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OLD QUESTIONS: NEW ANSWERS? SOME THOUGHTS ON THE ORIGIN AND ANTIQUITY OF MAN IN AUSTRALIA*

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But howe the people furst began
In that contrey, or when they cam,
For clerkes it is to questyon.¹

How long have the Aborigines been in Australia? Where did they come from? How did they come? To whom are they related? How and why are they different from other races of man? These questions have been posed by Europeans since they first came to Australia, and thanks to recent research some answers are beginning to appear.

In 1898 A.W. Howitt reviewed the arguments which had been put forward to that time for the origin of the Aborigines of Australia and Tasmania.² With his usual acumen Howitt dismissed a number of theories before focusing attention on the evidence which he thought important to the problem. On one point Howitt was adamant: the questions relating to the origin of man in Australia were far too complex to be the prerogative of a single discipline.³ Time has proved Howitt right: the advances of recent years in our knowledge of the origin and antiquity of man in Australia have been the result of multidisciplinary ventures.

It is the aim of this paper to review some recent contributions to the questions concerning the origin and antiquity of man in Australia. In particular it will examine two recent volumes, one concerned primarily with physical anthropology⁴ and the other with prehistory,⁵ which contain papers directly or indirectly related to these questions. The account is not intended to be yet another summary of recent archaeological research,⁶ but a critical re-examination of ideas related to a specific theme. The issues involved are complex; the work of scholars of different disciplines is involved, the language they write in is often technical and their works are not easily accessible to the layman. It is hoped that this paper will not only provide a synopsis of recent thought but also provide some new insights to the current debate.

How long has man been in Australia?

In 1898 Howitt boldly asserted that man had been in Australia for a very long period:

In considering all the facts before me bearing upon the question of the origin of the Tasmanians and the Australians, I have been much impressed by the immense periods of time which seem to be essential as one of the elements of any solution of the problem.⁷

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¹ John Rastell, *The interlude of the four elements* (c.1520), quoted in Huddleston 1967:8.

² Howitt 1898 reprinted with alterations in Howitt 1904.

³ Although the history of theories relating to the origin and antiquity of man in Australia are of great interest to historians, they will not be dealt with in this paper; for a provisional statement see Mulvaney 1966.

⁴ Kirk and Thorne 1976; the first four papers in this volume deal with the Pleistocene background to man in Australia and adjacent regions, the remaining contributions with aspects of physical anthropology.

⁵ Allen, Golson and Jones 1977; the papers deal not only with Australian but also with aspects of Melanesian and Southeast Asian prehistory.

⁶ Jones 1973; Lampert 1975; for an excellent account of Australian prehistory see Mulvaney 1975.

⁷ Howitt 1898:745:746.

Howitt based his opinions mainly upon geological evidence, particularly upon archaeological finds whose stratigraphy indicated some antiquity (even though many of the finds have since proved false) and upon the fact that the Tasmanians, lacking adequate water transport, must have crossed the Bass Strait when it was still connected to the Australian mainland during a period of lower sea level. Howitt lacked the means to date precisely the archaeological sites or to calculate exactly when the sea levels were lower than at present, but he reasoned that a very long period of time was involved.

Today scientists have discovered not only ways to date archaeological deposits but they have also established a chronology for past changes in sea level. Howitt's assertions of great antiquity have been confirmed, but only in recent years. Until 1961 the oldest reliable date for an archaeological deposit in Australia was that from Cape Martin in South Australia (dated at 8700 BP) but since then much older dates have been obtained.⁸ Many of these dates are older than 20,000 years and a number, all at present from south-eastern Australia (although claims have been made for such old sites in Western Australia), are over 30,000 years old. It has become commonplace in Australian prehistory to say that man has been in Australia for at least thirty to forty thousand years.

We now know that the last period of really low sea level occurred in the Australian region at about 20,000 years BP.⁹ If the archaeological dates had clustered about this period hypotheses concerning a connection between the last period of low sea level and the migration of man into Australia would have been confirmed. Instead the archaeological dates have established that man was in Australia much earlier, so we must examine the evidence for periods of very low sea level *before* 20,000 years BP. Chappell and Thom have calculated the changes in sea level for the last 240,000 years (Figure 1).

Figure 1. Changes in sea level for the last 240,000 years.¹⁰

Between the present day and 240,000 years ago the sea level has changed many times to varying degrees, but at only three periods, at 160,000, 50,000 and 20,000 years BP, has the sea fallen to extremely low levels. At these three periods of time extensive areas of land emerged from the sea. In particular two large areas of land emerged, the Sunda shelf connected to mainland Asia and the Sahul shelf to the north of continental Australia which linked Australia to New Guinea (see map). However, even at these periods of really low sea level, Australia and Asia were never connected by a continuous land bridge; between Sunda and Sahul lay many islands, separated in places by deep water channels, some up to sixty miles across.¹¹

⁸ See discussion in Jones 1977b:353-356. These dates are Carbon 14 dates; BP stands for Before Present which for C14 dates is calculated as before 1950.

⁹ Chappell 1976; Chappell and Thom 1977; as these papers indicate the question of sea level changes is immensely complex and involves a number of factors. The dates given in this paper for sea level changes are only approximate especially in regard to tectonic changes (alterations in the earth's crust due to earthquakes and volcanic activity) which are still not known exactly for the regions discussed.

¹⁰ After Chappell and Thom 1977:277, with alterations.

¹¹ See Birdsell 1977 for calculations of some of the distances involved.

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Australia, mainland and island Southeast Asia showing the Sunda and Sahul shelves and Wallacea (solid black line).

