

## ARCHAEOLOGY

THE archaeology of the Pacific regions has received scant attention. Very little evidence is available in any of the major areas except as the result of surface collecting and occasional discoveries *in situ*. Few important sites have been completely excavated, and stratified deposits seem to be very rare. The peculiarities in the contents of the cultures also have contributed to the difficulty of gathering data, for in many areas few types of specimens are made of stone, pottery is lacking or scarce and the more numerous objects of wood, bamboo and other perishable materials have disintegrated in the moist earth of the tropics. In most regions the findings of sites is an important problem in itself, for surface clues are concealed by jungle growths or are inconspicuous. In spite of these many difficulties, considerable evidence has been accumulated. Probably most of the important types of stone artefacts are already represented in the collections, and the general distributions of many have been fairly well determined. The chronological relationships of various types of artefacts have been indicated by distributional studies, and in the East Indies the dating of some of the very early cultures has been determined by geological cross-references. In the same area, the very late cultures can be correlated with written records and other datable evidence from the continent for approximately the last 2000 years. Elsewhere there are abundant ethnological accounts for the late appearances, but little direct evidence to indicate the time limits of the earlier cultures.

Since the entire region of closely spaced islands was within reach of early man and has been completely occupied at least from Late Pleistocene times until the present, we can expect that archaeology ultimately will provide the evidence of the sequence of cultures in all areas. At the moment, it is only in western Indonesia that the archaeological data are sufficient to indicate the general course of prehistory, and even in this area only a broad outline can be given on the basis of local evidence, although miscellaneous considerations and information from adjacent regions throw much light on various problems. Since some of the

early cultures spread as far as Australia and Tasmania, the chronological relationships of stone-working techniques, and of various implements, indicated by distributional studies on that continent, furnish evidence of some of the cultural changes which took place in archaeologically unknown New Guinea.

In so far as the areas to the east of the Pacific Moat are concerned, evidence of early cultures is not to be expected, for simple hunters and wild food collectors could not have made a living in these islands, and only people with advanced watercraft could have discovered and occupied them.

The prehistoric cultures of the world are traditionally grouped into a five-fold classification of Eolithic, Palaeolithic, Neolithic, Bronze and Iron Ages. These great divisions are distinguished entirely by their cultural characteristics and have no fixed relationship with time or space. In each are numerous individual cultures which are similar in their fundamentals but different in their details. Cultures representing all the major periods except the Eolithic are found in the Pacific regions even today; hence it is clear that in some places these ages have not yet ended, in other areas some have not yet begun. The dates of the beginnings and culminations vary greatly from area to area and must be determined by the facts in each.

In the Eolithic Age man utilized tools provided by nature in the form of whole and broken stones, and subsequently began to experiment with the manufacture of similar objects by smashing stones together. Eoliths made by man, like those produced by natural agencies, show no consistency in size and shape and indicate that the techniques of manufacture were not skillfully controlled, or that a concept of a standard form in tools was lacking.

The characteristics of the Palaeolithic Age are determined more by the hunting and wild food collecting activities than by the techniques and tools employed. However, since various methods of flaking stone originated in the hunting period, flaked stone implements are typical Palaeolithic specimens. These techniques and some of the implements are also found as holdovers in subsequent periods.

The primary features of the Neolithic Age are the cultivation of plants and the domestication of animals. These are usually accompanied by the manufacture of stone tools by grinding, as well as by flaking, the making of pottery, the use of the stone mill, bows and arrows and

various other traits, most of which seem to come into prominent use at one place or another at about the time man began to settle down to a sedentary life. There are no reasons why these particular technical principles could not have been developed in Palaeolithic times prior to the use of plants, for all of them are employed by hunting peoples today. However, when such traits are found in Late Palaeolithic horizons they usually are considered to have been borrowed from Neolithic cultures, as probably they were in most cases. The term Mesolithic is often employed to designate such "transitional" appearances, but its use is satisfactory only in those cases where the Palaeolithic actually has been succeeded by the Neolithic Age.

The Bronze and Iron Ages define themselves. In addition to the use of metal, each is characterized by various traits inherited from previous times.

These considerations indicate the difficulties encountered in attempts to classify archaeological material when only odd specimens and incomplete records are available, for similar types of stone implements and techniques and other artefacts may be associated with two or more of the major ages. Until the details of each culture have been determined, the problems of dating, chronological relationships and diffusions cannot be settled with assurance.

### INDONESIA

The prehistory of Indonesia is represented by all the major divisions from the Palaeolithic through the Iron Age. In the early periods, the individual cultures are still ill-defined, and in the later ones they are confused by the mass of detail and the varying time limits in the different islands. In the past, as at present, ancient cultures apparently survived in refuge areas long after neighboring districts had received later developments.

