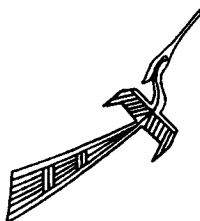# Indo-Malaysians of the
Last 40,000 Years

The raw data required for any discussion of origins, distributions, and differentiation amongst recent Indo-Malaysian populations are drawn from two very different and specialized disciplines. These are *population genetics*, which studies the distributions of the factors that determine heredity, and *biological anthropology*, which from the point of view of this book is concerned with the analysis of living and skeletal phenotypes (in the latter case, the discipline is better referred to as *paleoanthropology*). As with the debate over *Homo erectus*, so too the debate over modern human origins and differentiations is currently quite heated. Answers are not simple, but because modern humans still exist, the answers can perhaps be a little less elusive than those for hominids of half a million years ago.

The present populations of the Indo-Malaysian region are, of course, varied. The variation is expressed as in all human populations through a hierarchy of levels: from individuals through ethnolinguistic groups and geographical zones, eventually to the level of the major races of mankind. The concept of race is clearly quite important when considering prehistoric relationships, but it is a concept that tends to evoke a good deal of argument (e.g., Littlefield et al. 1982), as well as emotion and concern over the dangers of political misuse. From a purely scientific viewpoint, one extreme view states that there are no races—only clines—while at an opposite pole are the "pure race" theories that prevailed in earlier physical anthropology. For an intelligible narrative of prehistory, some concept of race is necessary; it would be unreasonable to claim that there is no geographical patterning to human variation at all. This view would force us to consider every small group independently in terms of its place in a whole-world range of variation—clearly an impossible and unnecessary task.

Definitions of race are numerous. I will use one given by Buettner-Janusch (1966:184):

> A race of *Homo sapiens* is a Mendelian population, a reproductive community of individuals sharing a common gene pool. All members of our species belong to one Mendelian population and its name is *Homo sapiens*. This large specieswide Mendelian population may be divided into smaller Mendelian populations, for all practical purposes an indefinitely large number of them.

Buettner-Janusch's last sentence makes it clear that racial classifications are by nature both hierarchical and diffuse; they are ideal subjects for ramified subdivision. If entering the hierarchy at the top, it is traditional to claim that the populations of the Indo-Malaysian Archipelago belong to two of the major geographical races of mankind: the Australo-Melanesians (or Australoids) and the Mongoloids (or, more specifically, Southern Mongoloids). This gross splitting is a heuristic device, for human populations at all times must have shown intergrading or clinal characteristics, just as they do today. But the differentiation is not made lightly; there are strong biological and historical grounds for suggesting that one of these groups (the Southern Mongoloid) has expanded very widely through a prior Australo-Melanesian continuum within the past 10,000 years. Both genetic and skeletal data support this view.

From this perspective the present racial geography of the Indo-Malaysian region is not due *entirely* to local evolution—without population movement—since the time when the first anatomically modern humans entered the region. It is true that all populations are subject to natural selection, and where breeding groups are small they will be especially subjected to genetic drift for proportions of specific genetic polymorphisms. These types of in situ differentiation amongst relatively or wholly isolated populations have clearly been fundamental to race formation in *Homo sapiens*, but they are insufficient to explain the large-scale geographical distributions of the races of mankind prior to AD 1500. Some of these, such as the Southern Mongoloids of the Indo-Malaysian region, have clearly expanded on a very large scale to absorb, replace, or surround pre-existing populations.

In already settled areas, major expansions such as this could presumably only have occurred when populations with considerable numerical/demographic and technological advantages impinged on less resistant groups. Prior to the development of agriculture and the attendant and rapid growth in population size and technology, it is unlikely that opportunities for such large-scale expansion into regions already settled would have presented themselves often (Brues 1977:251; Krantz 1980; Bellwood 1994). This, however, is a frequency-dependent and scale-dependent statement, for small groups of hunters and gatherers certainly did move quite large distances during the span of human evolution,

even into regions previously but lightly settled. But they probably colonized through such previously settled regions only rarely.

If my views on these matters are generally correct, then the major Old World races of mankind, which occur in often widespread and scattered distributions today, would have been more integrated with respect to geographical distribution in the Pleistocene past. In short, the Pleistocene should have witnessed fewer phenotypic boundaries and a more continuous network of gradual clines, broken only by major environmental barriers to human interaction. Organized agriculturalists can quickly dominate sparse groups of tropical forest hunters, but those sparse hunters would be much less likely to have such advantages with respect to other hunters with similar population densities and technology. During the Pleistocene, gentle clines of variation can be expected, while the present pattern—particularly in Southeast Asia—often reveals quite sharp interfaces.

I. THE MODERN POPULATIONS OF THE INDO-MALAYSIAN REGION

The vast majority of the inhabitants of this region today are of Southern Mongoloid phenotype. The rising population of over 250 million people is exemplified by such important groups as the Malays, Javanese, Balinese, and Filipinos. It is obvious that the whole archipelago is now a part of the Mongoloid world of East Asia, which also extends into many of the islands of the Pacific and right through aboriginal America. But there are other populations that, although small in number, are of great significance from a historical viewpoint. These comprise the Negritos of Malaysia and the Philippines, and the Melanesians, who extend westward from their own core region around New Guinea into the eastern islands of Indonesia. Following Coon (1966), I define both these populations as being of basically Australoid (perhaps more meaningfully termed *Australo-Melanesian*) inheritance.

A. The Negritos

The short-statured Negrito populations (Plate 2) of the region comprise the Peninsular Malaysian Negritos (formerly called "Semang"), who inhabit the mountainous region from Pahang north to the Thai border, and the Negritos of the Philippines who inhabit both coastal and inland localities in pockets of Luzon, northern Palawan, Panay, Negros, and Mindanao (for distributions of the Philippine groups see Chapter 4, Fig. 4.2). The Andamanese, with whom I will not specifically be concerned, are also normally classified with the Negrito group.

The Negritos of Malaysia and the Philippines are traditionally forest and coastline hunters and gatherers and they differ quite sharply from their Mongo-

loid neighbors, despite occasional intermarriage and the presence of a pheno-
typically intermediate population in the Senoi of central Peninsular Malaysia
(Plate 3). Stature is usually quite small, averaging around 145 to 155 centimeters
for males, but there is some overlap here with surrounding populations, many
of whom are also of short stature (Polunin 1953; Rambo 1988). In appearance
these people are dark, with tightly curled hair (sometimes red or brown), and in
facial features they resemble small and gracile Melanesians. The simplest con-
clusion concerning them is that they are the small-statured representatives of a
once widespread Australo-Melanesian population that comprises the extremely
varied peoples of Australia and Melanesia today, but that has been absorbed
almost entirely into a much more numerous Mongoloid population in South-
east Asia.

Simple conclusions, however, are not always uncontested conclusions. Omoto
(1987), on the basis of a multivariate analysis of gene frequencies, has suggested
that Philippine Negritos show a relationship to other Mongoloid Filipinos that
is not entirely the result of recent intermarriage. Harihara et al. (1992) also
point out that Philippine Negritos (Agta) have a high frequency of a 9-base-pair
deletion in their mitochondrial DNA genotype, a deletion that is also common
in Asian Mongoloid populations and Polynesians.[1] Hanihara (1990) also presents
data from dental measurements that appear to relate the Negritos to the prehis-
toric Jomonese populations of Japan, together with the ethnographic Ainu of
Hokkaido. Teeth, however, are one thing, skulls another. Brace et al. (1991) offer
no doubt from craniofacial evidence that the Southeast Asian Negritos are most
closely related to Australians and Melanesians (see also Bellwood 1993 for fur-
ther opinions on Negrito ancestry).