There is no real reason to assume, however, that all our calculations either of time or distance must be based upon the period when the sea fell to its lowest level. Man could have crossed from Asia through the islands and into Australia when the sea levels were as high as they are today. The lowering of sea levels merely increases the possibility of man's crossing; in fact the possibility of crossing increases proportionately to the enlargement of land and the decrease in the distances separating coasts. But this process was not the same in all areas because topographical factors must be taken into account. Where areas of land were separated by deep sea channels, large falls in sea level hardly altered the distances involved, whereas in shallow areas the decrease in distances was sometimes quite considerable. In such situations it is not just a question of how much the distances were decreased but also the rates at which the distances changed. Shallow areas may have emerged quite quickly and remained open for long periods of time. In terms of calculating a chronology for the possibility of man's entry into Australia we need to construct a $\pm$ figure on either side of the midpoint of lowest sea level fall. At a certain point in time during the fall in sea level the possibility of crossing was considerably increased and again during the rise in sea level there was a cut-off point when possibility suddenly decreased. In these terms, of the three periods of really low sea level which have occurred in the last 240,000 years, that at 160,000 years BP appears to have been the most suitable for the crossing of man into Australia. At this date the rise and fall of sea level was gradual, the period of time when the topographical conditions were most favourable for crossings was quite long (e.g. say $\pm 6,000$ years = 12,000 years) and climatic conditions were stable over a long period. In contrast the rise and fall in sea level at 50,000 years BP was quite rapid (say $\pm 2,000$ years), considerably more rapid than at 20,000 years BP (say $\pm 4,000$ years).

At present there is no evidence that man has been in Australia for 160,000 years but given the size of the continent, our limited knowledge of archaeological sites from many parts of the country and the pace of recent discoveries, there is no reason to deny such an antiquity. On the other hand if man could have crossed into Australia by whatever means and for whatever reasons at 160,000 years BP, it is highly possible that groups could also have come at later periods, particularly if technology was more developed. Birdsell has hinted at this possibility: '... there is ample evidence that the last great drop in sea level of about 20,000 years ago was not responsible for the initial populating of Greater Australia'.¹² This in turn raises other difficult and controversial problems. Was there more than one 'colonization' of Australia? If so, was more than one group involved? What is the evidence for such a hypothesis, and what are its consequences?

One group or many?

During the nineteenth century, as Europeans became aware of the extent of Aboriginal occupation across Australia, a number of scholars were struck by the similarity in physical appearance and custom of widely separated groups. At the same time a number of distinctive characteristics were also noted and various hypotheses were developed, some supporting a homogeneous view of the Aborigines, others concentrating on heterogeneous features. By the early twentieth century a number of theories were current which accounted for the differences between Aboriginal groups by reference to ancestral links with populations existing outside Australia, in India, island Southeast Asia and neighbouring Melanesia. The ancestors were sometimes named Dravidian, Malayian negritoid and Papuan, etc.¹³

¹² Birdsell 1977:110 (my emphasis); as this paper was being written it was claimed that stone tools have been discovered in a river terrace in Western Australia which is at least 100,000 years old.

¹³ For example Mathew 1910.

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During the 1930s the American physical anthropologist J.B. Birdsell began his extensive investigations (with N.B. Tindale) of Aboriginal groups in many areas of Australia. Birdsell developed a trihybrid theory to account for the variations he discovered by anthropometric measurements of physical build.¹⁴ These variations, Birdsell argued, were the result of migration by three different groups, the remnants of which had preserved their distinctive features into recent times. The oldest group, and thus the first migrants, Birdsell termed Barrineans or Oceanic Negritos whose descendants until recently inhabited Tasmania and the rainforests around Cairns in northern Queensland. These people were small in stature, dark-skinned and had curly hair. Sometime in the past the Negritos had been succeeded by the Murrayians whose descendants inhabited the Murray River basin and could also be found elsewhere in Australia. The Murrayians were of sturdy build, dark-skinned and often had extensive body hair. The third group and the most recent migrants Birdsell termed the Carpentarians. These people he traced to India, suggesting they may have been linked to modern Veddas, hunter-gatherers of southern India and Sri Lanka. The Carpentarians inhabited large areas of Australia, were tall and were particularly well adapted to the hotter climates of northern and central Australia. Though Birdsell formulated his hypothesis many years ago and much new information on the physical anthropology of the Aborigines has since emerged, he has maintained his position. Birdsell has certainly been aware of these new developments but it would seem that new discoveries can only help refine and support his trihybrid theory and he believes they provide no real challenge to his argument.¹⁵

The major opposition to Birdsell's trihybrid theory has come from another physical anthropologist with considerable experience of Australian Aborigines and who also mainly based his ideas upon anthropometric analysis of build. In a number of studies A.A. Abbie argued that over large areas of Australia the Aborigines exhibited a remarkable homogeneity in physical features. The variations which were encountered were small and could be explained as the result of adaptation (genetic and/or somatic) to diverse environments by a people derived from a single source (or gene pool). None of the variations which were apparent in existing populations were such that they need to be explained by positing separate populations derived from distinct genetical pools or separate migrations.¹⁶

Physical anthropologists using other methods to examine Aboriginal groups have neither proved nor disproved Birdsell's or Abbie's hypotheses, but they have brought Birdsell's theory into question. Genetical studies, particularly of blood groups, have revealed that at one level Aboriginal populations are extremely heterogeneous¹⁷ yet at another level Aborigines may be said to share common features which separate them from populations outside Australia. In other words, although Aboriginal groups vary within Australia there are features which set them apart as distinct from neighbouring peoples in New Guinea, Asia and Oceania. While the variations within the Australian population can be accounted for by normal variations expected to occur among groups over long periods of time and groups inhabiting different ecological conditions, the variations may also reflect inherited differences derived from separate populations. Given the antiquity of man in Australia, genetical studies cannot tell us much about how changes have occurred over very long periods: geneticists can only make significant statements about micro-evolutionary changes.¹⁸ Over very short periods of time differences within specific populations can be accounted for, but relationships between distant groups, either within Australia or with populations outside, cannot be properly explained.

