'NEW MEN, STRANGE FACES, OTHER MINDS': AN ARCHAEOLOGIST'S PERSPECTIVE ON RECENT DISCOVERIES RELATING TO THE ORIGINS AND SPREAD OF MODERN MAN

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Introduction

SIR MORTIMER WHEELER always emphasized that archaeologists are digging up, not things, but *people* (Wheeler, 1954, 13). He then went on to show that it is field-work—systematic survey and excavation—that is the only acceptable basis for the hypotheses on which the archaeologists make their interpretations or, in modern parlance, construct their models. But *things* reflect the ways in which people make and use them—the technological proficiency of the makers, their mode of livelihood, even their thought processes and ethical beliefs. For the more remote periods of prehistory, however, when the earliest manifestations of tool-making occurred of which evidence is sometimes found associated with the hominid fossils, as much reliance is placed on the anatomical characteristics of the fossils themselves as on the tools for showing how these earliest ancestors may have behaved. But, with the advent of Modern Man, early in the later Pleistocene, the variability by that time manifest in the archaeological assemblages in all inhabited regions of the Old World and the adaptive patterning this implies are the clues to understanding something of the behavioural diversity that is the special characteristic of our own species.

In what I now have to say we will pass in review the facts concerning the fossil remains of man and his tools over that crucial period of time when Modern Man, *Homo sapiens sapiens*, made his entrance upon the world stage. Some of these bones and stones

represent substantial evidence. Others are less satisfactory and some are probably downright misleading did we but know it! The palaeoanthropologist today is only too conscious of the variable nature of the data but, through the interdisciplinary team approach that is nowadays the norm, we are better equipped than ever before to analyse them and to make more consistent use of the synthesizing process. Even so, we are still a very long way from producing answers to some of the questions and problems of which this review will treat. However, even though the conclusion must be, so to speak, inconclusive, I hope the review will show the vitality and enthusiasm with which the planned search is conducted and the understanding it is providing of where we have come from and wherein our chances of survival may lie as well as the sheer excitement of the future potential of palaeoanthropology.

The appearance of Modern Man is the most significant event in the whole long record of mankind's biological and cultural evolution. He successfully replaced the Neanderthalers and all other contemporary hominid forms within a few thousand years and, by the end of the Pleistocene, 10,000 years ago, he had pushed into almost every corner of the Old and New Worlds. The speed with which these developments took place was phenomenal when compared with the change from *Homo erectus*, via the earliest forms of *Homo sapiens*, to Neanderthal. The accompanying change from the Lower through to the end of the Middle Palaeolithic took nearly twice as long. And the evolutionary process that brought about the transition from the earliest tool-making hominids with their basic and generalized stone tool equipment to the early *Homo sapiens* stock represented by the Neanderthalers with their much more varied tool-kits, lasted nearly fifty times longer (Clark, 1975, 179–84).

Theories of Man's Descent

It seems evident that such rapid and accelerating biological evolution was made possible in great part by the increasing efficiency of man's technical skill and the success with which hominids were able to adapt their behaviour to ecological change and to the occupation of new environmental niches. That Modern Man—*Homo sapiens sapiens*—was possessed of intellectual and technical abilities in advance of all other forms of men, effectively eliminated any possible competition and, down the ages, these qualities have manifested such potential that they have given him mastery of the world with prospects of also extending this to outer space before too long. Recent discoveries show that modern forms

of man were everywhere dominant from 35,000 to 30,000 years ago and it is unlikely that any archaic *sapiens* or Neanderthal remains will be found that are younger than 30,000 BP (Trinkaus and Howells, 1979).

'Modern Man' is characterized by a lighter skeleton showing reduced muscularity as compared to the Neanderthalers. His brain was the size of ours. He had a high brow with a shorter face and a jaw with a chin and small, regular teeth. Rearrangement of the organs of the throat, especially the pharynx, enabled him to develop the complex speech systems we use today, while the artistic and aesthetic achievements of his culture show intellectual capacities and a reasoning ability akin to our own. By contrast, Neanderthalers were more muscular and robust, with a flatter forehead, a protruding face, and a chinless jaw. Otherwise they were not all that different from ourselves though intellectually less flexible. This change in muscularity and robustness is perhaps one of the most significant since it implies a major modification in the way they performed the assorted tasks of daily life (Campbell, 1976).

The earliest populations with fossils that are anatomically modern belong in contexts which are interpreted in either of two ways. They can be regarded as showing *hybridization* of early modern stock with Neanderthalers, or as being representative of the genetic modification inherent in the emergence of a *new* stock. Resolution as to which hypothesis is the more likely must rest with the anatomists and anthropologists and does not lie within the competence of the present writer. Since also it is the cultural evidence that will mostly be discussed here, the fossils themselves will be reviewed only for the implications and inferences that can be drawn from them about the nature of the technological component with which they are associated and thereby the abilities of these early modern populations.

Crucial to the problem of man's origins and evolution is the reliability of the dating evidence. Although, since the advent of radiocarbon, this is very much more acceptable, it is still far from adequate since the lower limit of the method extends back only to the end of the Middle Palaeolithic and of Neanderthal man. However, there are now prospects of being able to extend reliability back to 100,000 years ago by various carbon isotope enrichment processes (Muller, 1977; Hedges and Moore, 1978). By correlating results from these with others obtained using the uranium decay series dating, fission track, thermoluminescence and archaeomagnetism methods, a great deal of the present

uncertainty in archaeological correlation of Middle Palaeolithic assemblages and Neanderthal fossils is likely soon to be eliminated or considerably reduced. In particular, where *suites* of dates are available, we can have confidence that cultural assemblages and fossils can be correctly chronologically ordered.

