P. de Josselin de Jong

The Kon-Tiki theory of Pacific migrations (met platen)

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THE "KON-TIKI" THEORY OF PACIFIC MIGRATIONS

The adventurous hundred-days' voyage of Thor Heyerdahl and his companions by balsa raft from Peru to the Tuamotus for once drew worldwide attention to a feat of great courage and endurance which was not carried out to break or set up some record, but for a worth-while purpose: to substantiate a scientific theory. In his recent book "American Indians in the Pacific" (George Allen and Unwin, London 1952) Heyerdahl briefly tells of the events which led to that exploit: field research in the Marquesas in 1937—38 led Heyerdahl to the conclusion that "America rather than Asia had contributed to the direct settling of Polynesia, and that the original island discoverers had come by rafts drifting directly.... from Peru".

In 1939, and again in 1946, he failed to find a publisher for a monograph in defence of this view, except for a much abridged version: "Did Polynesian culture originate in America?" (Heyerdahl, (1)). In discussions with Americanists it appeared that a serious objection to any theory of raft voyages across the Pacific lay in the alleged fact that a balsa raft soon became waterlogged, and would therefore be incapable of carrying out a voyage of any great length. The only way to examine the sea-going capacities of such a raft being an actual voyage with one, Heyerdahl and five companions set out from Callao, Peru, on board the raft Kon-Tiki in April 1947, and in August managed to land safely on an atoll in the Tuamotus, although the raft suffered heavy damage when at last it landed on the reef. The successful outcome of the venture demonstrated i.e. that "Polynesia was well within the range of coastal craft in aboriginal Peru".

In 1948 Heyerdahl published an account of the voyage, and part of its theoretical background, in "The voyage of the raft Kon-Tiki", in the periodical *Natural History*, Vol. LVII, and later, more fully, in his much-translated book "The Kon-Tiki Expedition". In 1950 his article "The voyage of the raft Kon-Tiki. An argument for American and Polynesian diffusion" appeared in the *Geographical*

Journal, Vol. CXV, and drew forth a rejoinder from Professor Heine-Geldern in Vol. CXVI of the same Journal: "Heyerdahl's hypothesis of Polynesian origins: a criticism". Thus commenced a lively controversy, with Heyerdahl and Heine-Geldern as chief antagonists, which is still unresolved. Heyerdahl replied to "A criticism" in: "Voyaging distance and voyaging time in Pacific migration" (Geogr. Journal Vol. CXVII). In "Kultur und Sprache" (Vol. IX of the Wiener Beiträge zur Kulturgeschichte und Linguistik) Heine-Geldern launched a new attack: "Some problems of migration in the Pacific", rather briefly answered by Heyerdahl in a supplement to Vol. VI/VII of the Archiv für Völkerkunde, entitled "Some problems of aboriginal migration in the Pacific". Meanwhile Heyerdahl's full exposé of his scientific theory had appeared, the book "American Indians in the Pacific" already referred to — and here, for the moment, the matter rests. In view of the size (some 760 pages) and substance of this latest contribution, it is understandable that no thorough-going criticism has yet been attempted; the only reviews of the book I know of so far have appeared in non-scientific journals, e.g. a review in the Manchester Guardian Weekly of September 18, 1952, by G. H. S. Bushnell (who was not convinced), and one in the Illustrated London News of August 16, 1952, by Sir John Squire (who was).

The present essay also does not have the pretention of being an exhaustive or detailed criticism of Heyerdahl's latest work. It will first summarize the theory, and the critical survey that follows will mostly confine itself to matters of principle, discussing details solely in order to elucidate the main argument; in addition it purports to bring to the fore particularly such aspects of the theory as directly concern those who are interested in Indonesian studies. The significance of the Kon-Tiki theory, as it may be called, for Indonesia is obvious, as the settling of Polynesia is generally seen in connection with the other migratory movements of peoples from South-East Asia into the Indonesian Archipelago and beyond. Several scholars, who agreed with this established point of view, have been struck by apparent resemblances between cultural elements in Oceania and in America, and have explained them as being imported into America from Oceania: Nordenskiöld, Rivet, Gräbner, W. Schmidt and Imbelloni for instance. Heyerdahl, on the other hand, considers them to be importations into Polynesia from America, and even to be proofs that the Polynesian islands were populated by migrants from North and South America, an explanation which has not been ventured since the days of Zúñiga and

Ellis, in the beginning of the 19th century. In brief, he believes the settling of Polynesia to be due to two groups of immigrants, the first coming from pre-Inca Peru ca. 500 A.D., the second from North-Western North America (the Kwakiutl and Haida area) ca. 1200 A.D.

In the work we are discussing he begins by giving his objections to the generally accepted view that the Polynesians reached their present habitat from the west. In the first place, the Polynesians differ somewhat from the inhabitants of the islands further west: they make a more "Caucasian" impression than the Indonesians, frequently having a fairer skin, narrower nose and wavy hair, which is not black, but "has a suggestion of brown", while sporadically even reddish or auburn hair occurs. A more precisely determined difference lies in the blood-groups: the human blood-groups are classified as O, A, B, and AB. Of these, A is frequent in western Europe, but decreases steadily the further east one goes, while B shows an ever-increasing frequency in these areas, reaching its maximum in India; B is still very frequent in Indonesia and Melanesia, but almost absent in eastern Polynesia (and in America).

