Polynesian Origins

Theories of migration from Asia or America obscure the probability that the culture had many sources.

Edwin N. Ferdon, Jr.

When the raft *Kon-Tiki* crunched down on the reef off Raroria atoll in 1946, the story made the front page. Later, the voyage was the subject of a best-selling book, and the moving picture of the expedition won an Oscar award. To the skipper of the raft, Thor Heyerdahl, these were fringe benefits, for the real goal had been to prove to a world of doubting and experiment-shy anthropologists that the prehistoric Peruvians, at least, had had seaworthy craft capable of taking them to Polynesian islands. The idea that American Indians might have reached, and even populated, some of the Polynesian islands was not new. However, the concept had been laid aside because it was believed, though not shown, that no adequate craft had existed in prehistoric America and that the American Indians lacked the necessary navigational skills.

If the joys of successful experimentation were pleasant, they were equally short, for with the publication of his theoretical book (*1*), the skipper of the *Kon-Tiki* opened a Pandora's box of conservative, tradition-bound anthropological argument.

The controversy that ensued over East versus West as *the* source of the people and culture of Polynesia has tended not only to obscure the complexity of the problem but to conceal the numerous other possibilities. Although this controversy has stimulated research on Polynesia, an unfortunate secondary effect threatens the eventual results of these new and vigorous efforts. Today there is a tendency to interpret new knowledge in terms of the old East-versus-West argument, as if the twain should never meet, and as if no other interpretations were possible. To continue within this rigid frame will mean losing the healthy effect of revitalization which the initial controversy precipitated.

The origin, or origins, of the people and culture of Polynesia has been the concern of seafarers, missionaries, and scientists since the days of Captain Cook. The range of theories is only slightly exceeded by the variety of evidence mustered to support particular concepts. Mainland Asia, Indonesia, Melanesia, Micronesia, the Philippines, and west-coast America have all been proposed as possible points of departure for one or more migration waves into this island world.

By the beginning of World War II, anthropological interest in Polynesia, especially as regards origins, had waned noticeably. Perhaps because the Bernice P. Bishop Museum in Honolulu dominated the field of Polynesian anthropology, the views of its director, Sir Peter H. Buck, were generally accepted as the best that could be arrived at from available data.

According to this widely accepted pre-*Kon-Tiki* concept, the Polynesians originally were a group of people of one composite race located somewhere in Indonesia (*2*, p. 26). They were thought to have broken away from their original homeland at some early date, and, with their then existing culture complex, to have migrated in one or more waves to their present island domain by way of Micronesia. According to other versions, they migrated along the north coast of New Guinea (*2*, p. 43). Except for minor Fijian influence in extreme western Polynesia and for certain food transmissions from Fiji (*2*, pp. 310, 316), these people were seen as having evolved biologically and culturally in isolation until their discovery by Europeans.

Although broad, ethnologically based culture areas had been established for Polynesia, their existence had been explained as in no way reflecting occasional and varied outside influences but rather as the result of splinter migrations which broke away from the original migratory band. As a starting point for their own isolated cultural evolution, it was thought, these splinter groups had taken with them the bulk of the cultural content of the original band, plus the various elements which had evolved locally up to the time of departure. Thus, the difference between one culture area and another was considered to reflect the period when each broke from the main (or an ancillary) migratory body, the cultural inventory at the time of the break, and the internal cultural evolution of each splinter group after its isolation on some other island or group of islands (*2*, p. 309). It was recognized that there was cultural exchange, other than of domesticated plants and animals, *within* Polynesia, but apparent parallels in traits beyond this insular area were regarded as the result of independent invention or of parallel development.

So firmly entrenched was the foregoing concept that the lack of supporting evidence in subsurface archeological excavations made before 1950 was brushed aside, with the simple statement that such deposits were too shallow and too recent to be of use. It was this archeologically unsupported concept of a single group origin from one location and of isolated, independent development that Heyerdahl consequently challenged, with his *Kon-Tiki* journey and his theory of an American Indian origin. This challenge, however, was a case of the pot calling the kettle black, for Heyerdahl, also without supporting archeological evidence, concluded that two specific areas on the continent of South America, Peru and the northwest coast, were dominant sources of Polynesian population and culture (*1*, pp. 705–707).

Although parts of Heyerdahl's book (*1*) suffer from his having been a novice in anthropology, his exhaustive coverage of the pertinent literature brought together a vast amount of widely dispersed information on the problem. Although some of his arguments could not be regarded as valid, others, if they did not wholly support his specific migration theory, certainly appeared to uphold a thesis that contact between prehistoric Polynesia and America had been made. Also, his trip aboard the raft had shown that the sailors and craft involved in such contacts were not necessarily Polynesian. If many of

The author is associate director of the Arizona State Museum, University of Arizona, Tucson.

his arguments were not fully acceptable to anthropologists, his discussions of the weaknesses of other theories were sound enough. These discussions cast a brilliant light on the inadequacy of the existing data to support the thesis that the Polynesians were, racially and culturally, a single homogenous group.