¹⁴ Birdsell 1949.

¹⁵ Birdsell 1967; 1977.

¹⁶ Abbie 1968; 1976.

¹⁷ Balakrishnan, Sanghvi and Kirk 1975.

¹⁸ Parsons and White 1976.

A similar pattern has been established in other fields of study. Though Australian crania examined by detailed metrical analysis reveal variations, all the material can be grouped together to differentiate the Australian material from populations outside the region.¹⁹ One result of the analysis of the crania, however, has been to show that variations which do occur within the Australian material do not correspond to the variations outlined in Birdsell's trihybrid theory. This is particularly so of the people Birdsell described as Negritoid who inhabited the Cairns rainforest area. An examination of surviving crania from these groups show that they fall within the expected range of Australian skulls.²⁰ Tindale and Birdsell²¹ had suggested that the languages spoken by the 'Negritoid' peoples of north Queensland were different from other Aboriginal languages and this added substance to the trihybrid theory. Dixon²² has shown that although some of the languages have distinctive features they are generally similar to known Aboriginal languages and their peculiarities can easily be accounted for. Indeed linguistic analysis has taken somewhat the same position as the geneticists: local, short term variations can be accounted for but larger, long term relationships, particularly with language groups outside of Australia, are difficult to reconstruct. While Australian languages vary quite considerably they all share distinctive features which mark them as 'Australian' and therefore as different from languages outside the continent.²³

Archaeological evidence of cultural remains is difficult to interpret in terms of racial differences in population, but the analyses of stone tools from many different sites point to a fairly similar technology existing for a long period of time in Australia. There are certainly no differences which could be interpreted as three separate technologies developed over long periods by separate populations outside Australia and brought to the region with a new group of immigrants such as would support Birdsell's hypothesis.

To summarise the latest thinking,²⁴ it appears that in spite of the concerted efforts of many scholars we are no nearer understanding whether the Aborigines are a homogeneous or a heterogeneous group in origin. But many scholars prefer the idea of a single population, whether or not as the result of one migration. In fact the greater antiquity for man in Australia established by prehistorians during the 1960s and 1970s seemed to support such a view. If man had existed on the continent for such a long period there was plenty of time for groups to have become heterogeneous from a single population through natural selection and/or environmental adaptation. As such the remains of men from these early periods should have been homogeneous, variation having occurred later. But new discoveries of early man in Australia have suggested a different pattern.

A number of remains of early man have been found in Australia. The first finds were often the centre of bitter controversies as some scholars denied their antiquity or alleged they were the remains of recent Aborigines suffering from various mutations. The Talgai cranium was found in Queensland in 1886; the Cohuna and Keilor crania were found at Victorian sites in 1925 and 1940. Finally in 1960 a skeleton was found at Mossiel in western New South Wales. All the crania were large in size and robust in features.²⁵ Near the Victorian site of the Cohuna cranium, at Kow Swamp, a number of interesting skeletons of similar robust individuals have been

¹⁹ Howells 1976, 1977; Macintosh and Larnach 1976.

²⁰ Macintosh and Larnach 1976:114-115.

²¹ Tindale and Birdsell 1941.

²² Dixon 1972.

²³ T. Crowley and R.M.W. Dixon have recently reviewed the meagre evidence on the Tasmanian language (or languages). The results are inconclusive, but on the basis of present knowledge there is nothing to suggest that it was not Australian (R.M.W. Dixon *pers. comm.*).

²⁴ As related in Kirk and Thorne 1976 and elsewhere.

²⁵ See discussion in Macintosh 1963; Thorne 1971.

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excavated. A number of apparently much older remains have also been discovered at Lake Mungo in western New South Wales, at the sites associated with the oldest dates obtained from archaeological deposits in Australia.²⁶ The robust remains from Kow Swamp have been dated to about 10,000 BP, and this age appears to correspond to that of the other remains found in the locality. The age obtained for the Lake Mungo remains is much older than those from the Victorian sites, at 25-35,000 BP. These remains, however, are gracile, the crania being thin and the features delicate. The surprising thing about both sets of remains, in terms of the crania at least, is that neither have the characteristics of modern or relatively recent Aboriginal skulls. What is more the Kow Swamp and the Lake Mungo crania are opposed in form: in terms of metrical analysis the Lake Mungo remains are at one end of the spectrum, the Kow Swamp population at the other. Recent Australian crania fall between these two extremes.²⁷ To complicate things further there has been much discussion of the fact that the Kow Swamp and related material resembles ancient fossil skulls from Java which are classified as *Homo erectus*.²⁸ The age of the Javanese material is still open to question but is certainly considerably older than the Kow Swamp remains.²⁹

Thorne, who has carried out the most research into these recent finds of fossil man in Australia, has recognised the dilemma they pose for any consideration of the origin of the Australian.³⁰ He has set up three models to account for the variations in the crania:

1) That two separate groups entered Australia at different times, each group radically different from the other, and later these groups merged to form the existing Aboriginal population.

2) That two separate groups, each different, entered Australia at roughly the same period and later merged into the existing population.