Historical scenarios that might reduce these apparent conflicts will neces-
sarily be reticulate in nature. Both Negritos and Southern Mongoloids must
share a degree of common ancestry, as do all modern humans, but with a super-
imposed history of long subsequent separation followed by recent (about the
last 4,000 years) occasional hybridization through intermarriage, especially in
the Philippines. The phenotypic differences between Negritos and Southern
Mongoloids are clearly sufficient to indicate that both cannot simply be seen as
variants within a single intergrading population. Similarly, the Southeast Asian
Negritos have also been long separate, perhaps for over 40,000 years, from their
distant cousins in Australia and Melanesia.

This still leaves the question of short stature to be explained. It should be
noted here that there is no skeletal evidence that would give any support to the
idea that the peoples of the Indo-Malaysian region were ever all short-statured
Negritos. That they were once all of generalized Australo-Melanesian affinity is,
however, a much more supportable proposition. The short stature may be
simply a localized independent development. For instance, there are similar

short peoples in the New Guinea Highlands not otherwise distinct in appearance from their neighbors, who are Melanesians of normal stature. In this case the explanation is probably natural selection within a small part of the range of a generally taller population; small stature may have great adaptive value in mountainous tropical forest environments with limited nutritional resources, where a high ratio of strength to body weight is advantageous (Gajdusek 1970; Howells 1973b:173–174). According to Cavalli-Sforza (1986), small body size in African Pygmies might also help to decrease internal body heat during exercise in a hot, humid climate, thus reducing sweating. Gates (1961) suggested that the New Guinea Pygmies owe their short stature to a local and recent mutation at perhaps a single genetic locus. This view has not been acceptable to many physical anthropologists (e.g., Birdsell 1967:108), but studies of African Pygmies have shown that they are markedly deficient in the production of the insulin-like growth factor IGF-I (Merimee et al. 1981). It is not clear what environmental conditions have promoted this deficiency, but there has presumably been strong selective pressure to favor its survival, and a tendency to short stature in the interiors of other large islands in Melanesia has also been noted.

These views on local adaptation may explain why certain groups have attained short stature, but they still do not explain why all the Malaysian and Philippine peoples of Australo-Melanesian affinity (i.e., the Negritos) are relatively small people. A possible explanation may be that they were already occupying interior or remote environments that selected for short stature when Mongoloid dominance in the archipelago began to develop. Their larger-statured neighbors in regions of high agricultural potential would thus have become absorbed into the present population, while the Negritos, partly through chance and inaccessibility, might have been isolated until recently. Even though Negritos and their neighbors have been in frequent cultural and linguistic contact with agriculturalists (Reid 1987; Headland and Reid 1989), the overall picture suggests that the surviving groups have always maintained a high degree of genetic independence from their neighbors.

It should be noted in this respect that all the Philippine Negritos have adopted Austronesian languages today (Reid 1987), just as all the Malaysian Negritos speak languages in the Mon-Khmer subgroup of Austroasiatic (Benjamin 1976). Prior to the dispersals of the Austronesian and Austroasiatic peoples, the Negritos must have spoken other languages, of which there are indeed some faint traces, especially in the Philippines (Reid 1994a).

B. The Varied Populations of Eastern Indonesia

The peoples of the eastern Lesser Sunda (Nusa Tenggara) and Moluccas (Maluku) Islands to the west of New Guinea clearly present great variation

(Plate 4). This is a result of a gradual Southern Mongoloid settlement, much of it historically recent, over the surviving western boundary of Melanesia. The phenotypic racial picture here is markedly clinal and there are few sharp boundaries. The eastern Lesser Sundas were described by Bijlmer (1929; see also Keers 1948), who reported clines in skin color, hair form, and the frequency of the epicanthic (Mongoloid) eye fold in populations from Sumba eastward to Timor. Basically, he regarded the Sumbanese in the west as "Proto-Malays" who are gradually replaced eastward through Flores and Timor by a dominant Melanesian population. Timor and adjacent islands also have interesting juxtapositions of Papuan and Austronesian languages.

The same situation occurs on the island of Halmahera in the Moluccas, although here there is another interesting situation. The Tobelo and Galela of the northern part of the island and of neighboring Morotai, who speak dialects of a West Papuan language, are described by Ishige (1980; see also Wallace 1962:249) as being basically of "Malay stock" with some Melanesian admixture. Because I am currently undertaking fieldwork in this area, I agree entirely with this viewpoint, which is confirmed by recent genetic research (Bhatia et al. 1995). This is clearly another example, like that of the Negritos, where races and languages do not match as might be expected when reasoning from pan-archipelagic patterns of human variation.

C. The Southern Mongoloid Populations

The Southern Mongoloid populations (Plates 5 through 9), now numerically dominant in the region, are all speakers of Austronesian languages, with the possible exception of some eastern groups such as the Tobelo and Galela mentioned above. All share considerable physical, cultural, and linguistic homogeneity despite the complex overlays of 2,000 years of Hindu-Buddhist, Chinese, and Islamic civilization. Coon (1966:181) describes them succinctly:

> These peoples are mostly short, with a mean stature for males between 157 and 160 centimetres; of medium build; yellowish or brown-skinned; mostly straight haired.... Among most of them the Mongolian eye fold is rare. Like the Australoids, many of them have large teeth.... They represent a more or less stable mixture between Mongoloid and Australoid elements, with local variations.

A greater degree of Australo-Melanesian inheritance can perhaps be seen amongst those populations that were once called Proto-Malays, as opposed to the Deutero-Malays who are still considered by some authors to represent a second and later migration into the region (e.g., Glinka 1978, 1981). The so-called Proto-Malays included many inland peoples of the larger islands of Indo-

nesia and the Philippines and of course some of the peoples of the clinal region of eastern Indonesia. Since Mongoloid gene flow has been entering Indonesia throughout historical times, it is clear that the so-called Deutero-Malays, who are basically the populations that inhabit the more accessible areas, have simply had more contact with the Asian Mongoloid world.

If it is possible to state the situation for Indonesia simply, then one can say that a Mongoloid phenotype predominates in the west and north and gradually fades southward and eastward (see also Bellwood 1978:304). In eastern Indonesia, a population that is quite clearly a part of the Melanesian physical and cultural world predominates. A model of Mongoloid expansion into an Australo-Melanesian sphere, allowing for considerable variation within each group, should suffice to explain the picture. The intricate details may always escape us, for the terms *Australo-Melanesian* and *Mongoloid* themselves are idealized models, and the Southeast Asian area may have been a clinal zone between these idealized types for many millennia.

D. Skin Pigmentation and the Southern Mongoloids

Anthroposcopic traits are poorly understood in terms of genetic inheritance, but it is believed that many of them have complex polygenic bases; hence they are not subject to rapid phenotypic fluctuations caused by genetic drift. Skin pigmentation is one such trait, and the existing variations must have evolved over long periods owing to the action of natural selection in specific environments. It seems reasonable to assume that skin color among members of an undisturbed population in a relatively stable environment will remain stable over very long periods of time. From known cases of population expansion, it can be seen that the processes of natural selection that cause skin pigmentation to vary work at very slow rates. For instance, the tropical American Indians are not reported to be noticeably darker than other Native Americans after a settlement period of perhaps 15,000 years (Brues 1977:302), and yet it is clear from Old World observations that tropical latitudes have certainly selected for darker skins over much longer time spans. These observations suggest that human skin color variation is of great antiquity and that the geographical variants seen today commenced development in original homeland environments from the beginning of the Old World radiation of anatomically modern humans.

Skin pigmentation is mainly produced in the deepest layer of the epidermis by melanocytes that produce the black and brown pigment called melanin. The visible color is also affected by the thickness of the outer skin layer, or *stratum corneum,* which contains keratin. These factors do not vary congruently; African and Melanesian skins are characterized by dark pigmentation but little keratinization, Mongoloid skins have a thick stratum corneum packed with keratin but

little pigmentation, and European skins lack both pigmentation and keratin. Indeed, human skin colors are formed by the actions of several factors that seem to vary rather independently.