The details of the Palaeolithic cultures are poorly known. Large quantities of flaked artefacts have been found, as well as crude hand-axes and a few objects of deer antler. Since most are surface finds, their dating must await stratigraphical correlation. Nevertheless, there is sufficient correlative evidence to indicate that they are associated with the Recent geological period, as well as with Late and Middle Pleistocene deposits, and it seems likely that others belong to Lower Pleistocene levels. The time span of Palaeolithic cultures in western

Indonesia thus includes the periods of Solo Man, Pygmies, Australoids and late Negroids. The presence of artefacts in levels contemporary with *Pithecanthropus* has been suspected, but the evidence is inconclusive.

The Mesolithic cultures of Indonesia and the mainland are characteristically Late Palaeolithic in content, with occasional intrusive Neolithic traits such as simple stone grinding or pottery. The antiquity may vary from the approximate equivalent of the Early Neolithic in neighboring areas on the continent, to quite recent times in certain refuge locations. In Asia, similar but better defined cultures are variously designated as Basconian and Hoabinhian, and a clearer understanding of them may aid appreciably in the analysis of the situation in the islands.

Fragmentary skeletal remains of Negroid type found in some Mesolithic sites indicate that Negroids were still in the East Indies at the time Neolithic influences were diffusing into southeastern Asia. It seems likely, therefore, that the earlier Negroids who migrated eastward carried Palaeolithic culture with them.

The Neolithic Age is represented by several cultures, each of which presumably altered its content and distribution from time to time. Few sites have been excavated; hence the primary evidence consists of surface finds of polished stone axes and adzes and fragments of pottery. Various types of axes or adzes can be recognized and the differences in their distributions, as known at present, suggest that they came to the islands at different times and by different routes. On this basis, two primary cultures, the "Round Ax (or Adze) Culture" and the "Quadrangular Adze Culture", have been predicated, and a chronological relationship implied in the order given. Although not yet substantiated by stratigraphical records, such a division fits nicely with other evidence, for the earlier axes are typical of Melanesia, and the Stepped and Tanged varieties of the quadrangular adzes—which appear archaeologically in Celebes, Borneo and the Philippines—are characteristic of central and marginal Polynesia.

Very little information on Neolithic pottery is available, and until the chronological relationships of forms and decorations, and their associations with other traits, have been determined in various islands, it will be impossible to decide which features belong to the Neolithic and which to the Bronze Age. Pottery-making is generally lacking in modern

Indonesia, but seems to have had widespread but spotty distributions during the Neolithic and Bronze Ages. This situation is confusing in its wider implications, for pottery-making is practiced today, and is found archæologically, in many localities in Melanesia and western Micronesia, but is lacking in Polynesia, eastern Micronesia, and Australia.

Some scholars, on a logical basis, associate with the Quadrangular Adze culture pottery, agriculture (rice and millet), megalithic monuments, domesticated animals (pigs), the outrigger canoe and various other traits—as well as the Malayo-Polynesian languages), and assign 2500 B.C. to 1500 B.C. as the period of their arrival in the East Indies.

The Bronze Age arrived in Indonesia late in the first millennium B.C. It seems to be derived from the Dongson Culture of the continent, which originated in China in the seventh or eighth century B.C., spread to Indo-China within a few hundred years and ultimately reached Indonesia. There is some question whether the Bronze Age should be given a separate classification, for iron objects seem to be associated with it (at least during its final stages) both in Indo-China and the East Indies.

The bronze objects in Indonesia, as in Asia, include a wide variety of weapons. Outstanding in numbers are the celts, of which a few have been found as far east as Lake Sentani in New Guinea. The most impressive objects, however, are the bronze drums, which vary in height from miniatures of three inches to giants of six feet. Some are exquisitely decorated with geometric and naturalistic patterns, portrayals of wild and domesticated animals, birds, ceremonial activities and other scenes. Such information throws much light on derivations, for frequently it indicates that the decorations could not have originated in the areas where the drums were found. Many drums had obviously been imported from the continent. Bronze drums of a special type were still being manufactured in Alor in the nineteenth century.

Of special interest are the glass rings found in the Philippines and considered to belong to the Bronze Age. Similar objects of undetermined antiquity have been found by natives in New Guinea. Old glass beads also have come to light in New Guinea, Timor, Borneo, Flores and Sumatra. Their cultural associations have yet to be determined.

The Bronze Age presumably did not reach eastern Indonesia until well within the Christian Era. Similarly, the dates of its termination must vary considerably, for, as already indicated, bronze objects continued to be manufactured in some islands until recent times.