Of all the types of evidence yet brought to bear upon the question of human migration, probably the strongest has been linguistic evidence. The Polynesian language has been placed by linguists in the Malayo-Polynesian family. Peoples speaking these related tongues are spread in a near-continuous pattern from easternmost Polynesia westward through Melanesia (except for the interior of New Guinea) and Indonesia and across the Indian Ocean to Madagascar. Northward, related languages are spoken by certain peoples in Southeast Asia and the Philippines (*3*). Firm as this evidence would appear to be, reflecting, as it must, a strong influence throughout Polynesia of people speaking a common language related to languages spoken to the west, we know that language is culturally transmitted and that, therefore, one language may be supplanted by another in a variety of ways. Thus, although the linguistic proof of a connection to the west seems sound enough, it is not acceptable per se as proof that no other people existed and that no other languages were ever spoken on any or all of the islands of Polynesia.

The use of genetic information was another approach through which it was originally hoped the question of Polynesian origins would be resolved. With the increasing use of blood typing in genetic studies, it was felt that here, at last, was a biological approach which might more clearly indicate the probable source, or sources, of the Polynesian people. Contrary to the linguistic evidence, the results of a study of blood groups and gene frequencies of the Cook Islanders, made by Simmons, Graydon, Semple, and Fry, prompted these workers to state (*4*), "The blood groups and gene frequencies presented here for the Cook Islanders do not invalidate the conclusions reached, that there is a close blood genetic relationship between American Indians and Polynesians, and that no similar relationship is evident when Polynesians are compared with Melanesians, Micronesians, and Indonesians, except mainly in adjacent areas of direct contact." Later, after working with blood samples from eastern Polynesia collected by the Norwegian Archaeological Expedition to Easter Island and the East Pacific, Simmons and Graydon concluded (5), "The results obtained are comparable with those previously reported for Maoris of New Zealand and Cook Islanders, and in a number of characters are comparable with some South American Indian tribes. No such similarity is evident when comparisons are made with Melanesians, Micronesians and Indonesians."

The results of this latter study have been challenged on the grounds that the blood samples taken by the Norwegian expedition were not from "pure" Polynesians (*6*, p. 214), but such criticism is basically fatuous. In view of the 200 years of contact with foreign sailors and travelers and the sexual license common in Polynesia, who could honestly expect, let alone prove, purity for any Polynesian sample? Of far more significance, granted the impurity of the samples, is the question of why the results showed apparent affinity with the American Indians. Obviously, as Suggs (*6*, pp. 35, 216) and Goldschmidt (*7*), and more recently Simmons (*8*), have pointed out, it is not enough to determine the present blood groups and gene frequencies for Polynesians and for other, surrounding racial groups and from these comparative data draw conclusions about racial relationships. Processes of microevolution, such as genetic drift, mutation, and selection—especially those selective factors that have operated in historic times through the decimation of native populations by European diseases—must be determined and taken into account. Even if the difficulties originally encountered in determining blood types from prehistoric bone material should be resolved, the microevolutionary forces must be taken into account before much more can be said about the biological relationships of the Polynesian peoples.

While claims and counterclaims were being made, and the data were being said to support one theory or its opposite, one of the primary sources of basic evidence, subsurface archeology, had been virtually neglected. Prior to World War II, only two excavations, one on Tonga (*9*) and the other in New Zealand (*10*), had been made. This lack of professional interest stemmed in part from the difficulty of access to the numerous islands. To a larger extent, however, it stemmed from a misconception, current as late as 1953: "sites are shallow, refuse is sparse, and there seems to have been relatively little change in culture through time" (*11*). However, with the revitalization of research in the Pacific it was realized that, shallow or not, Polynesian archeological deposits must be excavated, and that, for purposes of comparison, such activity must be extended into neighboring areas.

In 1950, as part of a University of Hawaii course in archeological techniques, Emory and several of his students undertook the excavation of a series of shelters on Oahu (*12*). In 1953 Heyerdahl, with two archeologists, conducted a brief expedition to the Galapagos Islands, where, to the surprise of everyone, prehistoric Peruvian pottery was found (*13*). Two years later Heyerdahl moved his archeological activities directly into Polynesia by organizing and financing a major expedition to conduct excavations on Easter Island and several other islands of eastern Polynesia (*14*). No sooner had this expedition gotten under way than the American Museum of Natural History sent Suggs to the Marquesas (*15*); then, somewhat later, Roger Green undertook excavations in the Gambier Islands and the Society Islands. During this same period, New Zealanders became increasingly interested in what their country could reveal of Polynesian prehistory. They now are excavating on other Polynesian islands as well. Other excavation has been undertaken, by archeologists of various nationalities, in neighboring Melanesia and Micronesia. Today, more archeological expeditions than have ever before been concerned with Oceania are either in the planning stage or already in the field.

As of today, it would be foolhardy to attempt to summarize our knowledge of Polynesian prehistory on the basis of the excavated record. The record is excessively spotty, and the sites are separated by hundreds of miles of ocean; moreover, the results of numerous archeological excavations now being made are certain to alter the present view, which, at best, is a delicate and highly mobile frame of reference.

Thanks to dating by the radiocarbon technique, we now know that Polynesian prehistory goes back farther than had previously been estimated, and that it does evince change through time. A date of 122 B.C. has been established for human occupation in the Marquesas at the eastern edge of Polynesia, while a date of A.D. 9 has been obtained for Samoa, at the western extremity. An early date of occupation of 46 B.C. has been obtained for neighboring Fiji,

and it seems reasonable to expect at least temporally comparable evidence of human occupation on Samoa. Far to the north, in Hawaii, a possibly valid date of A.D. 124 may indicate that this outpost of Polynesia was settled at about the beginning of the Christian era. To the south, in New Zealand, where 38 radiocarbon samples have been obtained, the earliest date of occupation so far obtained is around A.D. 1000 (*16*).

