption of many other west Asiatic elements which provided the technical foundations for the development of the early state system of China.

Meanwhile, pastoral nomadism, developed by marginal peoples in southwestern and central Asia as a specialised economy, and providing horsemen of high mobility, made possible remarkable, if short-lived,

militaristic organisations on a large scale. This equestrian pastoral economy and the striking specialisation of techniques and tribal organisation to which it gave rise, and which so vividly impressed classical writers, was regarded by many of the older evolutionists as a second stage in the development of human economies which developed from hunting and preceded agriculture. But it is now clearly to be seen as a late development that derived not only its livestock, especially cattle and sheep, but also its essential means of mobility, horse riding, and still later the pack camel, from the older centres of sedentary civilisation. Equestrianism, which belatedly followed chariot driving in the Ancient East around 1500 B.C., appears to have become general in the outer grasslands by the beginning of the first millennium B.C. It provided for the first time the human mobility prerequisite on the steppes for extensive seasonal migrations and access for trade or tribute to the settled areas at the margins. A more rewarding life than hazardous farming along seasonal streams or hunting in the wooded lands to the north became possible and, by its means, Scythians, Tartars, Huns and Turks successively dominated for centuries large areas of the Eurasiatic grasslands and their margins. It appears from recent archaeological research that a similar process, reproduced on a smaller scale, occurred over two thousand years later in the New World, when the horses of the Spaniards and the French became available to the Indians on the margins of the Great Plains of North America.

The outlines of the early cultural history of Eurasia are sufficiently clear to show how a succession of discoveries and inventions made in different, but interconnected centres, gave a progressively greater control over natural and human resources which diffused to other regions and everywhere resulted in both a growing complexity of cultural apparatus and an increasing scale of differentiation of social organisation. Despite the setbacks or stagnation of some peoples, there were always centres of advance and the cultures of the multiplying human societies were continually diversifying. This record also confirms the 19th century hypothesis that savagery (food-gathering), barbarism (non-literate primitive cultivators) and civilisation (literate societies organised in states with specialised occupations and a hierarchical structure) were consecutive stages in the sociocultural history of the Old World. On the other hand, it equally refutes any idea that there has been an inevitable tendency for all peoples to pass autonomously and successively through such stages. The developments have depended on specific discoveries and their application and combination in a few major centres of innovation.

In tropical Africa, archaeological research is in its infancy and the ethnographic record there is also very incomplete. But there are no indications that the early Neolithic complex of the Ancient East was able to breach the Sahara and there is so far no evidence of an early phase of trans-Saharan "Bronze Age" cultures. On the other hand, millet cultivation and the rearing of small stock and later cattle, probably derived from south-west Asia, afforded an early basis for sedentary and expanding populations in the Ethiopian highland zone whence various elements expanded westward and southward over the tropical grasslands of the Sudan and East Africa. Meanwhile, south Asiatic food plants, of which the yam and the banana were outstanding, were also introduced into eastern Africa and carried westwards to provide the staples for the development of agricultural communities in the Congo-Guinea forest zone. The rearing of large cattle, which led to the development of predominantly pastoral communities in eastern Africa and the western Sudan, appear to have depended on later influences from the north.

At the time of tropical Africa's discovery by the Europeans, nearly all its agricultural peoples had iron tools and the technique of iron smelting was widespread. The periods and contacts by which this craft first penetrated remains unknown. But hunting peoples survived until a few centuries ago over considerable areas in eastern and southern Africa and the forests of the Congo basin. Indeed, the expansion of agricultural and pastoral tribes at their expense was far from complete at the time of the first European penetration. The Bushmen of southern Africa, who were then being driven back by the expanding southern Bantu cattle-keeping peoples, still retained a mesolithic equipment and economy.

Thus, although the Sahara appears to have interposed a considerable obstacle and cultural filter between Tropical Africa and the north, there are many indications of recurrent influences from the later civilisations of the Ancient East and the Classical Mediterranean on the population of its southern flanks in eastern and western Sudan. These were probably intensified after the introduction of the camel into North Africa around four hundred A.D., which afforded a means of desert transport, and contributed to the development of large centralised states in this zone, that were already well established early in the Christian era and prior to the spread of Islam. The extent of pre-Islamic maritime contacts from the north down the eastern coasts of Africa also remain to be explored. But beyond the Sudan, the cultural impact of the higher civilisations of the Middle East and the Mediterranean appears to have been of low intensity,

and such crafts and ideas as undoubtedly reached its peoples from outside were adapted and refashioned in relation to local developments. It is only in the large detached island of Madagascar that, in the Indonesian speech and many cultural features of the Malagassy, there is clear evidence of any overseas colonisation and the abrupt introduction of a new cultural pattern.