For the present, therefore, the general consensus among archaeologists and anthropologists is to recognize a 'Neanderthal grade' of hominid evolution showing a wide range of variation and lasting from about 100,000 to about 35,000 years ago. This includes not only the better known classic and early Neanderthal populations of Europe, concerning which a large bibliography exists, but also the related and contemporary populations and individual fossils of 'progressive Neanderthalers' from the Middle East and central Asia. Less closely related anatomically but sharing similar general characteristics are fossil remains from Africa, north and south of the Sahara. From the original *Homo erectus* stock in Africa (e.g. Koobi Fora ER3733 and ER3883; Olduvai OH9; Ternifine) there appears to have emerged, early on during the late Middle Pleistocene, perhaps 300,000 years ago, an early *Homo sapiens* grade of man possessing heavy brow ridges and a large, robust face but a relatively less robust post-cranial skeleton (e.g. Kabwe, Saldanha, Ndutu, Bodo). Sometimes known as 'rhodesioid' after the *Homo rhodesiensis* fossil from Broken Hill (now Kabwe), these are not classic Neanderthalers though they have shared attributes. They are examples of a very variable African *sapiens* grade in which the early emergence of modern characteristics is clearly demonstrated. Associated faunal and cultural remains and other evidence suggest that these fossils fall within the chronological range of other early sapient fossils such as Swanscombe, Steinheim, Arago, Petralona, and early Neanderthal man in Europe (Howells, 1973, 83–128; Campbell, 1976, 293–313; Trinkaus and Howells, 1979).

The fossils from Ngandong on the Solo River in Java were first described as having characteristics that related them to Neanderthalers and as being of comparable age (von Koenigswald, 1958). More recent assessments, however, suggest that they are appreciably older than the early Upper Pleistocene and more closely related, morphologically and chronologically, to the earlier hominid *Homo erectus* (Jacob, 1976). From China also come fossils which are contemporary and share anatomical traits with both the classic Neanderthalers of Europe and with Modern Man (Howells, 1977; Lanpo, 1980, 37–60; Wu Xinzhi, 1981). Taken as a whole, therefore, this evidence clearly shows, in each of

the cases, an *in situ* evolutionary development, so to speak, of the early Upper Pleistocene hominids from the older, archaic *Homo erectus* stock via an early *Homo sapiens* grade, so that there is probably general agreement among anthropologists that the various regional populations of the early Upper Pleistocene derived a large part of their genetic composition from the ancestral indigenous populations (Howells, 1980). In Europe, however, while the Neanderthal populations appear to have evolved relatively gradually from the pre-existing regional stock, their final disappearance was sufficiently sudden to suggest that an autochthonous transition from Neanderthal to Modern Man need not necessarily have taken place there.

With the possible exception of Europe, therefore, it would seem that a transition from the Neanderthal grade to Modern Man undoubtedly did take place, though there are still those who adhere to the hypothesis that an as yet undetected stock, derived from the original tool-maker *Homo habilis*, was the progenitor.

The Neanderthal Hypothesis (Fig. 1)

Part of the disinclination to accept Neanderthalers as immediate ancestors of Modern Man derives from the old misconception that they were subhuman, brutish, and bad: a repelling, crude, and shambling ape-man that could never have given rise to ourselves (Boule, 1911–13). Such a view—based on a series of preconceptions, false hypotheses, incorrect reconstructions, and inaccurate measurements—has now disappeared though there is still a

Fig. 1. Map of Europe, west and central Asia to show the distribution of Neanderthalers and location of sites with hominid fossils referred to in the text. (After Trinkaus and Howells, 1979.)

reluctance on the part of some anthropologists and prehistorians to accept the evidence that—the classic European Neanderthals apart—these fossils (of which more than one hundred now exist) represent a gene pool that, by 50,000 years ago, was capable of producing a range of individuals, some classically Neanderthal and others showing characteristics that link them with Modern Man. Indeed the ranges of variation of Neanderthal and Modern Man overlap (Campbell, 1976, 307).

As we have said, another way of interpreting these 'progressive' fossils is that they are hybrids between Neanderthalers and a contemporary and, as yet, unidentified modern population. That such a population *may* have existed cannot be totally excluded because of the vast areas of the Old World that still remain to be investigated. The Pleistocene populations of the Indian peninsula, for example, are quite unknown and large parts of south-east Asia and the Far East remain to be explored. But, with the increase in investigations in the Middle East, Russia, eastern Europe, and northern and southern Africa, the existence there of such a population now appears less likely and the 'prae-*sapiens*' hypothesis, once favoured on the basis of the cranial evidence from European Middle Pleistocene fossils, must fall away since the new fossils from Petralona and Arago show that they belong, morphologically and chronologically, midway between *Homo erectus* and the Neanderthalers (Stringer, 1981). If, therefore, there is now less likelihood of finding an isolated modern stock that, suddenly some 35,000 to 40,000 years ago, manifested itself by a rapid expansion that successfully eliminated all Neanderthalers, then the Skhul and Qafzeh fossils from Israel must be seen as representing a population in which the genetic changes leading to Modern Man were already well under way (McCown and Keith, 1939; Campbell, 1976, 302-3, 311).

This seems to me the more acceptable explanation though the circumstances leading to this transformation still remain to be identified, as well as the ways in which it was effected. Which, for example, of the two models that have been postulated is the more probable?—that these genetic mutations were sufficiently complex to have taken place only once in some, as yet, unidentified region from where Modern Man spread throughout the world? or, alternatively, that he evolved in each of several regions of Eurasia and Africa from the autochthonous hominid populations derived ultimately from *Homo erectus*? Some say the first of these models seems the more likely for genetic reasons. However, a third model might also be possible, namely that, although the changes

were effected in only one region among a relatively isolated population, they were of sufficient significance for mankind that the population explosion they initiated resulted in very wide dispersal of the new stock which, through hybridization with some of the older indigenous populations with which they came into contact, ensured some genetic continuity with what went before and provided a gene pool that contributed to later behavioural specialization and so gave us the racial differences in the present-day world populations.

Each of these models will be viewed in the light of the cultural evidence described below but, before doing so, it is necessary to look at the main reasons for advocating a Neanderthal ancestry for Modern Man. First, they have many anatomical character-istics in common though, clearly, there are important differences, especially in the head and face and in the general robustness and muscularity of the Neanderthalers. However, for the present thesis, the shared characteristics outweigh the dissimilarities. Secondly, populations with the Neanderthal grade of character-istics are very widespread, stretching from China to southern Spain, from northern Europe and central Asia to South Africa and south-east Asia. Thirdly, there is considerable variability both among these populations as a whole and between individuals of a single population. The Middle Eastern Neanderthalers and some of the African fossils are closer to early modern repre-sentatives than is the classic European Neanderthal population with which, until recently, they have always been compared (Trinkaus and Howells, 1979). Fourthly, they appear to have been sufficiently well adapted, socially and economically, to be able successfully to occupy a broad range of ecological niches. They were competent foragers and efficient hunters of large game, organized to a transhumant pattern of occupation of base camps, sometimes in caves, and more temporary dwellings in the open. Their technical understanding and varied tool-kits permitted them to perform efficiently a number of different tasks and to exploit a very diverse range of resources from the tundra to the tropics. They were clearly capable of some abstract reasoning (Bergounioux, 1958) which can only have been possible by means of a relatively efficient communication system (Lieberman and Crelin, 1971; Campbell, 1976, 345-6). This is manifest in the number of deliberate burials of both adults and children. Food for the dead was included (cf. the pig bones at Skhul (McCown and Keith, 1939) or the goat at Teshik Tash (Movius, 1953)) and there were other grave goods, notably the 'flowers' with the burial