Because much of Polynesian material culture was of a perishable nature, the number of artifacts that have remained in the soil is quite limited. Pottery, which readily lends itself to change in form and decoration and is, therefore, especially useful in the finer cross-dating of one archeological deposit with another, so far appears to be largely restricted to western Polynesia. However, the pioneering efforts of Duff of New Zealand (*17*) in classifying the numerous stone adzes of Polynesia will, as their stratigraphic relationship is gradually determined through excavation, aid in determining cultural relationships. Careful study of the stratigraphic sequence of fishhooks from excavations in Hawaii (*18*) has already shown that the fishhook is another artifact whose change through time may aid in determining island relationships at different periods. No doubt the stone *poi* pounders of central and marginal Polynesia will eventually prove of equal value. On Easter Island, where no deep culture-bearing deposits were found, archeologists turned to excavation of the great ceremonial platforms called *ahu*. Here they found that, as with Mesoamerican ceremonial structures, various platforms had been covered or modified through time so that the shape and variety of the architectural features provided a means of interpreting changing religious functions and of estimating relative dates (*19*). Thus, although the available archeological record is not as rich in Polynesia as in other parts of the world, nevertheless, the record in the islands can provide ample evidence on which to reconstruct the culture of Oceania.

Problems of Interpretation

Undoubtedly a mass of archeological information will be revealed in the next several years, and thus the greatest problem facing the culture historian is proper interpretation of the data.

Anthropologists, being essentially landlubbers, have long interpreted the concept that an ocean is a formidable barrier to mean that it is an absolute barrier to all but a highly specialized few. Over the years this restricted interpretation has limited the search for potential sources of cultural inspiration for any given primitive group to other societies on connected, or immediately accessible, land masses. Thus, the anthropological search for possible prehistoric contacts between the Old World and the New, for prehistoric American-Polynesian contacts, and for prehistoric Asiatic-American over-water contacts has been restricted by insistence on the kind of proof that could be found only where a more or less continuous contact, or a series of chain-linked contacts, had occurred between two cultures over an extended period. I do not question the general validity of a requirement for proof of long-continued contact, but the requirement is unrealistic where the route of dispersal involves the crossing of great oceans, especially where one-way voyages may have occurred.

That one-way accidental voyages did occur within Polynesia has been amply documented by Sharp and Dening (*20*, pp. 57–78; *21*). Also, historic records of derelict junks encountered in the north Pacific as far east as Mexico, many of which carried survivors after months of drifting (*22*), testify to the fact that accidental dispersal of mankind in the Pacific has occurred. This is not to say that there were no planned voyages into, and within, Polynesia, but, as Sharp has demonstrated from historic documentation, the Polynesians were largely limited, geographically, to island groups that they had the navigational ability to reach. Once the Polynesian mariner had passed these limits, as a result of storms, wind shifts, or other natural hazards, he was essentially lost, and his final destination was a matter of happenstance.

In addition to unplanned voyages into distant seas, there were probably planned voyages into the unknown, made for a variety of reasons, including the basic one of overpopulation. Unless there was cultural control of population, overpopulation could have become a cyclic phenomenon in this island world and thus have induced a series of migratory resettlements. That the Polynesians did make such planned voyages into the unknown, with the full knowledge that they did not have the navigational skill to return, and that only by chance could they do so, is indicated by the inventory of human and cultural cargo they carried on some of their voyages. This inventory appears to have included as much of the homeland cultural complex as possible, so that a new settlement could be made with the fewest possible adjustments (*2*, pp. 39–41, 68–69, 99–100).

In terms of cultural diffusion into, and throughout, Polynesia, the two types of voyagers—those who migrated intentionally and those who migrated unintentionally—are distinguished by the fact that the former carried with them as much of their human and cultural heritage as they could, whereas the latter brought to an island refuge only their personal knowledge and concepts of their original cultural worlds and any objects which happened to be aboard the vessel when it was carried into unknown seas. Thus, the intentional landing of a group of immigrants on an uninhabited island assured the transplanting of a fairly complete cultural inventory of the parent complex. If the island were already settled, such a landing offered a choice of culture traits. This was a far greater cultural contribution than could be made by a solitary voyager who made an unplanned landing.

It appears likely that at least one population group which entered Polynesia and spoke a Malayo-Polynesian language developed, or maintained, a cultural tradition of intentional migratory voyaging. Because this tradition was probably maintained over several centuries, a basic language and culture were successfully implanted throughout the Polynesian islands. However, as new cultural information is revealed through excavation, it must be kept in mind that other population groups may have been equally successful at an earlier date and may later have been wiped out, subjugated, or amalgamated.

Because intentional migrants would tend to transplant a variety of trait complexes, the similarity of complexes between distant Polynesian islands has been accepted as proof of prehistoric contact and attendant diffusion. Where a variety of specialized developments on various islands do not fit into the total assemblage of interfunctioning traits, they have too often been interpreted as the result of independent invention. However, it is precisely this type of specialized characteristic, which seemingly does not fit into basic Polynesian culture, that could reflect the influence of single voyagers who made unplanned landings.