Beyond the mainland of southeast Asia, human populations are likely to have already colonised New Guinea, Australia and Melanesia in the late Pleistocene and there is evidence that several distinct racial stocks were involved. But the archaeological knowledge needed to determine the periods and phases of such movements is thus far lacking. While, however, many of the east Asiatic food plants and animals were later carried through New Guinea and Melanesia, they were never established in Australia, where an archaic hunting economy using the spear thrower, but not the bow, persisted into modern times. It is unlikely that the northern coasts of Australia remained unvisited by technically more advanced peoples from Papuo-Melanesia, and some north Australian coast craft point to such contacts. But these appear to have resulted in little cultural transmission. The orderly patterning of relations between kin both within and between the small hunting hordes and the elaboration of tribal rituals in Australia suggests that this may in part have been due to a long established cultural orientation that was resistant to the adoption of new crafts or modes of organisation in the absence of substantial colonisation.

The outer archipelagos of Oceania, in Micronesia and Polynesia, may not have been colonised by man much before the beginning of the Christian era, when a complex series of movements by sea, which appear to have derived ultimately from advanced cultures in Indonesia, began. southeast Asia is certainly the source of the Austronesian languages of Oceania, which are also found over much of New Guinea and Melanesia where some migrants are likely to have remained. The limitations of oceanic canoe transport and of the resources of the islands themselves are generally invoked to account for the technical simplicity of the Micronesian and Polynesian cultures, which were nevertheless characterised by features of social organisation, ritual, and religious ideas that suggest reduced and refashioned versions of southeast Asiatic patterns of rank and ceremonial. Subsequent contacts between Polynesia and the New World may have occurred, and migrations into the Pacific from the northwest coast of America, which was itself probably affected by late migrants from

east Asia, have been claimed on the basis of some similarities in art style. Heyerdahl's drift voyage on an Inca-type raft from Peru to the Tuamotus has also strengthened the probability of the occasional but perhaps always involuntary arrival of migrants from centres of higher civilisation in South America. Such contacts, however, like the original oceanic migrations eastwards from the Asiatic mainland, appear to have been only sporadic; while, within Oceania, after the great dispersion of the Polynesians, the several islands and island groups for the most part lost contact with the outside world.

Geologically speaking, man appeared only recently in the New World. No evidence exists there of any extinct form of *Homo*, and *Homo sapiens* was clearly an immigrant from the Old World. The limitations imposed by the configuration of the continents restricted any early route of entry to the regions of the Bering Strait and, in the absence of any stone tools resembling in form Palaeolithic industries of the Old World, it was long argued that man arrived only in the Recent, i.e. Postglacial, geological period, and perhaps as recently as five or six thousand years ago. But both the antiquity and the number of human movements into the Western Hemisphere now seem likely to have been greater than was formerly thought. Human artifacts which must be dated to at least the later parts of the Ice Age have, during the past twenty-five years, been recognised over wide areas. By then the High Plains of North America, to the east of the Rockies, were occupied, as is shown by specialised but widespread stone spearheads, known as the Folsom points, by peoples hunting now extinct species of bison, mammoth, horse and giant sloth. One Folsom site has been found, by a carbon 14 dating of associated bones, to be about twenty thousand years old. A heavier and rougher but apparently related type of spear point known as Clovis, which has been established stratigraphically as older at one site, has been recorded from areas as widely dispersed as Alaska, Georgia, and Costa Rica. Other tool types more reminiscent of some Old World Middle and Upper Palaeolithic types, have also been identified and simple bone tools have been recorded from a number of sites. From Central Mexico come tools which are held to resemble the Lower Palaeolithic pebble axes of eastern Asia. With such forms is associated a fossil human skeleton, the Tepexpan Man, now claimed to be eleven thousand to sixteen thousand years old on carbon 14 dating. There are, therefore, likely to have been several Palaeolithic migrations of groups of *Homo sapiens* into the New World, facilitated no doubt by the fact

that the Asiatic temperate fauna, which could provide game, reached North America by way of the Bering Strait during some phases of the Pleistocene, when there were long periods of mild climate and lowered sea levels to provide a land bridge. Too little is yet known of the Palaeolithic cultures of northeast Asia to attempt to characterise or date such movements.