at Shanidar (Solecki, 1971, 246–50). The more esoteric ritual represented by the Monte Circeo skull in its circle of stones (Blanc, 1958) and the use of pigment seen at a number of sites (Campbell, 1976, 347–8; Clark, 1982, 337–8) suggest some basic ceremonial practices and magical beliefs while the care extended to living handicapped members of the group, as seen in the arthritic old man of La Chapelle-aux-Saintes (Campbell, 1976, 306) and the man with the withered arm at Shanidar (Solecki, 1971, 212, 195–6; Trinkaus and Zimmerman, 1982) bespeaks a social responsibility little different from our own.

Notwithstanding the above similarities with ourselves, it is clear that Neanderthal and Neanderthal-related populations were less efficient, biologically and culturally, and were more limited as to what they *could* do—and wanted to do—with their technical equipment. It is claimed that one important advantage possessed by the early representatives of Modern Man in many regions was the standardization of the primary form from which the stone tools were made. That is, they were able to produce blades which greatly facilitated the manufacture of a wide range of retouched pieces that could be mounted in traditional ways as the working parts of tools and weapons. At the same time, other materials began to be much more widely used.

Although bone, antler, and ivory had been worked into simple tools in earlier times, there is nothing older that compares with the efficient Upper Palaeolithic bone and antler equipment. This is also true for the unique Upper Palaeolithic cave and home art, though the first crude attempts at engraving do occur somewhat earlier (de Sonneville-Bordes, 1974).

Upper Palaeolithic in Europe

The first fossil evidence of Modern Man from sites in Europe occurs in association with the early Upper Palaeolithic blade traditions of which there are two major divisions. One is the Chatelperronian which Bordes has shown (1972b) is probably derived from the Mousterian of Acheulian tradition but which others see as intrusive with a possible origin in south-west Asia. The other is the Aurignacian which *could* have evolved somewhere in eastern Europe. Because of this association it has come to be assumed that Modern Man and the Upper Palaeolithic are indivisible. In addition, because the break between the older industries and the early Upper Palaeolithic was considered an abrupt one, it was assumed that the makers of the Upper Palaeo-

lithic blade tools were all moderns whereas the makers of the
earlier industries—generally known as Mousterian—were all
Neanderthalers. However, artefacts (cultural evidence) associ-
ated with early hominids cannot, of themselves, be used as an
indicator of what kind of men made them and the morphology of
artefacts is always an extremely poor indicator of the complexity
of the behaviour of their makers. Moreover, ethnographic evidence
shows that it is the nature of the working edges of tools alone that is
significant (e.g. Hayden, 1977). It is not the actual tools that are
important, therefore, but what their makers *did* with them.

Stringer's multi-variate metrical analysis (1974) of later Pleisto-
cene crania also strongly suggests that, in Europe, the late classic
Neanderthalers were not ancestral to the early Upper Palaeolithic
modern population since they resemble them even less than do the
earlier Neanderthalers. Possible support for this view is provided
by the recent discovery in a cave at Saint-Césaire in western
France, of a classic Neanderthal skeleton that is as young as or
younger than 34,000 BP. However, the associated industry is not
Mousterian but early Upper Palaeolithic (Chatelperronian)
(Lévêque and Vandermeersch, 1980; ApSimon, 1980) confirming
Bordes's (1972*b*) hypothesis that the Chatelperronian is evolved
from the Mousterian of Acheulian tradition. However, if the
modern Combe Capelle fossil also belongs with the Chatelperron-
ian as is claimed (though there is some doubt), this does present a
problem. At the same time Aurignacian assemblages and modern
human remains are as old as 30,000 years and Aurignacian and
Chatelperronian are sometimes found interstratified, so that it is
possible that Neanderthal and *Homo sapiens sapiens* may have existed
contemporaneously for a time in south-west France. Additional
support, though needing confirmation, comes from another
Neanderthal fossil from West Germany (Hohnöfersand) dated to
about 36,000 BP which also shows some modern features (Bräuer,
1981) and from the earlier existence of the Aurignacian in eastern
Europe—namely, from the Bacho Kiro cave in Bulgaria where it
appears to date to as early as 43,000 BP and is claimed to be asso-
ciated with fossil remains of anatomically modern appearance
(ApSimon, 1980; Wolpoff, 1981, and reply by ApSimon). It is
unlikely that this question of overlap between Neanderthaler and
Modern Man, of transition from Mousterian to the Chatelperron-
ian and contemporaneity of Mousterian, Chatelperronian, and
Aurignacian, will be resolved until considerably closer and more
refined dating evidence becomes available. Only then also will the
question of origins—whether *in situ* or from external migration—

become clearer. If established opinion favours an external origin for the European Upper Palaeolithic and its makers, Modern Man, the new evidence that is becoming available could require some substantial revision or redefinition of this view.