Although it is seldom realized, there

is a parallel between the chance dispersal of animals and the chance dispersal of man onto Pacific islands. Just as faunal associations that spread to an island by the accidental transferral of occasional individuals exhibit an imbalance, so cultural influences that spread in a similar manner can result in the incorporation of one or more culture traits into an already existing, but wholly different, functional complex. Thus, individual components of such a complex may resemble components of a complex in another area of the Pacific and indicate contact and diffusion, even though the complexes are quite different. With cultural as with faunal dispersals of this accidental type, there is no reason to believe that such trait diffusion is not "relatively random or indeterminate." With man as with faunal associations, "groups that might cross do not necessarily do so; crossings may be long delayed and are scattered through time; and the sequence seems to depend in part on chance" (*23*).

Of course, the insular dispersal of prehistoric man does not wholly fit the pattern of faunal accidental dispersal. Unlike other animals, man has the power to set out intentionally upon the sea, to extend his period of survival by living off the sea, and, weather and currents permitting, to direct his course to the extent of his navigational ability. Because of these factors, the chances of man's reaching and occupying island after island, even in the vast Pacific, is considerably greater than the chances of faunal dispersal from island to island by natural means, and the time required would of course have been very much less.

Environment and Human Dispersals

The essential environmental requirement for the inception of either a migratory or an accidental voyage is a littoral where a maritime culture can arise. However, the factors that precipitate the two kinds of voyages are quite different. The planned voyage presupposes navigational knowledge, equipment for sailing on deep waters, and an urge to seek new lands. Ascertaining the possible points of origin of such planned voyages in the Pacific is basically a problem of determining the locations of prehistoric advanced maritime cultures bordering on the Pacific. In this respect the problem is one of anthropological interpretation and appraisal of circum-Pacific cultures. Such an appraisal has hardly been begun.

As for accidental voyages, these could originate within any maritime culture where there was any kind of seagoing craft. Thus, the possible points of origin of accidental voyages into Polynesia are much more numerous and cover a much greater geographic area than the possible points of origin of intentional voyages. The craft of many primitive maritime societies were suitable only for inshore cruising, but the fact remains that such craft could have been blown into open seas. Although the mortality rate would have