The environmental factors that promote variation in skin pigmentation are still poorly understood. Although many authorities (Krantz 1980; Tasa et al. 1985; Robbins 1991) are willing to accept some latitudinal correlation for skin color as a barrier to the penetration of ulraviolet light (i.e., dark at the equator, lighter toward the poles), there are many explanatory variations on this theme. For instance, Brace (1964) suggested that the fair skins of higher latitudes developed in part because the wearing of clothing circumvented those selective pressures that constantly promoted the production of protective melanin amongst our universally dark-skinned ancestors. Loomis (1967) adopted another explanation, which Brace had rejected: the synthesis of vitamin D by sunlight in the skin. Humans need a balanced quantity of this substance and too much or too little is dangerous, the latter causing skeletal deformation, or rickets. Loomis suggested that human skin is pigmented so that just enough sunlight can penetrate: Dark skins protect from too much, light skins protect from too little in high latitudes where sunshine is weaker.

The conclusion that can be drawn is that skin color is of complex causation, perhaps determined by three to five allelic pairs of genes (Baker 1992:47), and factors involved probably include all those listed above—which of course would vary in relative significance from one environment to another. The reason I have added this discussion, however, is to draw attention to the presence of the relatively light-skinned Southern Mongoloid population in the Indo-Malaysian tropics. It exists in a latitudinal belt that in all other regions of the Old World (Africa, southern India, Melanesia, northern Australia) supports much darker aboriginal populations. Although Southern Mongoloids are darker than Northern Mongoloids, and there is a clear north-south cline in skin color that is even visible within Southeast Asia, I find it hard to escape the conclusion (as also does Brace 1980a) that had the Indo-Malaysian groups evolved entirely within the archipelago, they should be as dark as the latitudinally neighboring Melanesians and Negritos. There is a clear case here of a pattern that does not meet the demands of long-term local natural selection, just as there is in the American tropics.

II. GENETIC AND CRANIAL DATA ON THE DIFFERENTIATION OF INDO-MALAYSIAN POPULATIONS

When this section was prepared for the first edition of this book, the science of genetics was still making only modest progress in the study of human racial ancestry. In the decade since, there have been such mighty strides in the devel-

opment of methods for analyzing the sequences of actual nucleotides in nuclear and mitochondrial DNA that we are undoubtedly on the threshold of an out-pouring of new data on the remote ancestries of living human populations. To summarize this new material is a daunting task, but so far relatively little of the research has been applied to Southeast Asian populations. For Pacific popula-tions there have been some major advances in recent years, particularly in the identification of population-specific lineages in mitochondrial DNA (Hill and Serjeantson 1989; Chen et al. 1992; Lum et al. 1994; Hagelberg 1994; Melton et al. 1995; Redd et al. 1995). Within Southeast Asia, mitochondrial DNA research has recently shown the importance of southern China as a major region of human radiation and also the apparent survival of Australo-Melanesian mtDNA lineages in small numbers of people in Malaysia and Indonesia (Ballinger et al. 1992). It has also been noted above how a very high proportion of Philippine Negritos have a 9-base-pair deletion in mitochondrial DNA that seems to link them with Mongoloid populations, although new research is showing that this deletion phenotype is associated with many separate lineages in terms of nucle-otide substitutions, so the situation might not in reality be very simple.

In the remainder of this section I will retain the basic structure used in the first edition of this book in 1985, with any necessary updating. Therefore, I will test my generalizations about ultimately separate origin zones (despite the pos-sibility of some geographical overlap) for the Australo-Melanesian and Southern Mongoloid populations against data on genetically controlled characteristics. The following discussion is concerned mainly with polymorphic characteristics identifiable in blood, rather than in nucleotide sequences within actual DNA.

At all comparative levels, from two related individuals to whole populations, the human species presents a complex genetic picture of uniqueness, intergra-dation, and identity, depending upon which genetic characters are under study. The most important ones for charting human prehistory have always been the genetic polymorphisms—systems that can have several states depending on the occurrence of different alleles at specific genetic loci on the chromosomes. The best known of these polymorphisms are perhaps the blood groups, which are of simple inheritance based on variation at only one or a few loci. Some years ago it was commonly believed that pooled blood group frequencies could be used to trace ancestries of specific populations and even major races of mankind. How-ever, it is now known that some blood groups are subject to natural selection over both large and small geographical areas, and among small isolated popula-tions they are particularly susceptible to genetic drift and to a nonrandom sam-pling process known as the *founder effect* (Neel 1967). Selection, drift, and the founder effect do of course operate to produce variation in all genetic systems, but some are more resistant to rapid change than others. Those blood groups (such as ABO and Rh) that can change rapidly in frequency in both time and

space are of little use in tracing ancient connections between the major racial groups of mankind (Simmons 1962, 1976), and their patterns of frequency around the world do not correlate with the distributions of the modern races (Krantz 1980).

In recent years, however, there have been major strides forward in other methods that allow major human populations and races to be "characterized." One important method involves the comparison of populations in terms of their unique alleles and allele combinations (haplotypes), many of which are specific to particular geographical races.

A. Evidence from Population-Specific Genetic Markers

The genetic systems that are of most use for tracing population origins and ancient connections are those not markedly susceptible to natural selection and resistant to local fluctuation through genetic drift. In other words, single alleles or haplotypes in these systems are considered likely to remain in a population through long periods of time and through long migrations. Where they are distinctive to a particular population and do not occur in others, they can be of great interest for human prehistory. Genetic systems that are strongly subject to disease-associated natural selection, such as the abnormal hemoglobins, do not have those advantages and are not considered here.

There are now known to be a number of fairly stable genetic polymorphisms, apparently unassociated with disease resistance, that do have population-specific variants. Relevant summaries for all these polymorphisms are given by Kirk (1982; 1986), who demonstrates that Asian and American Mongoloids (including Indo-Malaysian Mongoloids) can be differentiated from Australians and Melanesians on sharp presence-absence occurrences of variants in the Diego red cell antigen system, the transferrin iron-binding serum proteins, the Gm immunoglobulins (Kelly 1990), and the Gc serum protein system. This evidence provides very strong support for the view that the Australians and Melanesians are of reasonably close common origin and are quite sharply separated in many characteristics in blood genetic systems from the Southeast Asians.

### B. Evidence from Multivariate Distance Statistics

This evidence comes from two sources—phenotypic measurements (anthropometric and cranial) and gene frequencies—and studies have tended to be at two levels, one stressing major population affinities and the other being more concerned with microevolutionary patterns of divergence. Anthropometric and cranial distance studies have been confined mainly to the Australian and Oceanic regions (e.g., Howells 1970; 1973a; 1989; Pietrusewsky 1984), and as

the results do not really contradict those from genetic analyses, I will not consider them here in detail. However, recent analyses of broad geographical coverage by Pietrusewsky (1984; Pietrusewsky et al. 1992), based on a multivariate analysis of thirty-four cranial measurements on skeletal populations, do reveal a sharp level of differentiation between Australo-Melanesian and Mongoloid populations (Fig. 3.1).

Distance diagrams for Southeast Asian and Pacific populations in terms of genetic systems occurring in blood have been presented with increasing frequency since 1973 (e.g., Schanfield in Howells 1973b:76). Most analyses support the evidence given in the section on unique alleles, but this type of analysis has only very recently been extended into Southeast Asia proper. Schanfield (above) reported clear separations between Northern Mongoloids, Southern Mongoloids, and Papuan-speaking Melanesians, but only for five polymorphic loci. Recent studies have used up to twenty-nine loci (Nei and Roychoudhury 1993), and here the results seem to be in basic agreement; they may be summarized as follows:

a.   Australians and Melanesians are always more closely related to each other than either is to Southern Mongoloids;

b.   Oceanic Mongoloids (Micronesians, Polynesians) group most closely with Southern Mongoloids in Island Southeast Asia (see Hill and Serjeantson 1989);

c.   Southern Mongoloids as a whole tend to group closer to Northern Mongoloids (Chinese, Koreans, Japanese) than to American Indians (Nei and Roychoudhury 1993). However, the recent massive worldwide comparison of gene frequencies by Cavalli-Sforza et al. (1994) posits a fairly major separation between Northern and Southern Mongoloids, a separation that is difficult to reconcile with linguistic and cultural data. This is not an issue of direct concern for this book.