The Middle East

In the Middle East the situation is just as complex but rather different. Here we have fossil evidence of a fully modern population associated with a Mousterian industry at Qafzeh cave in Israel (Vandermeersch, 1977). There is a very similar situation at Skhul (Mount Carmel) where the modern form is associated with Neanderthalers and, again, with a Mousterian (McCown and Keith, 1939). On the other hand, at Wadi Amud, a Neanderthal is associated with an industry considered transitional between the Middle and Upper Palaeolithic (Watanabe, 1970). These anatomically modern forms are believed to be older (40,000–50,000 BP) than the classic Neanderthalers of Europe and recent uranium series dates for Skhul cave suggest ages between 80,000 and 350,000 BP (Bar-Yosef and Goren, 1981). There is also evidence from this region of an early Upper Pleistocene blade tradition older by some 12,000–15,000 years than the Levantine Aurignacian. This evidence comes from the Negev where Marks's investigations have shown the Mousterian industries there to contain blade elements that resemble and anticipate the Upper Palaeolithic (Marks, 1977) and this is the same also in Lebanon (Copeland, 1975, 337-9). The first true blade industry immediately post-dating the Mousterian is more than 45,000 years old in the Negev (Boker Tachtit) and comprises 55 per cent of blades (Fig. 2). The tradition can be seen to continue here (Boker A) down to 27,000 years ago and its earlier stages have been correlated by McBurney (1977, 26-30) with the earliest Upper Palaeolithic at Ksar Akil (Layer 25) in Lebanon of which the estimated age is 43,000 BP. The same industry occurs at Abu Halka, also in northern Lebanon, and McBurney has gone on to demonstrate the close relationship also with the Dabban industry from Cyrenaica which, he convincingly argued, was intrusive from the Levant as well as being some 3,000 years more recent, making its first appearance around 40,000 years ago.

   This early Upper Palaeolithic tradition appears appreciably earlier in the Levant than does the Aurignacian which, though inadequately dated there to around 32,000 BP, is unquestionably stratigraphically younger at Ksar Akil. In the Upper Palaeolithic
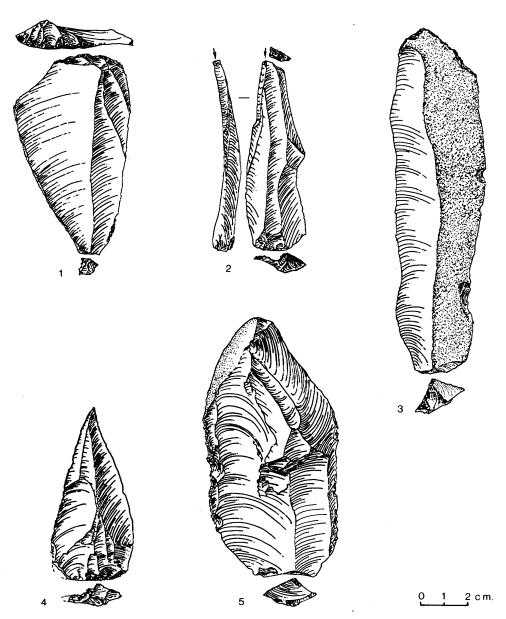
FIG. 2. Early Upper Palaeolithic tools from Level 4 at Boker Tachtit, central Negev: (1) end scraper; (2) burin on truncation; (3) distally retouched blade; (4) point; (5) modified flake. (After Marks, 1977, vol. i, pp. 69–71.)

of Iran (the Baradostian) appearing at about the same time (42,000–40,000 years ago) McBurney saw the same tradition which spread not much later to Afghanistan and thence to north central Asia and Japan (McBurney, 1975, 201–19; 1977, 30). On the other hand, the claimed antiquity of the Aurignacian in Bulgaria may be an indication of an independent development

of a second, unrelated but equally early, Upper Palaeolithic tradition originating somewhere in eastern Europe which only later spread to the Levant.

Outside Europe, the Middle East, and northern and central Asia, the fossils that are ascribed to fully Modern Man, *Homo sapiens sapiens*, are nowhere found associated with industries of Upper Palaeolithic type, though general contemporaneity is established. The Upper Palaeolithic blade, burin, and elaborate bone work industries were clearly efficient and helped to support a thriving, expanding population that was far more numerous than that of the Neanderthalers and which occupied habitats that they did not, or could not, use. However, in other regions where quite different and often simpler-looking stone tool-kits were made, anatomically modern populations also flourished, expanded, and became ecologically diversified. Thus, it would appear that the success of Late Pleistocene Modern Man was *not* specifically tied to Upper Palaeolithic technology. Perhaps it was related to more general and fundamental innovations such as improved language capabilities and strengthened social organization.

Africa (Fig. 3)

In north-west Africa, two cave sites in coastal Morocco have now yielded human remains in association with Aterian industries (Débenath, 1975; Roche and Texier, 1976) (Fig. 4). The Aterian complex is the north-west African and Saharan equivalent of the later European, north-east African, and Levantine Mousterian and carbon dates suggest that it is all older than 40,000 BP (Clark, 1982). The fossil remains (Ferembach, 1976a) from the Dar-es-Soltan and Temara (ibid. 1976b) caves have fully modern characteristics and are clearly different from and younger than the Neanderthalers from Jebel Irhoud, with a Mousterian industry (Howell, 1982, 137–40). However, the Aterian, whose makers were credited with the invention of the tang as an adjunct to efficient hafting of stone working-parts, shows quite clearly its close affiliation with the Mousterian.

Moving to the Sudan in north-east Africa, the Singa cranium is that of another early modern hominid considered to belong in the early Upper Pleistocene where it is contemporary with a Middle Stone Age flake and chopper industry (Wells, 1951; Lacaille, 1951).

In eastern Ethiopia from the Porc-Epic cave, the Dire Dawa mandible fragment for which both Neanderthaloid and Modern
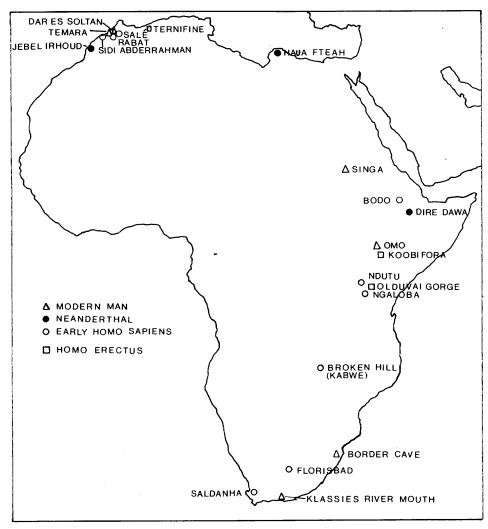
FIG. 3. Map of Africa to show location of sites with hominid fossils referred to in the text.

characteristics have been claimed (Vallois, 1951) has now been shown to be associated with a Middle Stone Age (Levallois and disc core) technology with points and side scrapers and is more than 32,000 years old (Clark and Williams, 1978). From the lower Omo valley in south-west Ethiopia come fossils with a date of around 120,000 years BP that exhibit an association of more archaic features (Omo II) with those of fully Modern Man (Omo I) (Day, 1972) and other fossils (Guombe in east Turkana and Kanjera (Oakley *et al.* 1977, 60)) contribute to the broad degree of variability which is comparable to that seen in the Middle East and early Upper Pleistocene hominids.