It is uncertain to what extent traders were responsible for the introduction of bronze objects—and subsequently of technical knowledge—into the East Indies and the Philippines. Toward the end of the first millennium B.C., Chinese political authority began to move southward, and it seems quite likely that Chinese merchants were already established at that time throughout southeastern Asia and possibly in the major islands of Indonesia. The Bronze Age and the period of Chinese influence may, therefore, have been largely contemporary. But it is questionable whether the Chinese merchants themselves visited the eastern islands of the Indies until much later times. At least Chinese literary sources indicate only a fanciful knowledge of the region to the east of Java until late in the first millennium A.D., although it should hardly be expected that much practical information about distant areas would have reached the Chinese centers of learning.

Chinese merchants apparently maintained their position in the western islands continuously and were thoroughly entrenched when the Europeans arrived in the sixteenth century; but there are no indications that they had penetrated Melanesia, Micronesia or Polynesia. In recent centuries they have established themselves in all parts of the Pacific.

Chinese influences in Indonesia, both in early and late times, have been confined to the introduction of material objects and the designs—and possibly the techniques—associated with them. Many bronze objects and porcelains eventually found their way to the most inaccessible tribes, and the mountain peoples who possess them today regard them as precious heirlooms of unknown origin which have been handed down generation to generation since time immemorial. The presence of Chinese objects in the archaeological deposits of distant islands, therefore, does not necessarily mean that they were brought there by Chinese. Malay traders, met by the Chinese at Makassar in recent centuries, have carried their wares to Timor and beyond, and their ancestors may have been inter-island merchants even before the Chinese arrived in the western islands.

The date of the beginning of the Iron Age in Indonesia is not clearly indicated. The use of iron may be partially correlated with the Bronze Age, but if so this metal was unimportant until well within the Christian Era. Whether the Iron Age preceded or was contemporary with the Early Hindu Period depends, therefore, on the criteria selected for the definition of each. Some Indian traders may have arrived in Sumatra

as early as the first century A.D. There is no doubt that the Hindus in later centuries were responsible for the intensive use of iron, various iron-working techniques and many objects of iron. The Iron Age is represented in the Philippines, where it may have been derived in part from Assam, and in Central Indonesia. The dates of its introduction into these areas have not been determined, but it seems clear that they probably fall well within the Christian Era, subsequent to the exodus of the earliest Polynesians.

### AUSTRALIA AND TASMANIA

Very little is known of the prehistory of Australia and Tasmania from direct evidence. Few sites have been excavated in Australia, and none of significance has been investigated thoroughly in Tasmania. On the continent, artefacts have not yet been found in Pleistocene levels. In Tasmania, a few specimens seem to be associated with Pleistocene deposits, but the possibility of intrusion from later levels must be admitted.

The character of the lithic industries in the two areas is well established by an abundance of specimens. Furthermore, in Australia all the techniques employed are still practiced today. The chronological relationships of these techniques and of various types of specimens are indicated by distributional studies and diffusions going on at the present time. Since New Guinea is located on the route from Indonesia to Australia, it is clear that the antiquity established for various traits in Australia indicates a somewhat greater antiquity for similar appearances in New Guinea.

Tasmanian specimens belong entirely to the flake class, and range from very small scrapers to large irregular chunks used for cracking bones and shells. The technique employed was the simplest in stone working, that of battering one stone against another. As a result the size, shape and thickness of the flakes could not be controlled, and most specimens defy ready classification into distinctive types. Some attempts have been made to single out specimens which resemble Palaeolithic types in Europe and to apply European terminology to them; but unless it can be shown that such objects represent an industry, that is to say, come from a specific time horizon or from a limited area, their resemblances should be considered fortuitous and not evidence of a parallel evolutionary development. There seems to have been no notable change in Tasmanian specimens from the time the island was

first occupied until European settlers arrived in 1803, for those collected along old beach levels and in the extensive shell heaps along the eastern coast are indistinguishable from those in use in the nineteenth century. The Tasmanians were unacquainted with the principle of hafting and held all tools directly in the hand. The museum possesses a representative collection.

The question has been raised whether Tasmanian artefacts should be classified as Palaeolithic or Eolithic. This point is not important, and differences of opinion have been influenced by the comparison of these objects with those from the Lower Palaeolithic and Eolithic Ages of other parts of the world. Since there are both resemblances and differences, the question cannot be settled satisfactorily to all. But there seems to be no reason why specific similarities to either should be expected or required. The characteristics of the tools used by the ancestral Tasmanians before they left Indonesia, and their relationship to the earlier industries of that area, may indicate whether the Tasmanians simplified a Palaeolithic technique or retained an Eolithic tradition.