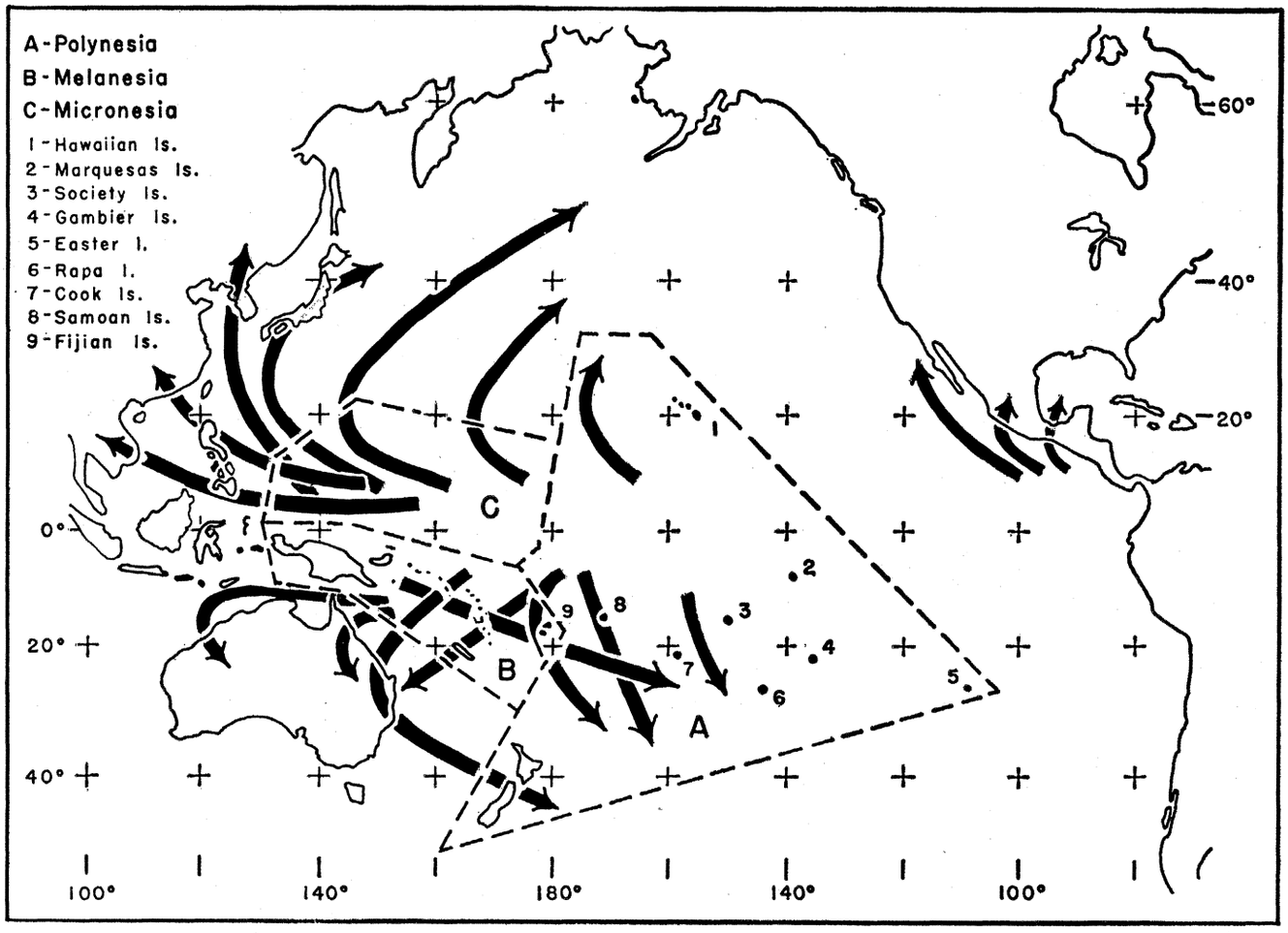

Fig. 1. A greatly simplified representation of paths of hurricanes in the Pacific. [The generalized routes of the hurricanes were plotted from information in S. S. Visher, *Bernice P. Bishop Museum Bull. No. 20* (1924), and O. W. Freeman, in *Geography of the Pacific* (Wiley, New York, 1951)]

been high, there would always have been a chance of survival. Animals have been able to survive on floating trees and other objects (*24*), and certainly primitive fishermen, with their knowledge of the sea and their ability to live off it, would stand a considerably greater chance of survival.

Although maritime cultures have developed around the greater part of the perimeter of the Pacific, not all of these culture areas are equally likely points of origin of accidental voyages, because winds of the strength to blow a vessel into unknown seas occur less frequently in some of these areas than in others. Principal among such winds are hurricanes, or typhoons, and gales.

The dominant area of hurricane occurrence in the Pacific is in the western part, immediately to the north and to the south of the equator (Fig. 1). Most of the hurricanes that occur to the north of the equator develop over an area between 120 and 160 degrees west longitude. Passing to the north of New Guinea, the Celebes, and Borneo, some of the hurricanes move west and north, striking the mainland of Southeast Asia. Others move first to the west and then veer north and northeast, striking the coast of China, the Philippines, and Japan before advancing into the north Pacific.

To the south of the equator, hurricanes develop over an area from 160 degrees west longitude to 160 degrees east longitude. These pass over the southern islands of Melanesia, east of New Guinea; over the southwestern area of Polynesia; and, to the west, over Australia. Far less frequent but of equal importance are the hurricanes that occur off the Pacific coast of Guatemala and Mexico, as well as those that occur occasionally well off the coast of South America (*25*).

Less violent than hurricanes, but capable of driving a ship into unknown seas, are gales with winds of 43½ kilometers (27 miles) per hour or more. Figure 2 shows the extreme equatorward distribution of those areas of the Pacific in which winds of this force, or greater, have made up 5 percent or more of the wind observations (at 12 noon, Universal Time) for any single month of the year.

The area from New Guinea to Borneo is largely free of such winds, as it is of hurricanes. However, the Asiatic mainland from Southeast Asia northward, as well as the islands of Micronesia and the northern Philippines to Japan and northward, are subject to such winds during at least 1 month of the year. To the south, the equatorward limits of winds of fresh-gale strength extend from, roughly, Cape Flattery, Australia, northeastward around New Guinea to the Solomon Islands, and eastward in a sinuous line to include most of the southern Polynesian islands south of 12 degrees south latitude. Along the coast of South America, the equatorward limit of such winds in the Southern Hemisphere is in the approximate latitude of Santiago, Chile. In the Northern Hemisphere the winds have a continuous distribution along the coast from Alaska down to the vicinity of