3) That one group entered Australia, later producing a greater range of forms, but subsequently this variation was reduced to that of the existing population.³¹

Thorne has not attempted to link his models with any exact chronology or to changes in sea level. He does state, however, that the 'existing skeletal evidence is quite consistent with occupation of the continent 60,000, 80,000 or even 120,000 years ago'.³²

In fact if we adopt the approach taken by Thorne and relate it to our earlier discussion of changing sea levels his models can be adjusted and added to. It would be tantalising to imagine that the Kow Swamp population are the remnants of a group which entered Australia in great antiquity and who were descended from the *Homo erectus* communities in Southeast Asia. The low sea level existing at 160,000 BP and the long time the sea was low would fit such a theory. The Mungo-type group could have entered at this time or at the later low sea level period at 50,000 BP. Finally a third group, related to the existing Aboriginal population, could have entered at the last period of low sea level, at 20,000 BP. Thorne's models all assume that modern Aboriginal groups are descended from the earlier forms represented in the fossil record. This may be so, but there is no evidence to confirm or deny it. It may well be that the present day Aborigines are late immigrants (as indicated in my model) and the forms known from the fossil record may have become extinct without mixing with other populations. Indeed, if we rely on the theory that there is a connection

²⁶ The latest discovery is reported in Bowler and Thorne 1976.

²⁷ See the discussions in Thorne 1976, 1977.

²⁸ Macintosh, who once supported such a connection, later rejected it, stating that the Kow Swamp material fell within the range of known modern Aboriginal skulls (Macintosh and Larnach 1976:117).

²⁹ The age of the *Homo erectus* may be as old as two million years and the youngest material about 250,000 years old; see Jacob 1976.

³⁰ Thorne 1977.

³¹ Thorne 1977:198.

³² Thorne 1977:196-197.

between low sea levels and the migration of groups into Australia, a whole range of models can be drawn up following Thorne's lead. One can start with three groups or even more; one can reduce the number of groups; one can miss out a period of low sea level as a possible time for migration and in each model allow the groups to interbreed, to become more or less morphologically diverse or make certain lines die out. Given the period of time involved and the various changes in sea level the number of alternative models that can be constructed is surprisingly large.

But the problems of these early fossils and the homogeneity and diversity among existing Aboriginal groups still remains. Why must we assume that the Kow Swamp population is an archaic group reflecting the survival of 'primitive' *Homo erectus* traits? If the Kow Swamp groups had been in Australia for 150,000 years there was ample time for changes to have occurred within the population. Wright has challenged the view that the Kow Swamp population was primitive, arguing instead that the robust morphological features could be the result of adaptation in the Australian environment to particular ecological conditions.³³ Perhaps in Wright's approach we can see a possibility for both adaptation and the retention of particular features from earlier times. When the sea level fell in Southeast Asia not only was the area of land increased but the climate and vegetation also changed. In terms of climate the tropical climatic zones shifted³⁴ and with these larger changes (as well as local micro-climatic alterations associated with the increase in land masses, changes in ocean currents, sea temperatures etc.) the vegetation cover also altered.³⁵ Of particular interest is the alteration in areas of tropical rain forest in both Australasia and Southeast Asia and the increase in areas of grassland. The robust features associated with the Kow Swamp material may well reflect an adaptation to such an environment and a dependence on grass seeds for nutrition, the large molars being used to crush the grains. With later changes in sea level and climate, groups adapted to such conditions would have been restricted in range, but Australia would have provided an excellent and fairly large habitat for them. One could extend the argument to include the Lake Mungo group and suggest they are descendants of groups adapted to different conditions, say a tropical rainforest existence.

One problem in such discussions is that the morphological variations detected in the remains of early Australian man are based almost entirely upon analysis of cranial features. Though extensive postcranial materials (i.e. rest of the skeleton other than the skull) were recovered from Kow Swamp and Lake Mungo there has been little published on these remains. This is unfortunate as much research has been carried out on the postcranial remains of fossil man elsewhere with interesting results, particularly concerning locomotion, arm and hand movements, etc.³⁶ Another problem which has not been faced is the evolutionary significance of the remains. The origin of the Australians, because of the time period involved and the variations in fossil forms, is no longer a question of history or prehistory but also of human evolution. Morphological analysis of the fossils translated into temporal sequences is not enough; methods of classification combined with a knowledge of how evolutionary changes occur need to be developed which relate the Australian material to remains from elsewhere in the world. The answers to the problem of whether one group or many

³³ Wright 1976; see also Brown 1976 regarding recent changes in Aboriginal crania.

³⁴ Rognon and Williams 1977; Macfarlane 1976 argues that physiologically Aborigines appear to have come from a tropical region.

³⁵ Verstappen 1975.

³⁶ The literature on such studies is extensive; Stewart 1975 summarises his studies of Neanderthal postcranial material; see also Trinkaus 1977.

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came to Australia and what exactly earlier groups may have contributed to the present Aboriginal population have to be sought *outside* Australia.³⁷

Where did he come from and why did he come?

The problem in asking the question 'where did he come from' is that it seems to assume that there is a place to be located somewhere in a particular time. Such a search may indeed prove elusive. Earlier scholars tended to seek answers in terms of links with apparently similar surviving hunter-gatherer groups living contemporaneously outside Australia, hoping to establish by such connections not only a biological link but also a locality for dispersion. The chief candidates — Veddas, the Ainu, the Malaysian 'Negritoids', the Andamanese and the Papuans — were somehow assumed to have stayed where they were or at least failed to make it to Australia. Subsequently great effort has been expended to find more scientific bases for such connections, using all the methods available to modern anthropologists. The results have proved disappointing. The hunter-gatherer groups show more affinity with the other inhabitants of their region (i.e. the Negritos of Malaysia with ordinary Malaysians and the Ainu with the Japanese) than with distant populations such as the Aborigines.³⁸

Asking the question 'where?' implicitly suggests migration from a source into Australia. Many discussions of the origins of the Australians contain maps showing arrows starting from some ill-defined source on the Asian mainland sweeping broadly across island Southeast Asia and into Australia. An endless stream of humanity, it would seem, sought out the Australian continent as if it were some promised land, Australia and Tasmania being the ultimate reward for intrepid nomads. All this reflects what can only be called Greater Australian Chauvinism. But what evidence have we for such movements, much less a migration? The answer is none, beyond the fact that man must have come from outside the continent. And what was supposed to have motivated this movement? No adequate answer has been provided.