In early postglacial times, chipped stone tools of different styles, including the widespread Yuma type of spearhead, which is found as far south as Central Mexico, were used by hunting peoples, whose equipment shows further advances such as bone needles. Then, still later, from some time after about five thousand B.C., a wide range of new devices appears over wide areas in North America. These, by their character and distribution, suggest further migrations from northern Asia, for this "Archaic" Forest culture of the New World corresponds in many of its techniques and adaptive features, though not in its detailed forms, with that of the Mesolithic fishing and woodworking peoples of northern Europe. It includes specialised projectile points, a variety of polished stone tools likely to have been used especially for woodworking and betokening a more sedentary coastal or riverine pattern of life with a considerable increase of population. Variants spread down the Pacific coastlands in the west and across and down the forests of northern and eastern America. In the northern forests the culture persisted without substantial modification, until a further and complex series of impulses from northeastern Asia during the last thousand years B.C. gave rise to the first Arctic Whaling and later Eskimo cultures. But as it spread south, this Archaic fishing and hunting culture was greatly diversified and in the eastern forests of North America there were successive advances in technical equipment permitting greater density of population and size of communities. The use of pottery had developed among the resulting "Early Woodland" cultures somewhere between two thousand and one thousand B.C., and thence spread westward into the Plains. By the latter date maize cultivation had reached it from the south, coming ultimately from middle America. Thence, too, later influences stimulated elaborate rituals and the growth of larger centres of population in what is now the southeastern United States. In the more arid and open country of the southwestern interior of North America, which had probably been unoccupied during a previous desertic phase, a primitive form of maize reached the sparse hunting and foraging peoples before one thousand B.C., according to recent carbon 14 datings, to give rise to the earliest Mogollan farming communities in the central and southern parts

of what are now New Mexico and Arizona. A superior type of maize, together with potmaking in styles derived from Central Mexico, were not established there until around two hundred B.C., following which, during the first millennium A.D., village life developed in a series of diversified cultures of the Southwest, that were ancestral to the historic Pueblos.

Meanwhile, more complex cultures had developed in the tropical highlands to the south. The context and chronology of these great advances in middle America still bristle with unsolved problems to which increasingly elaborate techniques of analysis and field study are being devoted; but the broad character and phases of development have been established. Sedentary life in small agricultural communities had become widespread over the great area extending from central Mexico to western Peru well before the beginning of the first millennium B.C. Nearly everywhere this was founded on the cultivation of primitive forms of maize, beans and cotton, to which many other plants were added later in different areas. Pottery, too, soon became universal. The location and character of successive advances are for the most part still uncertain, but they were advances within a single cultural continuum whereby, through processes of diffusion, intermingling and combination of successive discoveries and crafts, a widespread neolithic village economy with varying regional peculiarities of invention and style was established. These differences in style and emphases persisted in the later developments when around one thousand B.C., over two thousand years later than in the Ancient East of the Old World, several more complex civilizations were gradually built up in central and southern Mexico and in western Peru. In the former, the Maya and Teotihuacan civilisations had emerged by one thousand A.D., with their specialised handicrafts, monumental temples, elaborate ceremonialism, calendrical systems and glyph writing, while the separate and distinctive, but equally complex, Chavin and Tiahuanco civilisations had developed successively in highland Peru and provided the foundations on which the widespread Inca Empire of the fourteenth century was based. Despite the advanced skills in many spheres, the development of large urban populations and the organisation of wide territories comparable with the empires of the Ancient East appear to have been hampered in the New World by the lack of domestic animals for traction and transport, which restricted production, the movement of supplies and swift communications. The Inca, seeking under these difficulties to control the wide areas they conquered, were compelled to devise an extremely rigid social organisation to compensate for technical limitations.

There is, so far, no clear evidence of specific derivations from the Old World cultures in the earlier developments of agricultural communities in Middle America, although there is still a baffling problem concerning the origins of cotton, on which geneticists differ, and, as the complexity of the genetic history of maize has become more apparent, there have been claims for a southeast Asiatic source for its primitive form. Sporadic trans-Pacific connections between Old and New World cultures in the later phases is more probable, since there is not only a strong evidence that certain food plants spread across the Pacific from the New World in pre-Columbian times, but there are certain elements in, for example, the art style and ceremonial of the late Maya that resemble contemporary southeast Asiatic forms. Within the New World, however, the widespread and crucial effects of the diffusion of crafts, beliefs and ritual patterns from Middle America over surrounding regions are patent. In North America the cultivation of maize, beans, squashes and cotton spread northwards almost to their climatic limits save where desert mountains shut off central California. These cultivated plants provided the foundation for sedentary populations in the Southwest and facilitated the further development of the Eastern Woodland cultures in the east. Southwards, these same plants were also extended through most of the vast tropical forest areas of the Amazon and Chaco, although maize did not generally supersede the root crop, cassava, which may have been brought independently into cultivation as the staple of small village communities in the tropical forests. The southern grasslands of the New World were not, however, opened to agriculture and remained in the occupation of nomadic hunting peoples until European conquest.