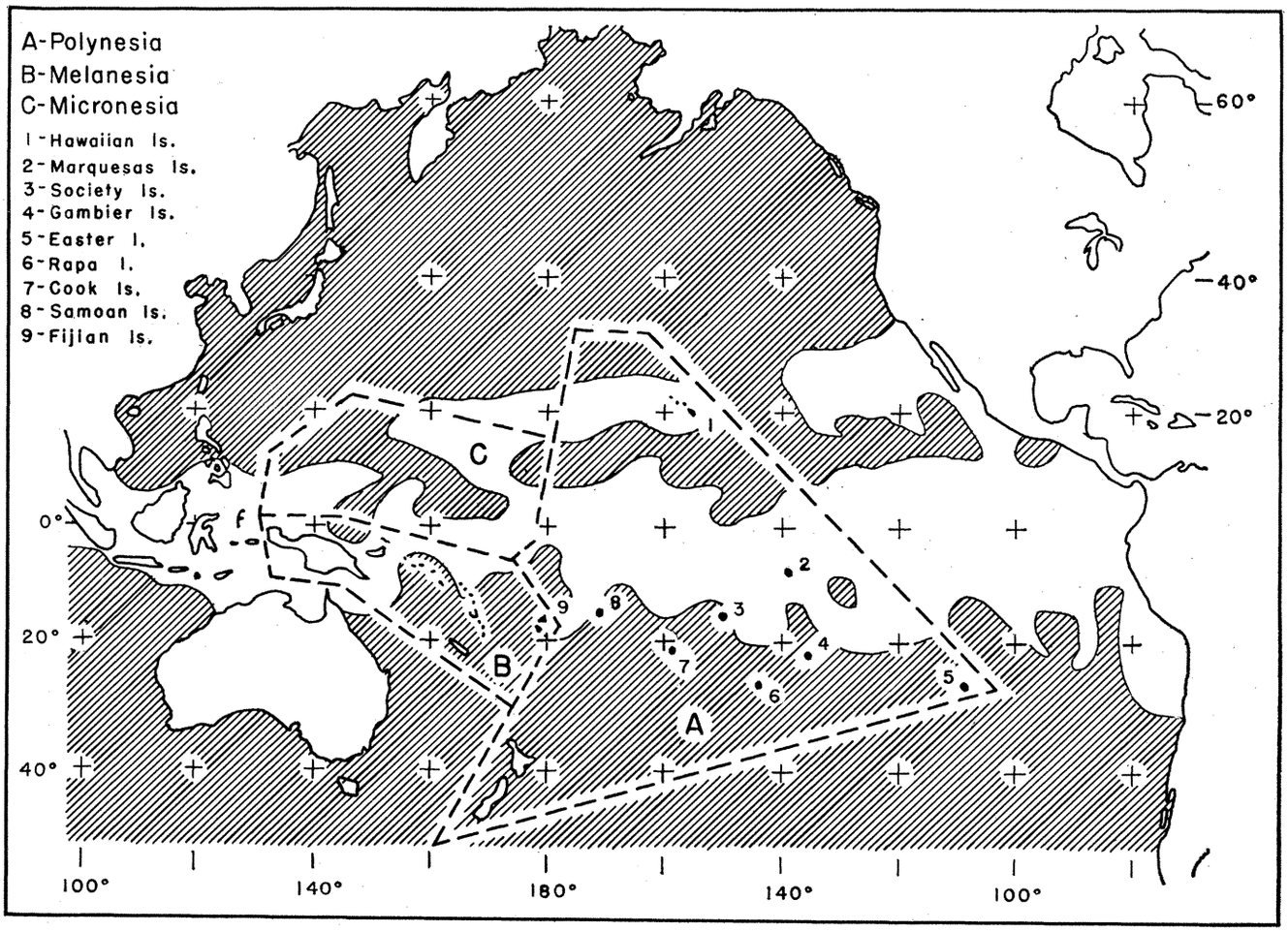

Fig. 2. Average maximum equatorward distribution of gales of 43½ kilometers (27 miles) per hour, or more, in the Pacific. [The data were obtained from W. F. McDonald, *Atlas of Climatic Charts of the Oceans* (U.S. Weather Bureau, Washington, D.C., 1938)]

Santa Barbara, California, and there is an isolated area of occurrence at, and to both sides of, the Isthmus of Tehuantepec.

From the premise that weather phenomena of this type are the principal cause of accidental voyages, we may logically reason that the likelihood of occurrence of such voyages is greatest in those areas of the Pacific where both hurricanes and gales occur. Thus we conclude that Southeast Asia, the Philippines, the lands washed by the East China Sea between Formosa and Japan, the lands touched by the Sea of Japan, the east coast of Australia, and Melanesia south and east of the Solomons are the most likely areas of origin of accidental voyages, as both typhoons and gales occur frequently in these regions. Almost as likely an area of origin, in the east Pacific, is the south coast of Oaxaca and Chiapas, Mexico. Hurricanes occasionally occur north of this region to Baja California, and gales occur along the west coast of the United States and Canada, roughly from Santa Barbara northward, and along the south-central coast of Chile from Santiago to the Chonos Archipelago. Thus, these coasts might have been areas of origin of accidental voyages.

At this point one is tempted to postulate that the Asiatic areas where hurricanes and gales are most frequent are *the* sources of the people and culture of Polynesia. They may indeed be the dominant sources. However, the eastern coast of the Pacific has its area of storms, and since it is accidental dispersal that we are considering, these areas also must be considered.

Disregarding planned voyages, we can see that any Pacific-coast area where hurricanes or gales are frequent and where man has had a maritime orientation might have been a source of Polynesian culture. Whether or not it was, when (if at all) its influence was felt, and where the island that received this influence was located are matters that can be determined only through comparison of the culture history and cultural remains of these many coastal and island localities, and through study of the ocean currents and winds between these coasts and islands.

The course of a vessel on a planned voyage, as well as that of one accidentally sailing unknown seas, would have been largely dependent upon the natural elements. Ocean currents and major wind systems probably would have governed the course of the vessel that was lost or would have influenced the choice of direction in the case of a fully operational primitive craft. Heyerdahl has justifiably laid great stress on the effects of these systems in determining the principal over-water routes of prehistoric migrants (*26*). However, remarkably little attention has been paid to the opportunities presented by the monsoonal wind-shifts of the western Pacific and the spiraling winds that