Several techniques of stone working are found in Australia. Australia, unlike Tasmania, has not been completely isolated, but has been influenced from time to time by the successive cultures of New Guinea. The stone flaking techniques include simple battering, the use of a striking platform and pressure flaking. The battering technique apparently was brought in by the Tasmanians and early Australians and is represented in the artefacts from all parts of the continent. The use of a striking platform, by which a large stone is broken to provide a surface to be struck with a hammer stone for the detachment of flakes, is of more limited appearance. Pressure flaking occupies the most restricted distribution and seems to be the most recent. These three flaking techniques are associated with Palaeolithic cultures in other parts of the world, but all have continued singly or as steps in procedure in the lithic industries of later times. Pressure flaking may have reached the continent several centuries ago from the Late Neolithic or Bronze Age cultures in Indonesia. The technique of stone grinding apparently was introduced in relatively recent times.

Little is known of the chronological relationships of the very simple types of artefacts, many of which have been collected as surface finds, but under conditions which suggest antiquity. Some have been found



only in local areas, but since most parts of the continent have not been investigated, the distributions indicated at the moment cannot be considered final. Most Australian objects can be readily classified into specific types.

Other types of flaked implements are in ethnological use and apparently have slight antiquity. These include quartzite spearheads manufactured by the striking platform method in North Australia, and pressure-flaked spearheads, made only in the adjacent Kimberley district of Western Australia. The latter type and its technique are spreading into the area of manufacture of the former and tending to cause them to become obsolete locally and thus archaeological rather than ethnological. The use of both types is still diffusing in other directions.

Stone mills are found almost everywhere in Australia. Their antiquity has not yet been indicated archaeologically, but presumably is not great. Since the operation of the stone mill unavoidably produces a smooth surface on both upper and nether stones, the mills should not be considered as examples of the stone grinding technique in the sense of the term usually understood. The purpose of the mill is to pulverize food and pigments, and the polishing of the implements is incidental to such use.

Stone grinding as a technique occupies a somewhat smaller distribution than the mills. Semi-polished axes, and, to a lesser extent, completely ground axes, are found in about two-thirds of the continent, and their use and technique of manufacture are still spreading into the western regions. A few ceremonial objects are produced by this technique in local areas.

The polished stone ax equipped with a handle has been derived from New Guinea and has replaced a variety of simple hand axes. The latter are still in use in the west.

### MELANESIA

From an archaeological point of view, Melanesia should be considered as two areas; Old Melanesia, which includes New Guinea, New Britain and New Ireland, and probably in late times the Solomon Islands; and New Melanesia which embraces all the islands east of the Pacific Moat to Fiji and New Caledonia. Old Melanesia provided the land bridge by which the Palaeolithic cultures were carried from Indonesia to Aus-

tralia, and from which subsequent influences spread to the continent. Nothing is known of the Palaeolithic Age in New Guinea, but the basic features in Australia should be present there. It also seems likely that early Neolithic influences from Indonesia reached the island prior to the coming of the Full Neolithic; hence transitional or Mesolithic cultures may be found. In New Melanesia, however, only Neolithic antiquity should be anticipated.

Virtually all the artefacts presently available from both Old and New Melanesia are typically Neolithic. The most widespread type is the polished stone ax or adze, the distinguishing feature of the so-called



Fig. 8. Canoe prow carved in the shape of a crocodile's head, Sepik River, New Guinea. (length 60")

"Round Ax Culture". We have noted its presence in the Mesolithic and Neolithic deposits in Indonesia and its diffusion from New Guinea to Australia. It is found throughout Melanesia and is present in Polynesia as far as the Society Islands, whence it was taken to New Zealand.

These axes arrived in western Indonesia during the Late Palaeolithic (Mesolithic) period, apparently sometime in the third millennium B.C., but we do not know how much time elapsed before they were diffused or carried by Negroid migrants through central and eastern Indonesia to New Guinea.

The Full Neolithic, as has been noted, may have reached western Indonesia between 2500 and 1500 B.C. Allowing time for its assimilation by Mesolithic Negroids in Indonesia and for their subsequent migration to and settlement of the long northern coast of New Guinea, it would seem that a minimum of many centuries would have passed before New Ireland was occupied. It is quite possible, therefore, that the Solomon Islands were not settled by these people until sometime in the first

millennium B.C., and that the Pacific Moat was not crossed from San Cristoval to Santa Cruz until near the beginning of the Christian Era. Some flaked tools have been found in the Solomons, but since most Neolithic cultures continue Palaeolithic traditions, their significance is uncertain. It should be kept in mind that the Melanesians to this day are not ocean explorers and navigators, but essentially coastwise sailors. Their migrations were probably made by small groups of people who would have found abundant land and opportunities for their simple sedentary activities in each new area. For a time there should have been no pressure of population to urge further migration. It has been only in recent centuries that these Melanesian speaking peoples rounded the eastern end of New Guinea and began to move westward toward the Fly River Delta.