Another point much discussed in the literature is whether Australia was 'discovered' by accident or by design.³⁹ The problem is false — because we can never know. If the first contact was accidental the chances of archaeologists discovering the evidence to prove such a theory are very slim; we cannot rediscover an 'event' in prehistory. To assume that the contact was purposeful not only presumes that the people concerned had a prior knowledge of what lay ahead but also that prehistorians can recapture the intentions of those in antiquity, which of course they cannot.

In many ways the question of the origin and the migration of man into Australia has suffered from analogies with theories concerning the populating of America, the other great uninhabited continent settled by man during the Pleistocene. Undoubtedly the American situation was very different from the Australian,⁴⁰ for man entered America from Asia at a northerly latitude where climate and landscape were not favourable either for large scale settlement or, during really cold periods, for the movement of groups. Mainland and island Southeast Asia contained excellent environments for human settlement, whereas the harshness of much of Australia provided poorer opportunities than the interior of the Americas.

This brings us to another point much discussed in the literature on the origin of the Australians. At no time was the continent of Australia linked to Asia by a continuous land bridge. Man must have crossed regions of sea. This topographical barrier,

³⁷ Some early writers believed that man developed into *Homo sapiens* after reaching Australia (see opening discussion in Kirk and Thorne 1976). One modern writer has expressed the opinion that man developed independently within Australia and later moved out into Asia (Gallus 1969).

³⁸ Lie-Injo 1976; Simmons 1976; Kirk 1976.

³⁹ Calaby 1976:23.

⁴⁰ One Australian prehistorian (Hallam 1977) has suggested that the Australian material can provide examples for American migration; this too is highly dubious.

which has existed between Australasia and Asia for thousands of years, has quite important biogeographical implications for it acted as a barrier to restrict the interchange of plants and animals between the regions. Prehistorians have placed great emphasis, perhaps too much emphasis, upon this barrier. The zoogeographic barrier has been recognised as lying along a line drawn during the last century by Alfred Wallace and named after him. Wallace's line is discussed in most of the accounts of prehistorians with various degrees of precision: sometimes the barrier approximates to that intended by Wallace, sometimes to that line taken from Wallace and adjusted by Thomas Huxley and sometimes to a figment of the prehistorians' imagination. 'Wallacea' is boldly written across a vast area of island Southeast Asia. Jones has summed up the position of many prehistorians: 'Wallacea, with its numerous water barriers, was the *decisive* geographical influence on the prehistory of man on the Australian continent'.⁴¹ But was the barrier decisive? Was it even important?

It is questionable whether a clear line can be drawn to separate the Australasian region from Asia. Many scholars have attempted to construct a firm line to represent the zoogeographic barrier but as Simpson has recently noted there are 'too many lines'.⁴² The flora and fauna do not suddenly change at any one point and there are grounds for considering most of island Southeast Asia as a transitional zone between Asia and Australasia. At the same time, whatever line is accepted, it is a line drawn by specialists after a detailed examination of a number of factors. It is highly unlikely that the changes between regions were consciously recognised by man in antiquity. Indeed, most groups were probably unaware that they had crossed from one region to another even if we assume that a clear line exists and movement was always one way (i.e. towards Australia).⁴³ It might be argued that even if we attempt to dispose of the concept of a single biogeographic barrier we are still left with a topographical barrier imposed by broad sea channels separating the Asian islands from Australasia. Recently, however, Verstappen⁴⁴ has noted that climatological barriers in the region, especially those associated with changed climatic conditions during periods of changing sea levels, may have imposed more important limitations to the movement of man and animals than topographical barriers. Simpson has noted that between the edge of the Sahul shelf and the edge of the Sunda shelf lies a region which might be considered a *separate* zoogeographic zone. This region consisted mainly of islands even when the sea level was at its lowest in the Pleistocene. Dunn and Dunn⁴⁵ have independently recognised a division of the region into Mainland, Sundaic and Insular Southeast Asia during the Pleistocene. In the past there has perhaps been too much emphasis upon mainland continental areas and too little recognition of the importance of the insular region which has long existed between Asia and Australia.⁴⁶ The low sea levels were thought to be important only in that they brought the mainland areas into closer proximity and presumably encouraged migration from Asia southwards. As we have seen the idea of a single source for the origin of the Australians in mainland Southeast Asia has not been proved and the idea of migration is based upon assumptions which have no basis in the existing evidence. Instead of concentrating on mainland Asia and on the Sunda shelf itself, closer attention should be paid to the island world lying in between.

At the same time we need to stop thinking in terms of static models (periods of high sea level and periods of low sea level) and instead develop dynamic models

⁴¹ Jones 1973:278 (my emphasis).

⁴² Simpson 1976; see also Calaby 1972.

⁴³ There has long been evidence that man crossed these 'barriers' in the Pleistocene as his stone tools have been found on the Australasian side of Wallace's line; see Mulvaney 1970.

⁴⁴ Verstappen 1975:14.

⁴⁵ Dunn and Dunn 1977.

⁴⁶ The title *Sunda and Sahul* (Allen, Golson and Jones 1977) reflects this attitude — as if nothing of importance lay between the two shelves.