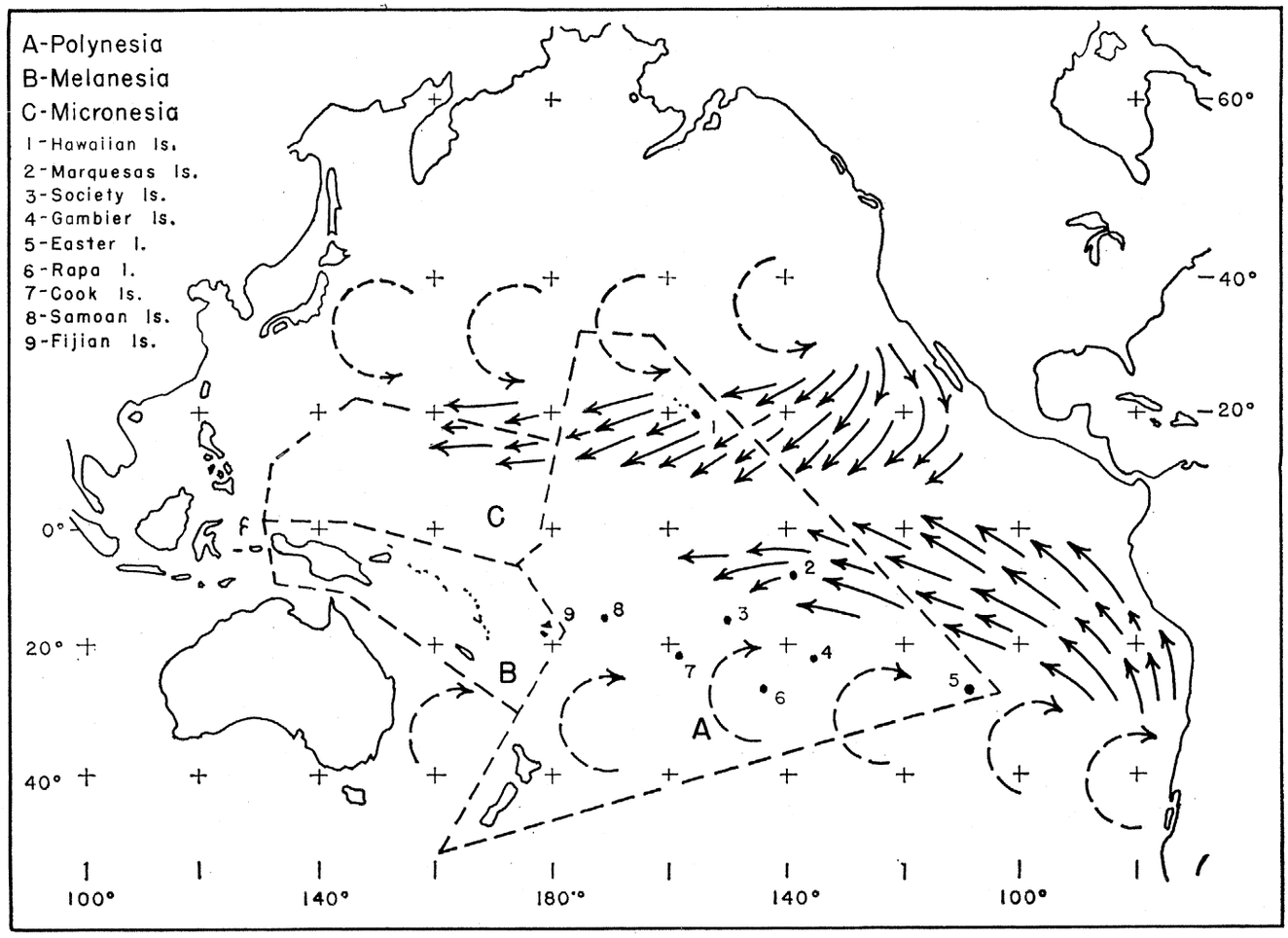

Fig. 3. Map showing the approximate equatorward limits (curved, dashed arrows) of the westerly-wind effect from cyclonic storms in the Pacific during the period of low sun in each hemisphere. The solid arrows indicate the extent and the average direction of the easterlies during at least 60 percent of every month of the year. [Data for the compilation of dominant easterly winds were obtained from W. F. McDonald, *Atlas of Climatic Charts of the Oceans* (U.S. Weather Bureau, Washington, D.C., 1938)]

accompany the eastward passage of cyclonic storms in both hemispheres. In the Northern Hemisphere these winds blow in a counterclockwise path around the center of a low-pressure storm, so that winds on the equatorial quarter of a cylonic disturbance tend to blow from the west or northwest—that is, in a direction opposite to that of the easterlies, which they frequently displace in the subtropics and higher latitudes of the tropics. In the Southern Hemisphere the circular path of cyclonic winds is clockwise, resulting in a similar displacement of marginal easterlies by westerly winds. Thus, in the subtropics of both hemispheres, in spite of opposing ocean currents and the normally dominant easterlies, a craft could be borne to the east by a cyclonic disturbance (*20*, p. 88; *24*). Thus, the assumption that simple craft could have made a west-to-east crossing only in the cold, higher latitudes of westerly winds and currents is not valid. Because the dominance of the easterlies in the higher tropical latitudes is a seasonal matter, I have indicated in Fig. 3, by directional arrows, those regions where easterly winds account for 60 percent or more of the observations for every month of the year. These areas, then, may be said to be virtually dominated by the easterlies the year round; undirected craft entering these regions would normally follow the path of the arrows, while craft under sail could also move easily to the north or south. However, on the poleward edges of these easterlies, movement to either the east or the west would have been possible, depending upon the season. That primitive sailing craft could have made headway against the easterlies is not denied, but to do so would have been time-consuming, and it is obvious that, in sailing an unknown sea, the more ocean the vessel covers each day, the greater is the chance of discovering land and, therefore, the greater is the chance of survival.

Although one might reasonably expect those Polynesian islands that are closest (geographically, and from the standpoint of wind and current) to a continental mass to exhibit the greatest number of cultural parallels, islands are, of course, but dots in the Pacific, and migrants as well as involuntary voyagers might unknowingly pass them by and transplant themselves a thousand miles deeper into the Pacific. In this respect Polynesia differs from most other culture areas of the world, for the possible sources of human cultural influences, on any Polynesian island, are not necessarily influences from adjacent areas. For this reason culture traits or complexes may not exhibit a continuous island-to-island distribution from their point of origin.