Apart from the one last mentioned, these patterns of similarity and difference are clearly unsurprising in the light of the data from the unique genetic markers. It may be asked what further information can come from this kind of research if the results always seem to replicate themselves within broad limits. Perhaps only the future holds the answer to this question, but it is worthy of note that some scholars are quite capable of putting forward new hypotheses that seem to conflict with old ones. For instance, Brace et al. (1991) have suggested, from an analysis of craniofacial evidence, that Polynesians derive from an Ainu-like population in Jomon Japan rather than from Neolithic Southeast Asians, a conclusion that clearly goes against all archaeological and linguistic evidence relevant for this question. So far, this hypothesis has not received much support from other biological analyses.
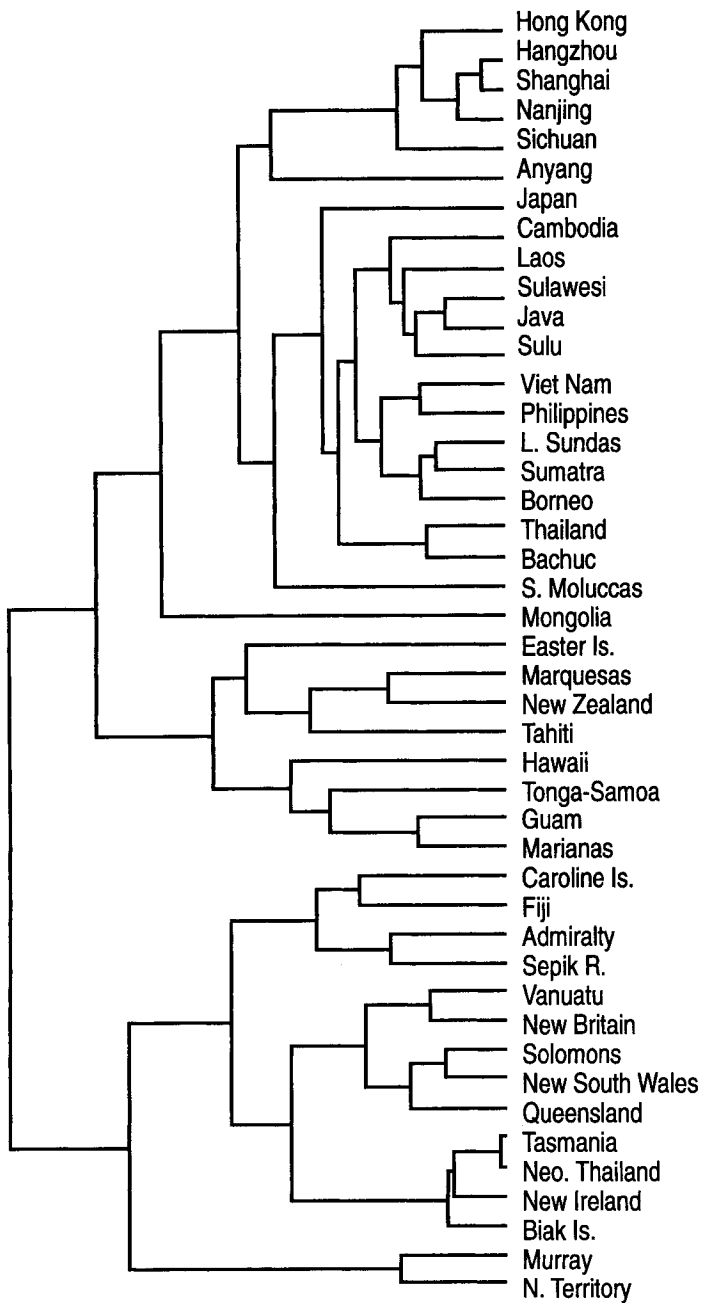
Fig. 3.1 Diagram of relationships for Southeast Asian and Pacific populations based on a multivariate cluster analysis using thirty-four cranial measurements on samples of male skulls. The upper major branch includes samples in eastern Asia and Polynesia/Micronesia; the lower branch includes samples from Melanesia and Australia. Courtesy: Michael Pietrusewsky.

Other scholars have been experimenting with information concerning rates of genetic mutation over time to see if specific distance measurements between populations can be correlated with times of separation between them. For instance, Omoto (1981) has suggested from inferred rates of mutation that two groups of Philippine Negritos have been separated from each other for over 10,000 years. The results of such "molecular clocks" are very hard to evaluate, partly because such methods depend on other disciplines for the provision of a basic timescale against which to calibrate the genetic distances.

C. Smaller-Scale Population Distances

As well as the attempts to characterize major populations, there have been many attempts in recent years to see how small neighboring populations differ from each other genetically and to see if these differences vary congruently with linguistic differences, rates of intermarriage, geographical distances, and patterns of variation in anthropometric features. Again, almost all of this work has been done in Australia and Melanesia (together with South America), and the results as presented are clearly of more interest to geneticists and ecologists than to prehistorians (e.g., Birdsell 1993:443–446; Friedlaender 1987; J. Wood 1978; Serjeantson, Kirk, and Booth 1983; Stoneking et al. 1990). They are of interest for intensive studies on how genetic variations develop within small isolated populations over time spans of only a few generations, and they can inform about the true genetic significances of language barriers and patterns of intermarriage (for a European example indicating the high genetic significance of local language boundaries, see Barbujani and Sokal 1990).

The genetically varied Melanesian gardening populations are of great interest in this regard, and similar patterns of great local variation characterize some isolated groups of hunters and shifting cultivators in Southeast Asia (see Polunin and Sneath 1953; Lie-Injo 1976; Fix 1984). These are situations where genetic drift can operate at rapid rates, but there always seems to be an encompassing anthroposcopic stability, probably maintained by selection, that not even drift can overcome. I would think that the main interest of these studies for a prehistorian comes from the demonstration that rapid genetic microevolution at identifiable genetic loci, over a period of perhaps 40,000 years across a range of temperate and tropical environments in Australia and New Guinea, has been insufficient to produce major phenotypic differences equal to those we see in the major Australo-Melanesian and Mongoloid divisions today. This brings me back to the observation that the Southeast Asian Mongoloid populations have probably not evolved entirely in the tropical latitudes they now inhabit.

III. ANCIENT POPULATIONS OF *HOMO SAPIENS* IN THE INDO-MALAYSIAN ARCHIPELAGO

From the genetic information on modern populations presented above, it would seem reasonable to hypothesize—given patterns of trait distribution—that the ancestors of the Indo-Malaysian Mongoloids have moved southward into a region previously settled by Australo-Melanesian populations. The two groups have since hybridized to varying degrees. The diachronic data from ancient skeletal remains should, in theory, allow evaluation of this hypothesis. In practice, however, skeletal remains tend to be fragmentary, often quite poorly dated, and ambiguous in terms of racial correlations. All human populations intergrade, especially in skeletal characteristics, and statements about the affinities of particular crania tend to be probabilistic (older reports often claim more certainty than is now known to be reasonable). While the totality of evidence does suggest that the Southern Mongoloid distribution can only be explained by allowing some importance to expansion, the whole story is complex; we certainly cannot see a clear-cut replacement of populations taking place in the skeletal record. We must allow for intermarriage, local evolution, and also for the important concept that expansion involved more a change in the structure of a Mongoloid-Australoid cline than a migration of uniform and distinct peoples from a remote area such as China.

A. Regional Continuity or Replacement *(erectus* to *sapiens)* in Australo-Melanesian and Mongoloid Evolution

As noted in Chapter 2, some paleoanthropologists today continue to believe that the *Homo erectus* populations represented by the skeletal series from China and Java have passed on at least some of their locally distinctive morphological characteristics to the present Mongoloids and Australo-Melanesians. This view has a respectable history of support going back to such influential scholars as Weidenreich (1946) and Coon (1962). According to Coon (1962:ix): "A species which is divided into geographic races can evolve into a daughter species while retaining the same geographical races." Coon did come under serious attack from reviewers for his claim that different geographical races crossed the *sapiens* threshold at different times (Coon 1962:30), but the basic idea that geographical racial differences have been maintained through long periods of human evolution has continued to receive support by Wolpoff and Thorne (e.g., Wolpoff 1985; Thorne and Wolpoff 1992; Wolpoff et al. 1994) for the Australoids and by the same and most recent Chinese authors for the Mongoloids.