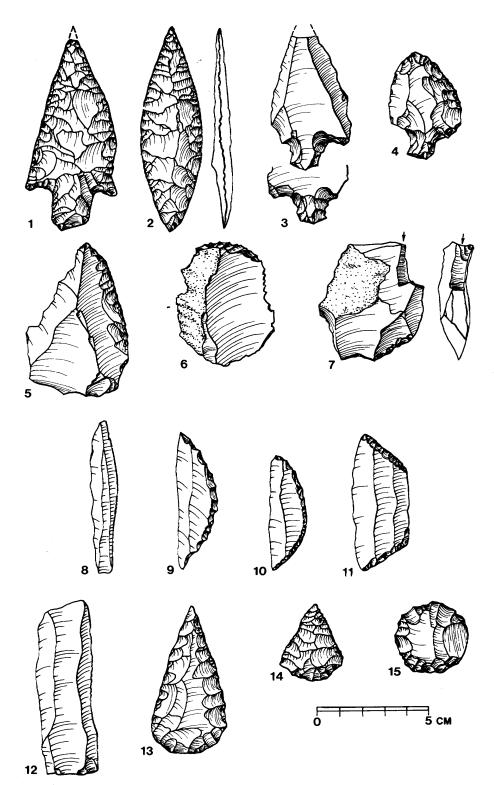The nearly complete Ngaloba skull recently reported from

FIG. 4. *Nos. 1–7.* Aterian artefacts from sites in north-west Africa and the Sahara:
(1) pointe marocaine; (2) point; (3) tanged flake; (4) tanged scraper; (5) side scraper;
(6) end scraper; (7) burin. *Nos. 8–11.* Howieson's Poort (Epi-Pietersburg) and *nos. 12–15.*
Pietersburg artefacts from Border Cave, South Africa: (8, 12) blades; (9, 10) large
lunates; (11) trapeze; (13, 14) points; (15) scraper. (Nos. 1–7 after Clark, 1982, p. 263;
nos. 8–15 after Beaumont *et al.* 1978, p. 411.)

Laetoli, northern Tanzania (Day *et al.* 1980) is also, though robust, fully sapient. With it is a Middle Stone Age industry and Middle to early Upper Pleistocene fauna. It is associated with a volcanic tuff that also occurs at Olduvai Gorge where it is dated to 120,000 BP and where Middle Stone Age tools are again present.

The Middle Stone Age in East Africa and Ethiopia most probably begins *c.*200,000 years ago (Wendorf *et al.* 1975; Clark, 1982, 274-85) and it had most likely disappeared by 35,000 years ago while the earliest blade industries—the equivalent of the Upper Palaeolithic—are dated in the Galla Lakes region of Ethiopia to more than 27,000 years ago (Street, 1980).

In South Africa, three fossil assemblages are significant in the present context and are relatively firmly dated to the end of the Middle or the beginning of the Upper Pleistocene. The partial cranium from Florisbad in the Orange Free State probably belongs with an early Middle Stone Age industry and is now thought—on multivariate analysis—to be intermediate between the older archaic *Homo sapiens* stock (represented by Broken Hill, Saldanha, and other fossils) and modern humans (Howells, 1980, 9-11). In age it is more comparable to the early Neanderthalers of Europe (Saccopastore, Biache, and La Chaise) but may well be even older (Rightmire, 1978).

In the Klasies River Mouth complex of caves on the south coast of South Africa, human remains have been recovered from occupation layers containing the earliest Middle Stone Age assemblages resting immediately on the Last Interglacial raised beach (about 120,000 years old) from which the sea had just begun to retreat. These are fragmentary fossils but are reported as almost all anatomically modern (Rightmire, 1976). The stone industry with which they are associated is typologically early Middle Stone Age (Middle Palaeolithic), a tradition which continues, except for one abrupt break in artefact technology, for some 50,000 years. The break in question is dated between about 80,000 and 90,000 years ago and consists of an industry (Howieson's Poort Complex) made on blades with retouched tools that include backed blades, large lunates and trapezes, and various scraper forms. While blade technology dominates, artefacts in the Middle Stone Age flake-blade tradition are also present (Deacon, 1979, 87-102). There are a number of other sites in South Africa, in Lesotho (Carter and Vogel, 1974), and in Zimbabwe also (Cooke, 1971) where blade technology appears at this early time only to disappear and not reappear again until some 35,000 years later at around 25,000-20,000 years ago with the first Later Stone Age industries.

Even more significant than the Klasies River Mouth fossils are the discoveries in the Border Cave (Ingwavuma) on the edge of the escarpment in south-east Africa near the border between Natal and Swaziland (Beaumont *et al.* 1978). Here the artefacts from the lower levels are all older than 35,000 BP and belong in the Middle Stone Age tradition with again a layer containing the Howieson's Poort blade complex that divides the Middle Stone Age proper into earlier and later stages (Fig. 4). The main occupation levels span four lengthy periods of frost-weathering and, on extrapolation and correlation with the stratigraphy at Klasies River Mouth and other South African cave sequences, and oxygen isotope stages, there is reason to believe that the cave was first occupied by Middle Stone Age man at a time before the Last Interglacial (Butzer *et al.* 1978) about 195,000 years ago.

The human remains comprise a partial adult cranium, mandible, and post-cranial fragments found by a farmer digging for guano. An infant burial was excavated from a shallow grave in the top of the earlier Middle Stone Age (Pietersburg) layers just below the Howieson's Poort blade complex level and a second adult mandible comes from that level itself. The inferred age of this blade tradition level is about 90,000–95,000 BP (Butzer, 1979, comment on Rightmire) so that, if this estimate is correct, some of the fossils may be even older.

While some doubt may exist as to the level from which the specimens found by the farmer came—though it is claimed that sediment in the interior of the cranium is the same as that from the layer in which the infant burial was found—the latter and the second adult mandible appear to be dated securely in the Middle Stone Age. All these hominid fossils are anatomically modern without a trace of 'archaic' features and can be regarded as 'an already partially differentiated basal stock from which the Khoisan peoples, amongst others, ultimately arose' (Beaumont *et al.* 1978; Rightmire, 1979).