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concerning the rise and fall of sea levels over specific periods of time. Such models would have to take into account not just changes in the topography of the region but also alterations in the climate and changes in the flora and the fauna which accompanied the rise and fall of the sea levels. Tindale⁴⁷ has suggested that alterations in sea level should be seen as *promoting* the movement of people rather than just providing easier access between regions, but few prehistorians appear to have noted the importance of this suggestion.⁴⁸

At periods of high sea level Australia and Asia were separated, as they are today, by a region of thousands of islands. As the sea level fell these islands grew larger, some became joined while elsewhere new islands emerged, some of which remained islands during the lowest period of sea level and others eventually became parts of continental shelves. However, even at the period of lowest sea level a mass of islands remained. Therefore the fall in sea level did not just produce continental shelves but at various times a host of new islands which were colonized by plants and animals. This colonization was influenced by changes in climate, wind and tide patterns which accompanied changes in sea level. It is highly possible that coastal Southeast Asia and many of the adjacent islands were inhabited by man long ago in antiquity, perhaps by groups of people living off the rich inter-tidal and marine life of the region. As the sea level fell these groups would have moved out onto neighbouring islands after plants and animals had colonized the newly emerging land. In the short term the area of coast and inter-tidal zone open to exploitation would have expanded but in the long term, especially after the formation of continental shelves which united islands and altered the coastline, the area of coast would have been reduced. Bowdler⁴⁹ has recently argued that in the case of Tasmania the rise in sea level would have increased the area of coastline open to exploitation by man. Dunn and Dunn⁵⁰ have calculated that the area of coastline in Southeast Asia was reduced by 54 per cent when the Sunda shelf was at its maximum 20,000 years ago. If this were so, people living on mainland Southeast Asia would have been forced coastward and out onto neighbouring islands. Climatic changes would merely have compounded the pressure to move. As the sea level rose once again, drowning land masses and low lying islands, people would again be forced to move. The process would not be an exact duplication of the rise of sea level because areas *already* colonized by plants and animals would be drowned. While along mainland margins and in other regions a greater area of coastline would be available for exploitation, a number of important island areas would be lost. In some areas man would therefore benefit from the changes, in others new pressures would have forced new movement.

The movement of man between Asia and Australia should be examined against this background of the rise and fall in sea level. Changes in sea level are now viewed as a cause of movement, rather than just the means of movement, through the emergence of new areas of land. In these movements man could have crossed from Asia into Australia and back again just as some animals did. Large placental mammals (such as now extinct forms of elephant) crossed into islands just to the north of Australia and certain marsupial species (such as the cuscus) moved northwards.⁵¹ Calaby⁵² has noted that large animals having greater buoyancy and smaller creatures with the ability to cling to driftwood were excellent candidates for movement across the water barriers. Man, as part of the fauna, could have moved in the same directions even if he had lacked the assistance of watercraft.

⁴⁷ Tindale 1967.

⁴⁸ But see Mulvaney 1971:377-378.

⁴⁹ Bowdler 1977:212-213.

⁵⁰ Dunn and Dunn 1977:6.

⁵¹ Hooijer 1975.

⁵² Calaby 1976:23-24.

In many discussions of the origin of man in Australia, insular Southeast Asia appears as a void through which groups moved southwards. However it has been known at least since the end of the last century that an earlier form of man lived on Java a very long time ago. If man had existed just to the north of Australia for thousands, if not millions of years, it was just a matter of time before groups, spurred on by changing conditions, found their way to Australia.

My earlier discussion of possible dates for the first entry of man into Australia was based on the assumption that periods of really low sea levels were the crucial factor in the movement of man. These periods are obviously important but by adopting a dynamic model of sea level change what becomes equally important is the *rate* of rise and fall in sea level. In terms of cause and effect a rapid change in level, particularly a rapid *rise* in sea level, would have precipitated greater movement than a slow change. Not only would groups have become trapped by a rapid rise in sea level but climatic changes would also have occurred at a faster rate. One particular period during the Pleistocene stands out in this respect: the change at c.50,000 BP when the sea level rose and fell rapidly (see Figure 1). Such a date (say between 50-40,000 BP) would fit closely with archaeological evidence for the first settlement of Australia, though older dates cannot be entirely dismissed. The use of a dynamic model of sea level change to explain movements of man in insular Southeast Asia is attractive in other ways. Examining the changes in sea level which have occurred in the region during the last 240,000 years it is clear that while there have been only three periods of really low sea level there have been numerous occasions when the sea level changed to lesser degrees (see Figure 1.) At such times areas of land would have been gained and lost in particular areas, causing local movements of people. Groups isolated by sudden and short movements in sea level could have found themselves trapped within restricted environments and under pressure for survival.

Such varied responses to changing sea level in insular environments are of great importance in any understanding of the populations of not only Southeast Asia but also Australasia. It is very likely that even if the population of Australia was derived from mainland Asia this population was already varied (the term used by evolutionists is polytypic)⁵³ and that groups existing in the Southeast Asian archipelago were even more polytypic due to their periodic isolation on islands. The patterns of evolution in the islands would have been different since the isolation of some groups would have been brief (when quite small changes of sea level reunited groups separated for short periods), while other groups could have been isolated for long periods of time and these communities, probably adapted to specialized ecological niches and formed a closed world; in such conditions certain distinctive morphological features could have persisted.⁵⁴ When large changes in sea level occurred these groups could have been released to mix with other population groups who had experienced greater changes, or, which is more likely the case, such contact could have doomed the isolated communities. It is possible that the Kow Swamp population may have been descended from a group isolated *outside* Australia for a long period in restricted habitats but who, after 20,000 BP, were able to enter Australia because of lower sea levels. Here they persisted, perhaps because they continued to exploit a restricted habitat or because they avoided other groups. Eventually the men might have been killed and the women absorbed by other groups, or there could have been free interbreeding between themselves and a larger more 'modern' population.⁵⁵

The significance of the island world for an understanding of the origin, affinities and evolution of man in Australia is considerable. Australian prehistorians have discussed the importance of island life near Australia,⁵⁶ but have not as yet extended

⁵³ See Mayr 1963.

⁵⁴ Simpson 1953:306-307.

⁵⁵ Mayr 1963:338-339.