   On the other hand, as described in detail in Chapter 2, the past decade has seen a considerable growth in the proportion of scholars who favor a relatively

recent radiation of anatomically modern humans from an African source, perhaps within the past 100,000 years. This view now has a great deal of genetic and craniometric support, and I will not repeat here the previous discussion. When this book was first published in 1985, I accepted the hypothesis of regional continuity. Now, of course, the matter is not so simple. The skeletal evidence from Southeast Asia is too fragmentary and poorly dated to be of central value for resolving this debate, and I see little benefit here in taking a strong stand on the issue. The question of population replacement *within* the time span of anatomically modern humans is, however, one that must be considered in more detail. It lies at the heart of debate about the origins of current biological patterning within the human populations of Southeast Asia and western Oceania.

B. The Southern Mongoloid Replacement Model for the Indo-Malaysian Archipelago

The oldest skeletal remains thought to be directly in the ancestry of the Southern Mongoloid populations (together with other related groups such as the ancient Jomon and modern Ainu populations of Japan) include the four partial skeletons dated to ca. 20,000 years ago from a limestone fissure at Minatogawa on the island of Okinawa (Suzuki and Hanihara 1982; Baba and Narasaki 1991) and, from southern mainland China, the late Pleistocene skulls from Liujiang in Guangxi and Ziyang in Sichuan (the latter perhaps dated to ca. 35,000 BP; Wu Xinzhi 1996). The Liujiang skull is of great interest: Coon (1962:469) described it as Mongoloid with some Australo-Melanesian features (see also Thorne 1980a:100). This may be telling evidence for the existence of a late Pleistocene clinal zone through Southeast Asia—an area where such a cline may be expected as there are no major latitudinal barriers to gene flow.

For Australoid evolution in the tropical latitudes of Southeast Asia, the record is less complete than that for China because the majority of the relevant specimens date after 30,000 years ago and have been found in Australia; they will be returned to briefly in Section IIID. However, scattered material, mostly postdating 25,000 years ago, is known from various parts of Southeast Asia. Some of the important sites are the caves of Niah and Gua Cha in Malaysia, Tabon Cave in the Philippines, and a scatter of important cave and shell midden sites in Indonesia (for site locations see Fig. 3.2 and Chapter 6, Fig. 6.1).

Niah Cave (the West Mouth) in Sarawak is a major site that will appear frequently in this book; for present purposes, it has by far the best series of dated human remains of any site in Island Southeast Asia, and these include:
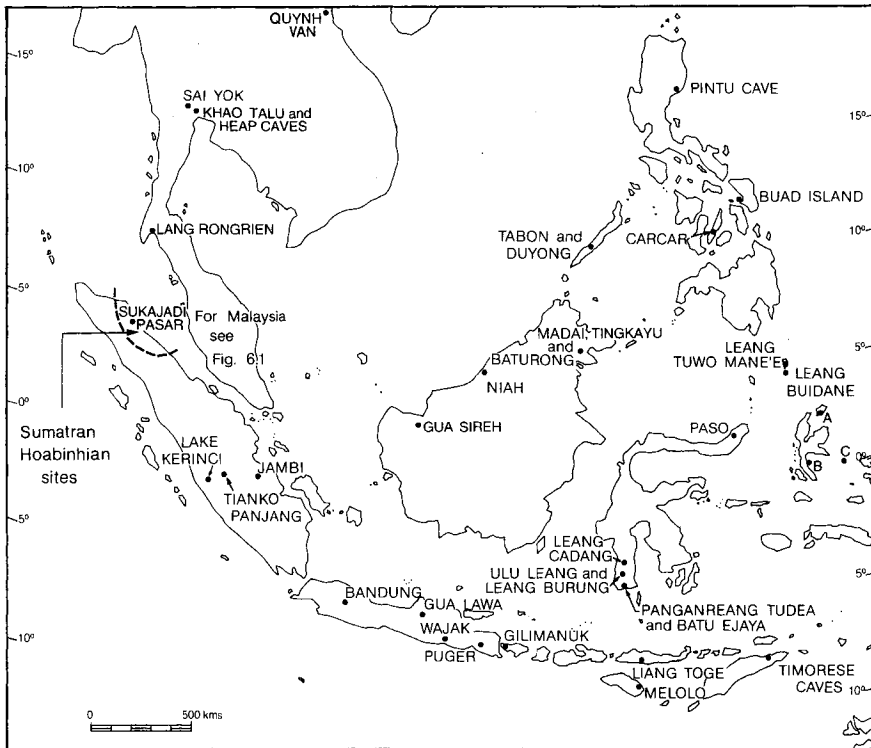
Fig. 3.2 Locations of sites referred to in Chapters 3 and 6. A = Tanjung Pinang and Daeo, B = Gua Siti Nafisah, C = Gua Golo and Gua Wetef.

a.   The "deep skull" (Plate 10) (Kennedy 1977), generally associated with a carbon date of ca. 40,000 BP, although my inclination is to prefer a younger date on the grounds that the skull must have been buried from a higher level (see Chapter 6, Section IIA).

b.   A series of flexed, seated, and fragmentary burials dating between 14,000 and 3,500 BP (Harrisson 1975b; Brooks et al. 1977).

c.   Extended burials in coffins or mats dating from possibly 2000 BC to less than 2,000 years ago (Chapter 7, Section IIID).

The situation with respect to the deep skull has been reviewed by Kennedy (1977). The basic analysis of the skull was done by Brothwell (1960), who suggested that it belonged to a young person whose closest morphological affinities were with recent Tasmanians; that is, toward the gracile end of the Australo-Melanesian range of variation. The burial series listed under b has not been

fully described, but Brooks et al. (1977) provide data on blood groups identified from the bones, and Koenigswald (1958) described the dentitions of the older burials as "Melanesoid." Perhaps all that can be said about this group is that its affinities do not appear to be with the recent Southern Mongoloids, who are more probably represented in group c.

From Tabon and nearby caves on Palawan island in the Philippines, there are two sets of human remains (Fox 1970):

a.   A frontal bone and mandible from Tabon Cave dated between 20,000 and
      22,000 BP (although the relevant deposits are described as disturbed; Fox
      1970:40). The mandible was considered close to the Australian range by
      Macintosh (1978).
b.   Jar burial remains in many caves, all postdating 3,000 years ago and all
      Mongoloid in terms of incisor shoveling (Winters 1974).

Thus, in both Niah and the Tabon Caves there is some evidence, albeit debatable, for postulating that an Australo-Melanesian population formerly existed in regions occupied by Southern Mongoloids since at least 1000 BC. For Gua Cha the situation is a little different. This site is a rock shelter in Kelantan in central Peninsular Malaysia, a region now inhabited by *orang asli* (aboriginal) groups of hunter-gatherer Negritos and agriculturalist Senoi; the former being of clear Australo-Melanesian affinity but the latter belonging to a population that has genetic affinities with Mon- and Khmer-speaking populations (Saha et al. 1995). The twenty-seven burials from Gua Cha date from about 10,000 years ago to perhaps 2,000 years ago (Sieveking 1954; Adi 1985; see also Chapter 6, Section IA; Chapter 8) and span both Hoabinhian and Neolithic contexts. Trevor and Brothwell (1962; see also Bulbeck 1982) note that the remains show no change of a racial nature throughout and have general affinities with Melanesians. The Gua Cha remains must be ancestral to some of the present *orang asli*, especially the Semang Negritos, and possibly form part of the local Senoi ancestry as well. The latter, however, with their Mon-Khmer genetic affinities, surely have a predominant ancestry in Neolithic population movements down the Malay Peninsula from the north (Bellwood 1993). One is obliged to posit some degree of population replacement in the peninsula, even if it is not directly visible in the human remains from Gua Cha itself.