Summarizing, the fossil evidence from Africa indicates the early differentiation south of the Sahara of an 'archaic' early *sapiens* stock (represented by Broken Hill and other fossils) which appears first with the assemblages of Acheulian bifaces during the later Middle Pleistocene. By the beginning of the Upper Pleistocene an early modern population had evolved from them, represented by Singa, Omo, Klasies River Mouth, Border Cave, and other eastern and southern African fossils (Rightmire, 1981; Bräuer, 1978); they were making tools in the Middle Stone Age flake and blade tradition. In north-west Africa, individuals of fully modern

appearance were also present well before 35,000 years ago.
Possibly evolved from the Jebel Irhoud Neanderthal stock, they
are the ancestors of the late Pleistocene populations there and
were the makers of the Aterian Industrial Complex. If the dating
is correct, these fossils are both older than and contemporary with
the classic Neanderthalers of Europe and the modified popula-
tions of the Middle East.

The early blade industries—the Howieson's Poort in southern
Africa (Deacon, 1979) and the pre-Aurignacian in Cyrenaica
(McBurney, 1967, 75–104) and the Amudian in the Levant
(Garrod and Kirkbride, 1961), both of the latter being strati-
graphically older than the Mousterian—remain difficult to ex-
plain. However, they show clearly that some very widely dispersed
populations were, by the beginning of the Upper Pleistocene,
capable of devising and manufacturing blade-dominated indus-
tries with their potential for standardized preforms for a multi-
plicity of tool types. Whatever the technique used to make them
—whether punch or direct percussion—if blades were so much
superior, as has been claimed for the Upper Palaeolithic, why did
not this tradition continue instead of giving way to the Mousterian
flake tradition? There is, as yet, no convincing explanation
supported by factual data. The reason does not appear to be eco-
logical but one possibility that needs investigating is that, at this
time, stone tools were still hand held and it was only later, during
the Middle Palaeolithic, that efficient hafting techniques were
developed. In such circumstances, much of the superiority of a
standard blade preform might not have been so apparent and its
abandonment would be more readily understandable when con-
ditions dictated the advantage of the Mousterian flake tradition.
No hominid fossils have been found with the pre-Aurignacian and
Amudian in the eastern Mediterranean but the southern and
eastern African fossils, as also those from the Moroccan coastal
caves, show that populations within one end of the range of
variability resembling modern humans were broadly dispersed in
the continent well before 40,000 years ago and that they were the
makers of tool-kits in both the prepared flake and blade manu-
facturing traditions.

Southern Asia (Fig. 5)

It is a matter for considerable regret that no hominid fossils have
been recovered from the Indian peninsula that are more than
10,000 years old. They must, however, be present there when one

takes into account the *Homo erectus* fossils from Java (Sangiran, Trinil, Sambungmachan) and China (Choukoutien, Lantien) and their discovery is certainly overdue. At present still, as Sir Mortimer Wheeler said twenty-two years ago, Pleistocene man's 'solitary memorial (there) is an infinitude of stones' (Wheeler, 1959, 34). The Middle Palaeolithic of India is probably no younger than 35,000 years and, in its later stages, shows a tendency to produce long blades with faceted platforms, as in the Levant.
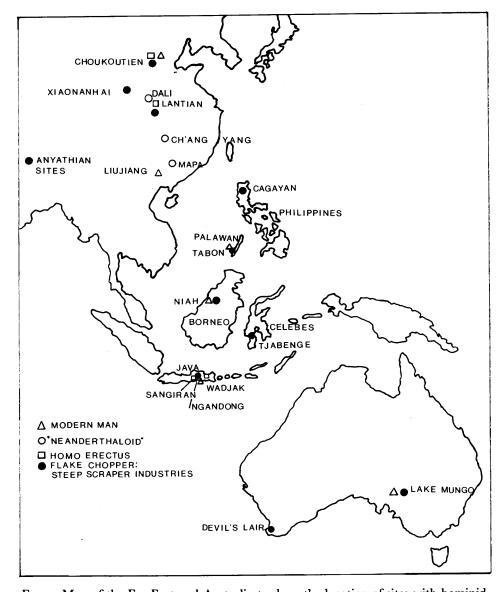

FIG. 5. Map of the Far East and Australia to show the location of sites with hominid fossils and early Upper Pleistocene artefact assemblages referred to in the text.

The earliest true blade industries there have dates showing them
to be between 30,000 and 20,000 years old (Sali, 1974; Sharma *et
al.* 1980; Murty, 1979), though a probably older industry from
Renigunta (Murty, 1968) in south-east India, may be the
equivalent of the South African Howieson's Poort Complex. In
their final form, at the close of the Pleistocene, the small blade
assemblages have resemblances to the Zarzian of Iraq and Iran
(Sharma and Clark, 1982, 268-9). Their ancestry, therefore, may
be linked with the early Upper Pleistocene blade tradition
(antedating the Aurignacian) in the Levant. In the light of the
Wadjak fossils from Java (Day, 1977, 310-12), that from Niah
in Borneo, and the Australian fossils, we can expect to find
anatomically Modern Man in India at least in a 40,000-year-old
context.

    The Wadjak fossils are fully modern and, though undated, they
are likely to be earlier rather than later in the Upper Pleistocene.
The juvenile from the great cave at Niah in Sarawak is also
modern with no trace of more archaic traits (Brothwell, 1960). It
is associated with artefacts and an early radiocarbon date of
40,000 BP. In view of the inferred correlation of Modern Man and
Upper Palaeolithic blade industries, it is further significant that
the artefacts associated with the Niah fossil, with those from the
Tabon Cave on Palawan in the Phillipines (Fox, 1978) and those
from Lake Mungo in Australia, bear no relationship at all to what
we know as the Upper Palaeolithic (Fig. 6). The Niah artefacts are
choppers and large flake tools with some worked bone (Harrisson,
1978; Shutler and Shutler, 1975, 20-2). They are comparable to
other early upper Pleistocene chopper and flake assemblages from
Tabon Cave and Cagayan in the Phillipines; Tjabenge in Celebes
and Ngandong and Sangiran in Java as well as the Anyathian sites
in Burma so that this tradition is clearly long established and very
widespread in Indonesia.