A review such as this of the cultural history of man in its broadest aspects serves to demonstrate the essential fluidity of cultural patterning that springs from the human capacity for innovation, communication and learning. The cultural assemblage of any human group, however large or small, however "primitive" or "advanced," is not a simple product of internal development in response to local conditions, for its elements were, in a large measure, derived from a multiplicity of contacts and transmissions over long periods of time. The local and internal development has been one of selection and mutation. In this sense, but in this sense alone, is any particular cultural pattern distinctive and unique. At the same time, such a culture can never be regarded as static and fixed. Quite apart from sudden and extensive intrusions and reorganisation in response to new external contracts, or drastic alterations in physical conditions, the pro-

pensity for innovation will continually produce variations on existing themes, some of which, influenced by subtle internal changes, are likely to find acceptance.

Thus, although the nineteenth century conceptions of a unilineal and progressive development open to all peoples have long been discredited, the explanatory value of the basic concepts of evolution for an understanding of the cultural history of man is confirmed by such ethnographic and archaeological knowledge as we now command. Human cultures and social systems have shown the same general trend towards increasing complexity and differentiation through time as that found in organic evolution and there are many analogies with organic evolution in cultural development. Culture as an emergent manifestation of the most elaborate life form shows the same propensities as are found in organisms for the development of new forms and functions, for the radiation of such forms as are more successfully adjusted to a given range of environment, and for the reduction or extinction of other forms with which these compete successfully.

But the processes involved in socio-cultural evolution differ basically from those in the organic field, for they are psychological and not genetic and the units of modification are societies, not individual organisms. They also include processes of transmission and assimilation which are not matched at organic level. For, whereas organic evolution depends on the transmission, perpetuation and recombination of new biological features or mutations though the processes of reproduction and genetic inheritance, cultural mutations arise from the innovations of socially stimulated individuals, depend for their social acceptance on their functional congruence with an existing socio-cultural pattern and are maintained only by precept and learning.

If a cultural innovation secures acceptance in a population, the new patterns of activity and thought can not only be transmitted to all appropriate members of that and succeeding generations. It can be extended by diffusion to all the other receptive populations in contact with it. Cultural and social evolution can accordingly proceed much more rapidly to produce a wider range of variations, and, at the same time, a successful cultural pattern can radiate much faster than a biological species. The result is, accordingly, not the production of a new species composed of many members closely resembling one another, but a new source of diversity in the many communities that come under the influence of a radiating cultural innovation.

The wide extension of comparatively few standardised tool forms

among the early human communities of Palaeolithic times shows clearly how widely and firmly particular techniques can be diffused over vast but thinly populated areas and transmitted down many generations. It is likely that this wide acceptability and persistence is a function of the contribution that such devices made in the given conditions to the better maintenance and survival of the multitude of local groups that adopted and retained them. This process of wide diffusion and long persistence of cultural patterns of basic survival value is to be soon repeated with later discoveries and inventions. It can be reliably inferred that the human populations of the Palaeolithic, and in but slightly less degree of the early Neolithic phase, were segregated into a multitude of small and closed groups between which there were only intermittent or indirect contacts through relations of local alliance. But these were sufficient to ensure that new devices and styles in tools and art could become known and accepted over wide areas. The evidence from later archaeological periods and from ethnography shows this to have been equally true of effective concepts, symbols and techniques in the sphere of religion and political organisation.

The cultural record also shows clearly that from their small and highly discrete beginnings, human societies have tended to increase in scale wherever technical advances, whether in the production of resources or the improvement of transport and communications, have taken place. Thus there has been a concomitant process of accumulation of cultural devices which have increased the members and life expectancies of men and of social devices for integrating them into ever larger and internally more differentiated social systems.

This evolution towards an increasingly wide integration of cultural pattern and social life has progressed to the point at which we can already speak in a real sense of a world culture pattern within which particular features, known or significant only for particular peoples or statuses, are nevertheless specialised components or peculiar variants of a wider whole. At the same time, there is to-day hardly a community that is not, again in a very real sense, socially a sub-segment of one or other of the few politico-economic systems into which the two thousand million human beings alive to-day are organised. This is a far cry from the situation that we can reasonably infer existed when *Homo sapiens* first expanded over the Old World to spread the beginnings of the Upper Palaeolithic cultures. Mankind then consisted of a few hundred thousand living beings dispersed into a multitude of virtually closed societies, each a few dozen strong.

From this point of view the cultures and social systems of mankind

have undoubtedly evolved. New and more complex behavioral patterns with capacity for wide radiation have successively emerged as a consequence of the high propensity for innovation and learning of the human species. Finally, it should be said that this propensity must be regarded as innate, and that cultural elaboration and the expansion of social systems are inherent characteristics of man. Particular configurations like Roman engines of war, the ceremonies of the Aztec, or slave plantations, may prove to be cultural mastodons doomed to disappear in competition with more flexible forms. But while any given civilisation—in the sense of a particular socio-cultural configuration—may, indeed will, disintegrate, when it ceases to be adaptive to changed circumstances or powerful competitors, the process of cultural evolution and social elaboration will not cease so long as there are human beings alive.