Since the first edition of this book was published, other skeletal remains of claimed Australo-Melanesian affinity have been recovered from Hoabinhian contexts in the caves of Gua Gunung Runtuh in Perak, Peninsular Malaysia, and Moh Khiew in Krabi Province, southern Thailand. The Gunung Runtuh skeleton (Zuraina, ed. 1994) is of a middle-aged male with a deformed left arm and hands, buried in a squatting position with knees drawn up to his chin. Freshwater shells with the skeleton have been Carbon-14 dated to about 10,000 years

ago, and the morphology of the individual is within the Australo-Melanesian range. The burials from Moh Khiew Cave appear to be of Australo-Melanesian morphology and to come from Hoabinhian contexts, but only a provisional report is available (Pookajorn 1994). Unlike the series from Gua Cha, however, these samples are small and do not span long time periods.

To fit the information from these sites into a coherent pattern for the Indo-Malaysian Archipelago, we must turn to Indonesia. Most of the important material has been reviewed by Jacob (1967a), but more has been recovered in recent years. First I will consider the most problematic site: Wajak in east-central Java, where two crania were found in 1888 and 1890 (the latter by Dubois) in a now-destroyed shelter from which there has survived no direct evidence for date or context (Storm and Nelson 1992). Fortunately, however, it has recently been possible to subject a human femur from the site to bone apatite Carbon-14 dating (Shutler et al. 1994), with a result of about 6,500 BP. Thus the Wajak human and animal bones can probably all be considered early to mid-Holocene.

But the Wajak crania still raise questions of interest. They have been considered Australo-Melanesian by many authorities and have large brains and faces, but both Coon (1962) and Jacob (1967a) have also noted possible Mongoloid affinities in their flat faces. If the above date is correct, it may be that the Wajak skulls indicate some degree of Mongoloid affinity for Javan populations prior to the period of Austronesian colonization. Unfortunately, the precise morphological affinities of these skulls appear to be obscure owing to problems with reconstruction, but if they are indicative of pre-Austronesian gene flow from mainland Asia into Indonesia, they are of great significance. This latter view was partly espoused by Jacob (1967a:51–52), who considered the Wajak population as possibly ancestral both to Indonesian Mongoloids and to present Australo-Melanesians. I will consider the evidence for this view in the next section, as it has been promoted again recently.

The other Indonesian skeletal remains fall into three rather vague groups:

a.   Skeletal remains from several sites on Flores, all presumed to be of Holocene date and clearly belonging to the ancestors of the present mainly Australo-Melanesian population of the island. One adult female of very small stature from a cave called Liang Toge has been dated to ca. 2000 BC (Jacob 1967a:79). Skeletal remains dating from ca. 2,000 years ago recently excavated from the rock shelter of Tanjung Pinang on Morotai Island, north of Halmahera, appear also to have generalized Australo-Melanesian affinities (Bulbeck, pers. comm.). In these easterly regions of Indonesia, still peopled by groups with quite strong Melanesian biological affinities today, such observations are not surprising.

b.   Cranial remains of Australo-Melanesian affinity from regions of northern
     and western Indonesia that are today inhabited by Southern Mongoloids.
     The best examples in this group include the large-toothed cranial remains
     from the cave of Gua Lawa in central Java (Jacob 1967a; Mijsberg 1932);
     the twelve disturbed skeletons from a destroyed Hoabinhian shell midden
     at Sukajadi Pasar in northern Sumatra (Budhisampurno 1985); and the
     skull from the basal levels of Leang Buidane in the Talaud Islands (Bulbeck
     1981). None of these samples is directly dated (although the Sukajadi
     midden has marine shell from a disturbed context dated to ca. 7,500 BP;
     Bronson and White 1992:508), but all clearly predate the early Metal phase
     with its associated Southern Mongoloid populations.
c.   Skeletal material, mostly postdating 1000 BC (i.e., later Neolithic onwards),
     that is clearly of Southern Mongoloid affinity, particularly on such criteria
     as shoveling of the incisor teeth. Material of this type is very widespread;
     good samples come from Leang Cadang in southern Sulawesi (Jacob
     1967a), Gilimanuk in Bali (ca. 2,000 years old, Jacob; 1967b), and Leang
     Buidane in Talaud (first millennium AD; Bulbeck 1981). In all these cases
     the populations are clearly ancestral to the present inhabitants of these
     regions.

Taking this skeletal material at face value, as described in the literature, the
most likely hypothesis is that Southern Mongoloid populations have entered
the archipelago from the north, mainly via the Philippines as far as Austrone-
sian expansion is concerned but perhaps also via the Malay Peninsula to some
extent as well, and have been present since at least 1000 BC in most areas where
they are now found; they have clearly never penetrated in any major way into
Irian Jaya and adjacent parts of eastern Indonesia. Again accepting old reports
at face value, the presumed clinal effects of this expansion in such post-1000 BC
populations as those from Melolo in Sumba (Snell 1948) and Puger in eastern
Java (Snell 1938) can also be seen.

   Let me expand this replacement hypothesis further by describing how it has
fared at the hands of authoritative past supporters and how it may relate to his-
torical trends and events. Perhaps the simplest and clearest statement of the
replacement view was published by Barth in 1952; he thought that late Neo-
lithic and Bronze-Iron Age populations had been pushed southward out of China
by population pressure a little before 500 BC. For some reason he believed that
there was a sharp ecological barrier between South China and Southeast Asia
that Mongoloid populations were unable to cross until they had developed sub-
stantial populations with wet-rice agriculture, after which they dramatically
burst over the barrier. Such sharp replacement is not supported by the skeletal
record, Barth's dates for initial Mongoloid expansion are far too late, and his

view that North China was the ultimate source for all biological and cultural innovations in Southeast Asia is now known to be wrong. But the basic need for a hypothesis of replacement still remains; indeed, the linguistic evidence for Austronesian dispersal (Chapter 4) makes it unarguable to a certain degree.

As far as the opinions of biological anthropologists are concerned (Barth is a social anthropologist), the basic view of Coon (1962, 1966) was likewise that Indonesia and adjacent parts of the Southeast Asian mainland formed the Australoid homeland, overwhelmed by a "great rush" of Mongoloid expansion southward, commencing by at least the Neolithic and culminating in historical times within the past 2,000 years. Coon (1962) also reviewed the early Holocene skeletal material from Mainland Southeast Asian Hoabinhian sites, and there are indications here of a confusing array of Mongoloid and Australo-Melanesian features stretching from northern Vietnam (e.g., Cuong 1986-1987 for Mai Da Nuoc, ca.10,000 BP; Duy and Quyen 1966 for Quynh Van, ca. 6,000 BP) down to Peninsular Malaysia (e.g., Jacob 1967a for Guar Kepah). My own tendency is to regard this pre-Neolithic material as basically clinal between present Australo-Melanesian and Southern Mongoloid foci of variation. For the Asian mainland north of Malaysia, it is not really known when the ancestors of the present Mongoloid populations first began to establish themselves; in the northern part of the region and southern China they may always have been predominantly Mongoloid. For more southerly regions it is probable that Southern Mongoloid expansion was taking place during the Neolithic and early Metal phases, if not before, and linguistic and historical sources suggest that considerable expansion of such groups as the Thais, Vietnamese, and Malays has affected vast areas of the mainland since 3,000 years ago.

A more recent variation of Coon's basic viewpoint has been presented by Howells (1973b, 1976, 1977, 1989), who defined (Howells 1973b) a late Pleistocene province of "Old Melanesia" comprising continental Sundaland, Wallacea, and continental Sahulland. Populations ancestral to modern Australians and Melanesians are stated to have inhabited this region since at least 50,000 years ago (as represented by the remains from Niah, Wajak, and Tabon), and the present Australians and Melanesians now represent the differentiated descendants of Old Melanesian ancestors. For the present day, Howells (1973b:192) defines a province of "New Melanesia," now flanked by the Southern Mongoloid populations who have settled Indonesia, Polynesia, and Micronesia, and regards all these expanding Southern Mongoloids as Austronesian speakers of post-3000 BC southern Chinese origin.