Australia

Especially significant is the evidence now available for the first
peopling of Australia. The three fossils now recovered from Lake
Mungo belong to a horizon dated to more than 32,000 BP. They
are associated with hearths and stone artefacts showing that they
were burials, incidentally the oldest-known cremations, relating
to temporary camp sites close to one of the many freshwater lakes
existing in the interior of the continent at that time (Bowler *et al.*
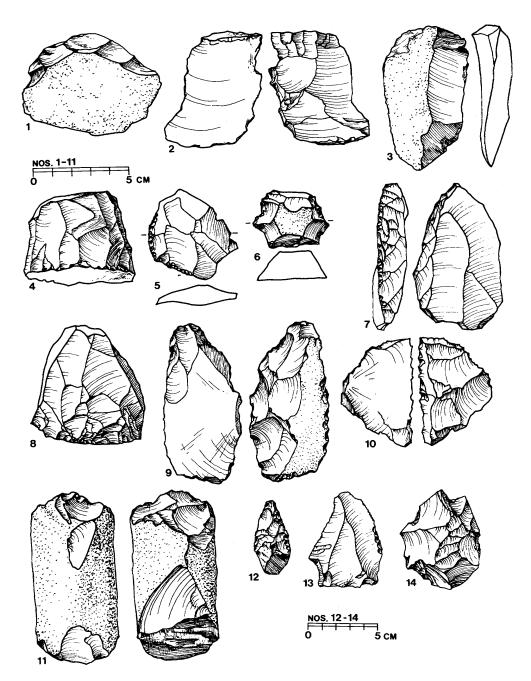1970). The most recent excavations have shown that artefacts are

FIG. 6. *Nos. 1-4.* Flakes (1-3) and core scraper (4) of the south-east Asian Tabonian tradition. (Nos. 1-3 from Niah Cave, Sarawak and no. 4 from Tabon Cave, Palawan.) *Nos. 5-8.* Scrapers (5-7) and horsehoof core (8) of the core tool and scraper tradition from the Lake Mungo cremation site, Australia. *Nos. 9-14.* Flake tools and chopper from Locality 15, Choukoutien, northern China: (9-11) flake scrapers; (12) small core chopper; (13) point; (14) flake. (Nos. 1-3 after Shutler and Shutler, 1975; no. 4 after Fox, 1978; nos. 5-8 after Mulvaney, 1975; nos. 9-14 after Movius, 1949.)

present in the deposits up to 1.5 m below the horizon with the burials (Shawcross, 1957). Devil's Lair, Western Australia, is another such later Pleistocene occupation site (Dortch and Merrilees, 1973). There can, therefore, now be no doubt that the interior desert parts of Australia had been populated by man at least 40,000 years ago, probably considerably earlier. Moreover, these fossils show no trace of archaic *Homo erectus* characteristics but are ancestral to the present-day Australian aborigines (Shawcross and Kaye, 1980). The Australian artefacts comprise—to use the Australian terminology—horsehoof cores, steep edged scrapers, and flat scrapers belonging to what is termed the 'Australian core tool and scraper tradition' (Bowler *et al.* 1970, 50; Mulvaney, 1975, 172-80).

China

The evidence for the first appearance of Modern Man in mainland China is much less well dated. The recently discovered cranium from Dali (Wu Xinzhi, 1981; Howells, 1980, 7-8), associated with a late Middle Pleistocene fauna, is an example of an early *Homo sapiens* grade with characteristics intermediate between *Homo erectus* and Modern Man; so that, here again as in Europe and Africa in this time range, the 'phyletic gradualism' model is applicable. Dali man is associated with a scraper industry in flint and quartzite. The Neanderthal-like Mapa (Maba) skull and the maxillary fragment from Ch'ang-yang are not associated with artefacts but the fauna belongs in the late Middle or early late Pleistocene (Lanpo, 1980; *Atlas of Primitive Man in China*, 1980, 86-90; Aigner, 1978a, 142-3). However, other sites with the same fauna (Localities 15 and 22 at Choukoutien (*Atlas*, 1980, 61-5, 69), Xindong Cave (*Atlas*, 1980, 66-8), Gezidong Cave (*Atlas*, 1980, 82-5, for example) have all produced numerous artefacts in the flake and chopper tradition (Fig. 6, 9-14; Fig. 7). Some of the flake tools are not unlike those found with some of the African Middle Stone Age industries. Later are the Liujiang (*Atlas*, 1980, 139-42), Ziyang (*Atlas*, 1980, 147-8), and Upper Cave, Choukoutien (*Atlas*, 1980, 110-19) fossils, all are representative of early Mongoloids. Although the associated artefacts tend to be smaller, these still unquestionably belong in the flake and chopper tradition (e.g. Xiaonanhai—Hsiao-han-hai), though well-shaped bone tools also now occur (Aigner, 1978a and b; Freeman, 1977).
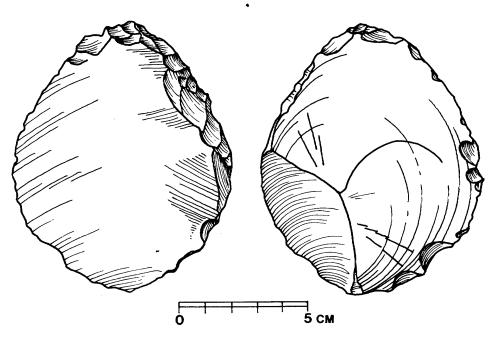
FIG. 7. Large retouched flake chopper from Locality 15, Choukoutien.
(After Movius, 1949.)

Conclusions

One undeniable conclusion to be drawn from this review is that
the available chronology (Fig. 8) suggests that fossils which are
anatomically modern appear earlier in south-east Asia where they
are associated with a flake and core culture, and in Africa where
the association is with the Middle Stone Age, than they do in
Europe or northern Asia where the cultural tradition is that of
the Upper Palaeolithic. Obviously, therefore, it is particularly
dangerous to assume that Modern Man is synonymous with
Upper Palaeolithic tools since, in large parts of the Old World,
the Upper Palaeolithic does not occur though Modern Man was
there by the early Upper Pleistocene. This is not to say that in the
regions where the Upper Palaeolithic is found such a connection is
not valid: of course it is. Though even here considerable caution
should be exercised in equating genotype and culture over the
time of transition.