⁵⁶ Diamond 1977; Jones 1977a; Lampert 1977.

their studies to the islands of Indonesia. It may be that the Australians are descended from heterogeneous groups in island Southeast Asia who, within continental Australia, evolved into a more homogeneous population. In island Southeast Asia groups remained isolated as the sea level rose but eventually improved watercraft allowed contacts to be renewed and new groups to enter the region from mainland Asia. However, in present-day eastern Indonesia and particularly in New Guinea the diversity of groups and languages which exists may be evidence of earlier heterogeneous island communities.

How did he come? Why did he become isolated?

To cross the sea barriers separating areas of land to the north of Australia man must have used some kind of water transport. This may just have been on flotsam but the prehistorians' common assumption is that the form of transport, however unsophisticated, had been fashioned by man for the purpose of movement. The use of water transportation is therefore considerably older than previously imagined.⁵⁷ It is often assumed that man, moving from mainland Asia 'to Australia', had to acquire the skill of using water transport and thus the use of boats is a sign of cultural achievement. Such ideas become less important if the concept of migration is restricted to short movements and also if we assume that island Southeast Asia had been inhabited by man for some considerable time. Inhabitants of the archipelago would have grown accustomed to maritime life, travelling between islands and visiting reefs and banks which were within sight and local knowledge. Swimming may have been well developed and, with the assistance of log floats, used singly or tied together to form a raft, could have extended the range of man's activities. Such forms of water transport are well known from ethnographic reports throughout Australia, but attempts to use these and other ethnographic references to Aboriginal watercraft to reconstruct possible forms of transport in prehistory may prove incorrect.⁵⁸ The most one can say is that whatever forms existed were unlikely to have been more sophisticated than the simplest forms known from recent ethnographic reports.

Some kind of navigation must also have been involved. It has been shown that many of the water barriers between islands in Southeast Asia and between Asia and Australia, even at the lowest periods of sea level, were such that no areas of land were visible over the horizon to encourage men to sail onwards. However, a people with experience of living in a world of islands may easily have moved out into the unknown with faith that islands existed somewhere in the distance, as Polynesians, thousands of years later, ventured into the Pacific. The flight of birds and the presence of flotsam may also have indicated that land lay ahead.

There is no reason to suppose that given the technology for movement across water barriers and perhaps navigational skills, however limited, man could not have maintained an extended contact between Australia and islands in Southeast Asia. The concept of migration conditions thought in terms of one way movement. But the period of time when such movement was possible was restricted. Whenever the sea level rose, water distances increased and the patterns of tide, wind and current made formerly easy crossings too dangerous. A similar situation has been recorded in the modern ethnographic literature: the Bentinck Islanders in the Gulf of Carpentaria carefully calculated the costs in human life of movement between islands.⁶⁰ As the sea levels rose technology did not develop fast enough to keep pace with the widening of distances so groups on islands and on continental margins became isolated from each other. In this manner the Aborigines became isolated from island Southeast Asia and this isolation is critical in Australian prehistory.

⁵⁷ Macintosh 1974; Hallam 1977.

⁵⁸ See the discussions of transport in Birdsell 1977; Tindale 1977.

⁵⁹ Levison, Ward and Webb 1973:62.

⁶⁰ Tindale 1977.

The isolation of continental Australia began with the drowning of the Sahul shelf, the separation of the islands of Indonesia and the breaking of the land link with New Guinea. But the separation of people may have begun well before the separation of the land. The coastal region of the Sahul shelf may have been quite sparsely populated for a long period as the supporting vegetation and marine life would have been poor if erosion was rapid and ecological conditions unstable.⁶¹ The low lying area of the shelf behind the coastal dunes may have consisted of swamp, covered by saline water for much of the year with few supplies of fresh drinking water. Neither the coast nor the hinterland would have provided a good environment for human occupation. Even if man had lived here the isolation from New Guinea may not have occurred gradually as the sea level rose. Firstly quite small rises of sea level could have drowned vast areas of shelf quite suddenly. Secondly, the coast could have been protected by sand dunes while the hinterland was below sea level. Sudden storms could have breached these defences and drowned vast areas. The increase in the area of ocean to the north of Australia brought changes to the climate of the region and cyclonic activity would have increased.⁶² The opening of the Torres Strait sometime between 6500 and 8000 BP may have added to these changes as well as altering the pattern of sea currents.⁶³

There are, however, two things involved in the isolation of man in Australia from the wider world: firstly the Aborigines never developed the skill or the desire to unite themselves with neighbouring New Guinea or Asia and secondly though such technology and skills were available for a long period in both Asia and New Guinea contacts with Australia appear only to have occurred in quite recent times.

Not only were the mainland Aborigines isolated from New Guinea and Asia but in Tasmania another group became isolated at about 10,000 BP when the Bass Strait was flooded. Jones⁶⁴ has recently argued that the isolation of the Tasmanians for thousands of years had a drastic effect on their culture. Not only was their gene pool severely restricted but there are indications in the archaeological record that important technological skills and subsistence techniques were lost or abandoned. The implications of such an argument are disturbing and appear to run counter to all our accepted beliefs concerning human culture. Jones' argument concerning the Tasmanians might be extended to the culture of the Aborigines.

For a very long period the size of the Aboriginal population in Australia may have remained fairly stable though the density of population varied according to local ecological conditions.⁶⁵ Over vast areas sustained contact between neighbouring groups was minimal because of enmity, harsh ecological conditions and other factors; thus as a whole the Aborigines were isolated from outside influences and ideas and relationships between groups within the continent were often restricted. The development of human culture which we can trace in other parts of the world may have been dependent not solely upon internal innovation or upon the diffusion of ideas from outside, but upon a subtle combination of the two. It is probably *increasing* communication between *expanding* populations which promotes innovation and change; in Australia both of these were lacking. This is not to suggest that Aboriginal culture never changed or that it is regressed from some earlier 'higher' state. It does suggest, however, that the pattern of life was very different from the recent history of most other parts of the world and perhaps more akin to that experienced by man

⁶¹ Chappell and Thom 1977.