The significance of pottery in the Neolithic Age of Melanesia is puzzling. As in Indonesia, its distribution is spotty. Archaeological appearances are found in districts where it is not made today, and its present manufacture occurs in localities where there seem to be no archaeological traces. Pottery is found in the two most distant outposts of Melanesia, Fiji and New Caledonia. In the latter area it has been reported in the oldest archaeological level. Pottery, with its great variety of forms, decorations and details of structure and composition, lends itself very nicely to comparative and chronological studies. But extensive excavations will be required before sufficient archaeological material is available for such purposes.

#### **POLYNESIA AND MICRONESIA**

Only the Neolithic cultures are represented in Polynesia and Micronesia. These regions, like New Melanesia, were out of reach until the perfection of ocean-going watercraft, at which time the Neolithic Age was well established in the East Indies. Since the details of the Neolithic deposits in Celebes and Halmahera have yet to be determined, we cannot list the likely possessions of the first migrants to the Pelew Islands and western Micronesia. The different natural resources in these areas undoubtedly limited certain traditional activities and caused the abandonment of some techniques. Stone is lacking in the coral islands, but *Tridacna* shell was substituted and adzes manufactured in the same shapes and by the same grinding technique used for stone in the volcanic islands. The basaltic stone available in the Marianas, Truk and

other volcanic islands did not permit the continuance of flaking industries dependent on flint and other kinds of brittle stone. Clay is lacking in some islands but not in others. Pottery is found archaeologically as well as ethnologically in western Micronesia, but its antiquity has not been determined. It is uncertain, therefore, whether it was a possession of the earliest migrants. It may be that pottery reached western Micronesia in later times. If so, it cannot be claimed that the ancestral Polynesians abandoned it as they moved eastward through the Caroline Islands. It is lacking throughout eastern Micronesia and Polynesia except Tonga, where it was introduced in recent times from Fiji.

The techniques and materials used in Micronesia set the pattern for Polynesia. The differences found in the artefacts of the two regions are minor in importance and probably the result of the greater elaboration permitted in the abundant volcanic islands in the latter area.

Adzes and nicely made food pounders are found in both areas, but stone pestles and chisels seem to occupy limited distributions in Polynesia. The presence of the Melanesian type ax in Central Polynesia and New Zealand has been mentioned.

A very significant stone artefact is the peculiar prepared sling-stone of biconical shape. Such objects are found in the Marianas and Carolines, in Hawaii and the Marquesas, and—strangely enough—in far off New Caledonia. This unusual distribution is puzzling, but it will be recalled that a prominent Polynesian strain is present in the New Caledonians.

Cut stone slabs or large rough stones are important in Polynesia for raised foundations for houses and for pavements around them, and for the construction of sacred temples, which usually consist of an open paved area surrounded by low stone walls. These structures are characterized by considerable variation in details, and the distributions of these traits provide valuable evidence for chronological studies. Stone pavements and foundations are also found in the volcanic islands of Micronesia. A few interesting stone structures are present in Kusaie and Ponape. On the island of Yap are the famous flat, circular stones used for money. The large ones, which resemble our perforated grindstones, may be twelve feet in diameter. These objects were made in the Pelew Islands and transported four hundred miles to Yap, the only place where they seem to have been used. The large specimens could not be em-

ployed as currency but were stuck upright in the yard and served as media for credit, as well as for backrests. Backrests of ordinary stone slabs are found elsewhere in western Micronesia.

Stone houses were constructed in Easter Island, where wood is scarce. It is also on this island that stone sculpturing reached its greatest and almost exclusive development. The huge Easter Island statues, with their stone hats, represent a most impressive attainment, even from the point of view of world comparisons. A few stone statuettes were made in the Marquesas, but usually wood was employed. Capped upright slabs are found in far away Micronesia.

Shells, ivory, whale teeth and turtle shell and, in New Zealand, jade, were utilized for a variety of implements and personal ornaments. These objects provide good archaeological evidence for studies in culture change and diffusion. Some rock carvings have been found in Polynesia.



*Fig. 9.* Stone money of Yap, Caroline Islands.  
(diameter  $19\frac{1}{2}$ " )