   In every instance in the respective continents, the hominid
fossils that date to the time of the late Middle Pleistocene (some
300,000 to 100,000 years ago) and the early Upper Pleistocene
(about 100,000 to 40,000 years ago) show features intermediate
between the older *Homo erectus* stock and the Neanderthal and

modern grades of evolution, thus demonstrating that a gradual-
istic model for hominid evolution in more than one region is not
inconsistent. The cultural evidence is, moreover, in accord with
this in that the early *Homo sapiens sapiens* fossils are associated with
markedly different technological traditions in Europe, Asia, and
Africa.

The evidence presented in this review, however, might be
interpreted in other ways and the one which is closest to the truth
will only be determined after very much more precise dating
evidence becomes available. We need to be able to place a fossil or
an artefact assemblage accurately within a thousand, rather than
ten thousand, years, so rapidly does it appear that both biological
and cultural transformation came about. Besides refinement in
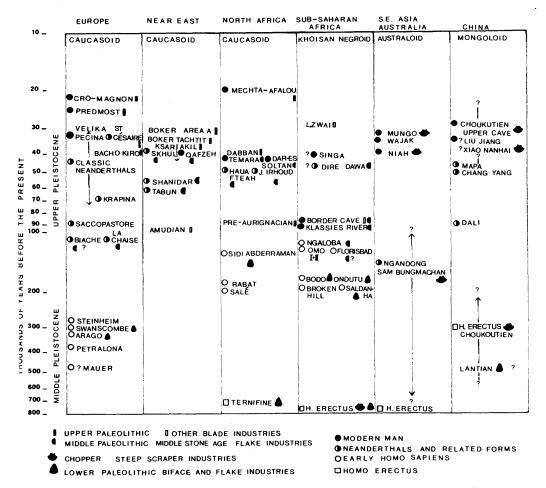conventional radiocarbon dating and the need to be able to

FIG. 8. Chart to show the temporal relationships of hominid fossils and artefact traditions
referred to in the text.

extend the possibility of obtaining finite results back at least 100,000 years, it is necessary to date the fossils themselves *directly*. This is now possible since only a minute amount of material is needed to obtain a date. Until these improvements are realized there is little chance of obtaining the conclusive chronological evidence that will help in deciding between the 'phyletic' or the 'replacement' models (Cronin *et al.* 1981; Trinkaus and Howells, 1979; Sarich, 1971).

If—and I believe the evidence for this cannot be disputed—Modern Man evolved within the 'Neanderthal evolutionary grade' by a 'phyletic gradualism' then it was not so much the actual artefacts of his technology as the conception and manner of their use deriving from intellectual superiority made manifest through a full communication system that was responsible for the population explosion that took place some 40,000 years ago. Improved nutritional standards resulting from the new hunting and gathering strategies, increased protein intake, and a more sustained diet, favoured the spread of the genotype by shorter spacings between births and larger band size, so necessitating expanded and more intensive use of the land and its resources. Was it therefore, culture—*language* and technology—that was the catalyst behind Modern Man's dispersal? I suspect it was. At the Palaeolithic level populations must still have been sufficiently sparse, however, to have cushioned competition as there was generally somewhere to move to. Where 'empty areas' were available population spread was particularly rapid thereby lending support to the 'punctuated equilibrium' or replacement model. Such was the case in the Congo basin after the recession of the forests with the onset of the Last Glacial (Clark, 1980, 45). Or again, in the populating of the Americas where groups of hunters crossed the Bering Strait at least 14,000 years ago and, by 9,500 years ago, had reached the tip of South America some 14,000 km away (Haynes, 1969). The open nature of the continually changing group composition in hunting and gathering societies can be expected to have set up a chain reaction very advantageous to dispersal of genes and technological skill. This is likely to have led, if the 'replacement' model has validity, to hybridization with pre-existing populations so that, by social selection, the more archaic genotypes were eliminated. A similar diffusion of genes and cultural technology is to be seen in the much later spread of food production into Europe from the Near East (Ammerman and Cavalli-Sforza, 1971), by way of the 'bow wave' which left also in its wake pockets of older peoples and technology that changed

more slowly in less favourable habitats. Another comparable example is the equally rapid spread of Iron Age/Bantu-speaking populations in sub-Saharan Africa in the first few centuries of the present era (Phillipson, 1975; Van Noten, 1982). The mechanism whereby Modern Man spread throughout the world is, therefore, not so much in question as the sequence of events whereby this came about.

In these earliest Upper Pleistocene human fossils exhibiting a blending of archaic and modern characteristics, are we witnessing a trend towards the modern form to which the full transformation took place by evolutionary gradualism in several areas of Africa, Asia, and, perhaps, Europe? or was this transition effected only once? in which case, many of these intermediate populations must have become extinct. Only better dated, more complete and culturally associated fossils can provide the answer. The replacement model might favour eastern Africa and the Middle East as a single or two separate regions of differentiation and dispersal. Here fully modern representatives make an earlier appearance and the demonstrated variability would indicate that these were areas close to the centre of speciation (Thorne, 1980). The incompleteness of the evidence does not, however, rule out southern Asia or the Far East though, taken as a whole, intermediate fossil forms and the associated industrial diversity in each region suggest that both the biological and cultural data better support a model of 'evolutionary gradualism' that might have been hastened or sometimes overlain by migration or replacement. One thing at least is clear—that one must not confuse acculturation, on the one hand, with biological change, on the other. These are separate issues and are not *necessarily* related.

If this discussion must close on a note of uncertainty as regards the fossils themselves, I hope I have shown that the search for the source of the Upper Palaeolithic may be in the nature of a red herring where it comes to looking for the *origins*, as opposed to the *later spread*, in certain parts of the world, of the modern genotype. This is one of the most intriguing problems in palaeoanthropology today and a systematic programme of interdisciplinary and international investigation of the Asian tropics is long overdue. This is probably the most pressing need in this field and is certain to bring exciting and decisive new discoveries and rewards that will enable us to re-evaluate the existing data. When such a programme has got under way, when investigation in Africa is intensified and the chronologies have been improved, then we can expect that the uncertainties prevailing today will be considerably

reduced. Our interpretative models will be narrowed down and the 'new men, strange faces, other minds' that the record reveals and that Sir Bedivere was so worried about, will assume their true significance and relationship and the sequence of events whereby 'the old order changeth yielding place to new' (Tennyson: 'Morte d'Arthur') will in time be much better understood.

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