⁶² Webster and Stretten 1972:50; Chappell 1976:18-19.

⁶³ Webster and Stretten 1972:47; Nix and Kalmer 1972:87.

⁶⁴ Jones 1977c.

⁶⁵ Birdsell (1957) suggested that Australia was populated rapidly and most areas were occupied shortly after the first settlement. His hypothesis has recently been challenged, but this is not the place to discuss the interesting arguments about how Australia was settled, how quickly and whether or not all regions were colonized at an early period.

at earlier periods when he existed as a hunter-gatherer for thousands if not millions of years. Change and innovation were very gradual and cultural traditions and ideologies were developed which stressed the continuity and maintenance of culture rather than discontinuities and alteration. The consequences of such a tradition can be seen in what we can reconstruct of Aboriginal life as it existed before the coming of the Europeans and there are indications from the archaeological record which confirm the persistence of cultural traits. In spite of local differences and linguistic variation Aboriginal culture was remarkably homogeneous.⁶⁶ Differences which Europeans encountered at first contact, for example in circumcision practices and ritual observances, were not fixed, and there is much evidence of diffusion across wide areas in recent times. Continuity and homogeneity at a general level was being re-established. Given variations due to the availability of resources and differences in subsistence patterns, the technology of the Aborigines also shows a homogeneity over large areas and, for stone technology, over long periods of time.⁶⁷

Outside Australia, particularly in island and mainland Southeast Asia, the pattern of life since the end of the Pleistocene has been very different. Populations expanded tremendously, patterns of subsistence altered, particularly with the introduction of agriculture, and the diffusion of ideas and practices increased greatly. One of the most important innovations was the development of maritime skills. Communities learnt to overcome the limitations imposed upon movement by the rise of sea levels and even colonized new areas previously inaccessible to man. The islands of Southeast Asia were settled by Austronesian-speaking peoples and with their skill of building sailing boats they reached Madagascar across the Indian Ocean and in the other direction settled the islands of Micronesia, Polynesia and eventually parts of Melanesia. Solheim⁶⁸ has recently suggested that the origin of the Austronesian-speaking peoples should be sought not in mainland Southeast Asia, as was previously thought, but in the islands of eastern Indonesia.⁶⁹ The Austronesian-speaking peoples were thus the inheritors of that island existence from which the Aborigines may have originated: isolated on their islands, they developed the technology to conquer the sea and spread beyond island Southeast Asia without the assistance of lower sea levels.

Though the early Austronesians, the Indonesians and later the Papuans of coastal New Guinea possessed the technology and the skills to reach Australia there are no signs that they did so, at least until very recent times.⁷⁰ The reasons for this are unclear though it may well have something to do with the prevailing wind systems to the north of Australia which tend to force sailing ships westwards. Only in very recent times did the Macassans begin to visit northern Australia from Sulawesi (the Celebes), and then not to colonize Australia but merely to exploit the rich resources of trepang for oriental markets.⁷¹ It was people from a very distant place, Europeans, who were to conquer and to colonize Australia. Only then did the isolation of the Aborigines suddenly and violently end.

Queries about the origin and the antiquity of man in Australia are still as relevant today as when they were first asked, but modern scholars have inherited many of the prejudices and assumption of earlier periods. Recent research as yet provides few

⁶⁶ Dr Horton has pointed out that all I may be saying here is that they were all hunter-gatherers. This may be true but there is more to this homogeneity than just the patterns of subsistence which anyway varied considerably according to ecological conditions.

⁶⁷ Although there do appear to have been quite sudden alterations in stone tool technology; the cause of these alterations is still unknown. On stone tool traditions in Australia see Mulvaney 1975 and the papers in Wright 1977.

⁶⁸ Solheim 1975.

⁶⁹ See also Bellwood 1975:25.

⁷⁰ Keats (1970) has established genetical links between the Aborigines of Arnhem Land and the people of southern Papua-New Guinea. The explanation of these links still needs elucidation from other sources.

⁷¹ Macknight 1976.

clear answers but scholars have been forced to re-examine the basis of the original questions. At the same time recent discoveries have complicated many of the issues involved. Not all new methods have fulfilled expectations; in particular genetical analysis has failed to establish clear connections between distant population groups which can be interpreted in terms of direct relationship over long periods of time. The really significant advances have occurred in archaeology with the establishment of a more exact and extended chronology and the discovery of fossil remains of great importance. These advances have all occurred in quite recent years. Co-ordinated archaeological programmes have been a recent innovation. The number of properly investigated sites is still minute, particularly when we consider the size of the continent and the depth of time involved in man's prehistory in Australia. These sites are nearly all concentrated in southern Australia; the north and centre have hardly been investigated.

Studies of the antiquity of man in Australia cannot afford to be parochial: solutions to many of the problems relating to Pleistocene man in Australia must be sought elsewhere, in particular in island Southeast Asia. Archaeological investigation in much of the archipelago is still in its infancy, and the quality of some work is open to question.⁷²

Island Southeast Asia is an important area for the consideration of both cultural changes and patterns of evolution in human populations. If man has inhabited the region for thousands, if not millions of years, then changes in sea level must have produced startling differences between populations isolated periodically. If the Aborigines' immediate past lies in island Southeast Asia, rather than in mainland Asia, then their ancestors were affected by these variations. Scholars have a unique opportunity not only to place Australian prehistory in its proper perspective, but also to make fundamental contributions to our understanding of man in prehistory.

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⁷² Hutterer 1977.

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