Another recent viewpoint in support of the postulated Southern Mongoloid expansion is that of Brace (1976, 1980a), Brace and Hinton (1981), and Brace et al. (1984; 1991). Brace has developed the hypothesis that a reduction of overall tooth size occurred with the development of agriculture. He suggests that the

Austronesian-speaking Southern Mongoloids (fairly small toothed) had expanded via the Philippines into Indonesia, where they replaced a larger-toothed population still represented by the Australians and Melanesians. Basic gradients in tooth size throughout the region, with the smallest in southern China and the largest in Australia and New Guinea, support this view. Brace and Hinton (1981) went on to stress the importance of soft-food preparation in containers such as pottery as a factor that could relax selection pressures favoring large teeth; pottery is absent in the New Guinea Highlands, although horticulture is of high antiquity there, and tooth sizes have remained large. Again, we are presented with a hypothesis that small-toothed Southern Mongoloids of southern Chinese origin have replaced a more macrodont population in Indonesia and the Philippines. Brace et al. (1991) have expanded this model further in terms of craniofacial evidence and here use the terminology of a "Mainland Asian Cluster" gradually replacing an "Australo-Melanesian Cluster" in population terms.

The views of Coon, Howells, and Brace outlined above are all generally in accord with my own, and I have taken ideas from all three before (Bellwood 1978). Not all authorities, however, present this same viewpoint of recent Mongoloid expansion and replacement. It is now time to turn to another view that may be correct in part and that may necessitate modification of basic replacement theories. This view is that many aspects of the present Southern Mongoloid phenotype have actually evolved within Southeast Asia from the late Pleistocene onward. No one would dispute that intense Mongoloid gene flow into the area has taken place in historic or even latest prehistoric times, but it may be that all the populations of eastern Asia were undergoing similar trends in terms of modernization of skull and facial form throughout the late Pleistocene and into the Holocene. Hence the postulated Southern Mongoloid migrants may have been settling amongst populations who were also evolving in similar ways and who may have contributed more to the present dental and cranial phenotypes of the region than is usually allowed.

C. The Indo-Malaysian Continuity Model

This model switches the emphasis strongly away from migration. It has a respectable pedigree, being foreshadowed by Weidenreich in 1945 when he pointed out that brachycephalization (a trend toward an increasing broadness of the skull) could have evolved locally in different populations—an important observation at a time when long skulls and broad skulls were thought to identify different migrating races. Hooijer (1950b, 1952) also pointed out that large teeth alone could not, as others had assumed, be used in the prehistoric Southeast Asian context to identify "Melanesoid" populations. This was not an attempt

to discount migrations (see Koenigswald 1952 for a spirited rejoinder based on a misunderstanding about this), and Hooijer was merely disputing theories based on teeth in isolation. He was able to show that reduction in tooth size could be a local development and need not necessarily imply a migration from outside by a separate small-toothed population.

In recent years the view of local population evolution within Southeast Asia has become more positive. Turner and Swindler (1978; and see also subsequent Turner references) suggested that late Pleistocene Sundaland was occupied by a population with widely shared dental characteristics that they termed "Sundadont". The present Southern Mongoloids are thought to have retained a Sundadont dentition from this ancestral Proto-Mongoloid population and hence to have developed in situ within Sundaland and adjacent parts of Mainland Southeast Asia. Polynesian and Micronesian dentitions are also within the Sundadont range, thus attesting to their Island Southeast Asian and Proto-Mongoloid origins. The "Sinodont" teeth of northeastern Asia and the Americas are also thought to have evolved from an original and more widespread Sundadont-like ancestral form. Melanesian teeth, which are placed in a separate class by Turner and Swindler because of their simplified crown morphologies and low percentages of incisor shoveling, are derived from the same Pleistocene populations that gave rise to the Sundadonts, but have evolved their own local form within Melanesia. Thus, this view suggests that Southern Mongoloids are indigenous to Southeast Asia and share a common late Pleistocene ancestry there with the Melanesians. Craniofacial evidence in support of this view, and contrasting with the above views of Brace, has recently been presented by Hanihara (1993).

Turner's current view (Turner 1987, 1989, 1990, 1992) is that Sundadonty is a basic human pattern and that modern humans have perhaps evolved and dispersed from a Southeast Asian homeland. I find it hard to challenge this view since it is presented without a timescale, although there is virtually no support for a Southeast Asian source for modern humanity in the archaeological record. However, Turner's hypothesis does have support from Kingdon (1993), who suggests that the dark pigmented populations of Africa, Australia, and southern India all originated from coastal hunter gatherers in Pleistocene Southeast Asia. This is an intriguing possibility that merits some consideration, although hard data in support may be difficult to find.

Unfortunately, Turner's analyses do not include any well-dated samples of southern Chinese Neolithic populations. This is important because the possibility arises that the Austronesian dispersal from southern China into Southeast Asia after 5,000 years ago simply represented one group of Sundadonts replacing or absorbing other Sundadonts. If this is correct, then continuity in tooth morphology alone may not be a direct reflection of continuity in actual human

populations; Southern Mongoloids and Australo-Melanesians alike within the Indo-Malaysian Archipelago might have had similar tooth morphologies throughout.

Can one really argue in such detail—either for or against major population movements—from teeth alone? Perhaps we are back to the objections made by Hooijer (1950b, 1952; see above), but from the other side of the fence. To counter this possibility, Bulbeck (1981, 1982) has considered the whole question of local evolution within Southeast Asia in great detail in order to provide stronger support for a continuity hypothesis. He sees the main problem as how to explain the obvious modernization that has taken place within Southeast Asian populations; are these changes due to clade (lineage) changes (i.e., to a Southern Mongoloid migration replacing an Australo-Melanesian population), or are they due to grade changes (i.e., modernization within a single in situ population)? To approach this problem, Bulbeck examined a large amount of Southeast Asian cranial material from the late Pleistocene through to Recent (including many of the remains listed above) and documented what appear to be continuous and unbroken trends throughout: occurrence of the Sundadont dentition; size reductions in teeth, faces, and palates; and a reduction of facial prognathism. On the other hand, there has been a recent increase in the occurrence of upper incisor shoveling, and this is of course a feature most developed in mainland Asian Mongoloid populations.

In his conclusions, Bulbeck stresses that there is nothing in the evolutionary record of recent Southeast Asians that *demands* a migration of Southern Mongoloids from the north. In the absence of a rigidly defined chronology for the remains, it is clear that the documented changes could be due to changes in clade, in grade, or in both. In terms of teeth, his conclusions parallel those of Turner and suggest that local evolution is at least as good a hypothesis as migration. But it must not be forgotten that these conclusions are drawn only from cranial and dental characteristics; in these areas alone it may be possible to regard Southern Mongoloids as the result of in situ modernization. But I think there is evidence from other sources—those not always considered by physical anthropologists concerned with skeletal remains—that must be considered. I have already mentioned genotype and such phenotypic traits as skin color, but in addition, linguistic evidence indicates that Austronesian speakers with agriculture have expanded throughout the Indo-Malaysian Archipelago and the Pacific Islands within the past 5,000 years; the modern Austronesians must to some degree be descendants of original founder populations that expanded from southern China and Taiwan, even if local genetic input has been considerable.

My own view runs something like the following. The ancient Indo-Malaysian Australo-Melanesians who remained in the archipelago as "cousins" to the descendants of those groups who settled Australia and New Guinea ca. 50,000

years ago clearly continued to evolve independently on the western side of the Wallacean sea barriers. Many of the changes they underwent were probably shared, to an extent, with more northerly Asian Mongoloid populations. In fact, there may have been continuously intergrading populations from southern China right into continental Sundaland—a clinal Mongoloid-Australoid zone evolving as one rather than two separate populations, but still spanning a suffi-ciently broad latitudinal zone for natural selection to have quite different results at either end.