Because there are many possible sources of Polynesian origins and many possible routes of travel, we can never expect to gain a complete picture of this maritime activity. We can learn a good deal, however, through greater understanding of the nature of such voyages and through appreciation of the fact that cultural changes attributable to an unplanned voyage were matters of chance and that numerous, sometimes evanescent, factors governed the acceptance or rejection of ideas and objects transported in this manner.

Since voyagers, especially involuntary voyagers, may have implanted only fragments of their culture in Polynesia, the picture is a mosaic, and it will indeed be difficult for the culture historian to determine the sources of the pieces. Incorporation of a cultural component into a particular island culture would have resulted in new uses; the component would seem aberrant in its new association, and the culture historian would be likely to overlook it as evidence of cultural diffusion.

The problem of Polynesian origins and cultural diffusions is far too complex to be solved from immediately available evidence. The variety of possible sources and of possible routes is infinite. What routes were chosen, and what routes were forced upon what number of undirected vessels, can never be completely known. Only through a broad view and an awareness of these facts can we eventually arrive at a better interpretation of the meaning of the data derived from archeological evidence, ethnographic collections, and historic and ethnological observations.

Although the results of many of the more recent excavations are still being compiled, a few have been published. Happily, many of these reflect the authors' understanding of the complex and nascent nature of Polynesian archeology. Conclusions are limited to the problem at hand, and comparisons, if any, are made only to point up the need for excavations in other, possibly related, areas. Although the field still suffers slightly from pronunciamentos concerning Polynesian origins, the more thoughtful Pacific archeologists are awaiting the day when enough excavated objects have been accumulated to provide a sound basis for the reconstruction of Polynesian prehistory (see *27*).

References and Notes

1. T. Heyerdahl, *American Indians in the Pacific* (Allen and Unwin, London, 1952).
2. P. H. Buck, *Vikings of the Pacific* (Univ. of Chicago Press, Chicago, 1960).
3. A. L. Kroeber, *Anthropology* (Harcourt, Brace, New York, 1948), pp. 215–216.
4. R. T. Simmons, J. J. Graydon, N. M. Semple, E. I. Fry, *Am. J. Phys. Anthropol.* **13**, 687 (1955).
5. R. T. Simmons and J. J. Graydon, *ibid.* **15**, 365 (1957).
6. R. C. Suggs, *The Island Civilization of Polynesia* (Mentor, New York, 1960).
7. E. Goldschmidt, in *Abstracts of Symposium Papers, 10th Pacific Science Congress* (Honolulu, 1961), p. 99.
8. R. T. Simmons, *Oceania* **32**, 209 (1962).
9. W. C. McKern, *Bernice P. Bishop Museum Bull. No. 60* (1929).
10. R. Duff, *Canterbury Museum Bull. No. 1* (1950).
11. I. Rouse, in *Anthropology Today* (Univ. of Chicago Press, Chicago, 1953), p. 58.
12. K. P. Emory and Y. H. Sinoto, *Bernice P. Bishop Museum Spec. Publ. No. 49* (1961).
13. T. Heyerdahl and A. Skjölsvold, *Soc. Am. Archaeol. Mem.* **12**, No. 2 (1956).
14. T. Heyerdahl, in "Archaeology of Easter Island," T. Heyerdahl and E. N. Ferdon, Jr., Eds., *Monographs of the School of American Research and Museum of New Mexico, No. 24, part 1* (1961), pp. 15–19.
15. R. C. Suggs, *Anthropol. Papers, Am. Museum Nat. Hist.* **49**, 1 (1961).
16. R. Shutler, *Asian Perspectives* **5**, 193 (1961).
17. R. Duff, in *Anthropology in the South Seas*, J. D. Freeman and W. R. Geddes, Eds. (New Zealand, 1959), pp. 121–147.
18. K. P. Emory, W. J. Bonk, Y. H. Sinoto, *Bernice P. Bishop Museum Spec. Publ. No. 47* (1959).
19. R. Mulloy, in "Archaeology of Easter Island," T. Heyerdahl and E. N. Ferdon, Jr., Eds., *Monographs of the School of American Research and Museum of New Mexico, No. 24, part 1* (1961), pp. 93–180; C. S. Smith, *ibid.*, pp. 181–219; E. N. Ferdon, Jr., *ibid.*, pp. 223–229.
20. A. Sharp, *Ancient Voyagers in the Pacific* (Penguin, Harmondsworth, England, 1957).
21. G. M. Dening, *J. Polynesian Soc.* **71**, suppl. 137 (1962).
22. J. F. G. Stokes, *Proc. Pacific Sci. Congr. Pacific Sci. Assoc., 5th* (1934), vol. 4, pp. 2791–2803.
23. G. G. Simpson, *Evolution and Geography* (Univ. of Oregon, Eugene, 1962), p. 24.
24. E. C. Zimmmerman, *Insects of Hawaii* (Univ. of Hawaii Press, Honolulu, 1948), vol. 1, p. 57.
25. S. S. Visher, *Bernice P. Bishop Museum Bull. No. 20* (1925), pp. 56–60.
26. T. Heyerdahl, *Am. Antiquity* **28**, 482 (1963).

27. I thank Drs. Emil W. Haury and Raymond H. Thompson of the department of anthropology, University of Arizona, for their critical reading of the manuscript.