This leads directly to the following conclusions:

a.   Australia and New Guinea were initially settled from the Indo-Malay-sian Archipelago, presumably the Wallacean end of it, by at least 50,000 years ago.

b.   Australians and New Guineans have since undergone independent differ-entiation, but still retain clear traces of their common origin.

c.   The Indo-Malaysian populations "left behind" after Australia and New Guinea were initially settled continued to diversify and underwent certain trends in facial and cranial gracilization in common with adjacent Main-land Southeast Asian populations. Some of these changes may have taken place as a result of Pleistocene gene flow from more northerly (ancestral Mongoloid?) populations, but I suspect that changes in local selective pressures, perhaps via undocumented cultural changes, may also have been important. These groups remained phenotypically as Australo-Mela-nesians, in some cases to the present (the Negritos and some eastern Indo-nesians).

d.   From 3000 BC onward, the Indo-Malaysian region was settled from the north by linguistically related and expanding populations of Southern Mongoloids—the Austronesian-speaking populations. The chronology of this expansion can best be reconstructed from archaeology and linguis-tics, and it was clearly well underway by about 3000 BC in Taiwan, by 2000 BC in the Philippines and eastern Indonesia generally (with Micro-nesians and Polynesians hiving off by 1500 BC), and by perhaps 1500 BC or later in western Indonesia. It should of course be remembered that all the evidence suggests that many of the present Southern Mongoloid pop-ulations of Indonesia and Malaysia also have a high degree of Australo-Melanesian genetic heritage.

D. The Australian Window

From the Australian region there are further implications that involve the Indo-Malaysian Australo-Melanesians. The most simple view of Australian origins

postulates that only one founder population ever reached the continent and that the patterns of variation in the ethnographic population are due to local selection, plus perhaps some minor later arrivals. This view tells little about human variation in Island Southeast Asia after the period of initial Aboriginal migration over 40,000 years ago, but it does find favor with a number of recent authorities (e.g., Macintosh and Larnach 1976; Howells 1976; Wolpoff 1980; Habgood 1986; Brown 1987).

A quite different view has been espoused for many years by Birdsell (1949, 1967, 1972, 1977, 1993). It involves three separate migrations that could each be of great potential significance for the Indonesian region were they to receive support. First, per Birdsell, came Negritos (or Barrineans) from an ultimate African source; this group has had a lasting impact in Melanesia, especially in New Guinea. Second came the Murrayians, from a possible Ainu-like source. Finally the Carpentarians of northern Australia arrived, from a possible southern Indian source. All these populations reached Australia from intermediate locations in Indonesia. In his most recent book, Birdsell (1993) has even ventured to give dates for these expansions: over 40,000 years ago for the Barrineans, ca. 20,000 years ago for the Murrayians, and ca. 15,000 years ago for the Carpentarians. The Barrineans are traced through the Niah and Lake Mungo skulls, the Murrayians through Liujiang, Kow Swamp, Keilor, and Wajak, and the Carpentarians would appear not yet to have ancient representatives (Birdsell 1993:23). Birdsell's belief that Australian variation does not derive from one single founder population alone has recently come back into favor, even if opinions are couched in different terms.

For instance, a view suggested by Brace (1980b) is that Australia was settled first by a large-toothed population, of whom ethnographic descendants survived in the southern part of the continent and in Tasmania. But the populations of the central and northern regions (Birdsell's Carpentarians?) have smaller teeth, and these groups are thought to descend from migrants who entered Australia later. Brace's view has a certain appeal, for it suggests that Australia was reached by successive Australoid groups from Indonesia, who—as noted above —were developing smaller teeth and faces through time.

Alan Thorne is currently the strongest supporter of the view that more than one colonization of Aborigines occurred in Australia. His views come quite close to those of Birdsell, except that he recognizes only two groups on the evidence of ancient skulls. The first is a gracile group best known from Lake Mungo in western New South Wales, where stone tools and associated dates of over 30,000 years ago have been obtained. The second group has a much heavier facial and cranial skeleton, with large teeth and faces that overlap in size with those of later *Homo erectus*. This second group is known to date between 9,000 and 12,000 years ago at Kow Swamp in Victoria, although the morphology

might suggest that its ancestors arrived in Australia long before that. Super-
ficially, these two groups could overlap with the Barrinean and Murrayian groups
of Birdsell, but Thorne's opinions on the affinities of specific fossils differ con-
siderably from those of Birdsell.

According to Thorne (1980a, b; Thorne and Wolpoff 1981; Sim and Thorne
1990), these two groups represent well-defined skeletal populations of quite
different morphology. His suggestions have very clear-cut implications for
Australo-Melanesian differentiation within the Indo-Malaysian Archipelago.
Thorne's theory is that the Kow Swamp population, plus other "rugged" skulls
from various parts of Australia, represent an initial settlement (not a secondary
one as suggested by Birdsell) by an Indonesian population derived from a line
leading back directly to the *Homo erectus* population of Ngandong in Java. The
other more gracile group, which is represented by the Niah, Wajak, and Tabon
remains in Southeast Asia, is thought to represent a second and probably later
migration from at least Indonesia, with the possibility of an ultimate Chinese
source. As Thorne has stated (1980a:100):

> Remains from sites in China, particularly at Liu-Kiang (Liujiang) and Chou-
> koutien (Zhoukoudian), suggest the possibility that the ultimate source of the
> gracile people of Australia and Indonesia is to be found there.

The implications of both Thorne's and Birdsell's views for the Indo-Malay-
sian archipelago as well as for Australia are considerable, for if they are correct
about a "Chinese connection" during the late Pleistocene, it may be unwar-
ranted to regard the Southern Mongoloids of the Indonesian region as entirely
the descendants of a population expansion confined only to the Neolithic and
later periods (i.e., confined to the period of Austronesian expansion). Seen in
this light, these views may come partly into line with the regional continuity
scenarios favored by Turner and Bulbeck. The Indo-Malaysian Archipelago has
never been isolated from mainland Asia in the period of modern humans, and
population movement, usually on a very small scale but with possibilities for
extensive radiation, has always occurred. The same applies to Australia, although
here the school of thought that proposes a single origin for all Aborigines seems
to be prevailing at the moment.

E. Some Further Observations

I will finally turn back to the views expressed earlier concerning cultural capac-
ity to support a major population expansion. Small groups of hunters and gath-
erers might be expected to expand under favorable circumstances, particularly
into suitable environments previously uninhabited, but major and rapid migra-
tions into territories already settled by groups with equivalent grades of techno-

logical and economic organization would be unlikely. The Australian case just described may be a significant and unusual exception if Thorne's interpretation is correct, but in overall support of the generalization it should be noted that studies in the 1950s on resettled Malaysian *orang asli* groups of forest collectors and recently acculturated shifting cultivators showed fairly clear evidence for decreasing nutritional health and increasing disease (Polunin 1953). Groups such as these, which have been adapting to highly specific local environments for millennia, do not take kindly to upheaval.

On the other hand, it is clear that groups longer adapted to a horticultural lifestyle focused on the partial creation of artificial environments can adapt to movement more easily; the ancestral Polynesians and Micronesians were clearly well adjusted to this strategy, and I suspect that the earliest Austronesian colonists of Indonesia were also. It is amongst these that we can surely find the most significant evidence for any Southern Mongoloid expansion into the Indo-Malaysian Archipelago that might have occurred. I will return to these questions in Chapter 7.

Concerning such pre-Austronesian or pre-Austroasiatic expansions of mainland Asian populations into the Indo-Malaysian Archipelago as might have been involved in an early but secondary colonization of Australia, one can only surmise. Research still has a long way to go in this region and many of the answers will always be elusive. But while it may be unwise to equate *entirely* the Southern Mongoloid phenotype now present in the archipelago with the linguistic evidence for the past expansion of Austronesian agriculturalists, I am prepared to state my belief that the correlation must be at a very high level.