Turning to prehistory Heyerdahl comes across a fact which also seems incompatible with a Polynesian migration from the west, i.e.: The Polynesians are at present generally held to have arrived in their present dwelling ca. 500 A.D. Up to the advent of the Europeans, they had a neolithic culture, lacking any knowledge of metal-working. Use of metal spread to the Philippines in the second century B.C. or thereabouts, and to areas in western Indonesia about the beginning of the Christian era. As, up to the advent of the Europeans, the Polynesians had a neolithic culture, lacking any knowledge of metal-working, they must have left Indonesia before the spread of metal-culture there. That leaves a considerable chronological gap between the time of their departure from South East Asia, say several centuries B.C., and their arrival in Polynesia, about 500 A.D. Where were they all this time? They cannot have been in Melanesia, or they would show greater physical and cultural similarity to the Melanesians. They can hardly have been in Micronesia, mainly because it is unthinkable that "neolithic man" could, on a voyage from the west, even discover these tiny atolls hidden in the vast ocean. Finally, and of very great importance: a west to east voyage to Polynesia is almost inconceivable, as it would imply travelling east against the prevailing easterly trade winds and against the predominating east to west Humboldt current. The author's own raft voyage,

on the other hand, proved that a craft could drift from Peru to Polynesia, carried along by wind and current. In view of these and other facts, Heyerdahl abandons the idea of an eastward migration into Polynesia, and instead assumes a first wave of migrants to have come from the pre-Inca culture-centre of Tiahuanaco, ca. 500 A.D.

This helps to solve some of the puzzles of the physical anthropology of Polynesia: in pre-Inca graves strands of hair have been found (shown on three pages of coloured plates) of a definitely reddish and even fair tint, thus corresponding to the reddish or auburn hair observed in Polynesia. Chimu pottery sometimes depicts human faces with a beard, these beards being so realistically rendered that the Chimu potters must have actually observed members of a "bearded-race", and beards do occur in Polynesia. Furthermore, myths and legends of Inca times speak of white men with beards who built the now ruined edifices of Tiahuanaco; of the white followers of the culture-bringer Viracocha, who brought light to a land that was in darkness; of bearded white men, some of whom were killed on the island in Lake Titicaca, and who finally walk away into the Pacific. These legends, according to Heyerdahl, are founded on historical fact, and must refer to a people of "Caucasian" appearance who passed through the Americas, and on to Polynesia. Whether these peoples were of the "Yellow-brown race", or actually immigrants of European origin, is at first left as a moot problem (p. 304), but afterwards (p. 345) the author hazards a guess, to which we shall refer again later.

Once an American provenance of the Polynesians has been accepted, it is worth while to examine how they arrived in their island home. Heyerdahl does so at great length in a chapter on the Peruvian raft, showing that balsas were observed quite far out to sea by Spanish and other European navigators, and discussing the craft's sea-going capacities. This chapter on "aboriginal Peruvian navigation in the East Pacific" is a valuable monograph in itself. One point that emerges from this study is that the idea that balsa logs become waterlogged too soon to allow them to be used on a long voyage only holds good for old, dry logs. If a raft is formed of young trees, with the sap still in them, this sap prevents the absorption of sea-water and keeps the raft buoyant.

Next, the author surveys a number of analogies in the cultures of Polynesia and ancient South America, many of which had already been listed as "Oceanic" traits in America by previous writers. Among these analogies are: stone statues and cyclopean walls; several cultivated plants, among them of course the *kumara* or sweet potato; the *quipu* or knotted

string record, the fermented drink *kawa*, the "venesection" bow, a number of musical instruments, feather headdresses, etcetera. We shall return to several of these points of similarity shortly. But Peru was not the only area from which the discoverers of Polynesia set out: a second wave of immigrants, according to H., sailed from the North-West American coast to Hawaii, settling central Polynesia ca. 1000 and New Zealand ca. 1350 A.D. Although the N.W. American Indians also have some of the physical traits of the Polynesians (fairish skin, occurrence of aquiline noses and wavy hair, etc.), this is not attributed to a "Caucasian-type" race, as were the same features in Peru; in this case the author keeps closer to the conventional view, and holds that the Haida and Kwakiutl, like "all the American Indians" originally came from the Asiatic continent (probably moving up the north-east Asiatic coast, across the Behring Straits, and down into America). But, in his opinion, after a prolonged stay in the area of Vancouver Island, a number of them then penetrated into Polynesia in the beginning of the second millennium of our era. Here again several analogies in the material and non-material culture of the two areas in question seem to indicate a direct connection. Heyerdahl discusses, among others: certain myths; the custom of landing canoes stern first; the resemblance between fish-hooks of Polynesia and North-West America; petroglyphs among the Bella Coola Indians and in the Marquesas; houses and ceremonial clubs of the North-West American Indians and the Maori, etcetera. Thus the picture of the Polynesian migrations is completed. The crux of Heyerdahl's theory therefore is that such resemblances as may be observed between features of Polynesian and of American culture are not due merely to diffusion of these features themselves, but are proofs of the wholesale settling of Polynesia by inhabitants of pre-Columbian North and South America. We think the above is a fair, if necessarily greatly curtailed, summary of the theory set forth in "American Indians in the Pacific".

We should remark straight away that, after reading this work, we felt that Heyerdahl was convincing only on a limited number of points; and the closer the facts and data were examined, the fewer these points tended to become. For one thing, Heine-Geldern's criticism does seem to carry weight in several important particulars. For example, he shows that although trade winds undoubtedly do predominate in Oceania, they do not render a west-to-east sailing virtually impossible, as Heyerdahl would suggest. Westerly monsoons penetrate far into the Micronesian

area; even in Polynesia there are spells of westerly winds, the yearly average of such winds being about 22 %, the average for February even 48 %. Several cases are cited of recent and well-attested eastward voyages, even involuntary voyages, in native craft. Heine-Geldern (Heine-Geldern (1), 185—187) and A. Riesenfeld also point out that archeological evidence does not square with a westward migration into Polynesia. The neolithic quadrangular adzes occurring in Polynesia are widely distributed in China, Indo-China, the Malay Peninsula and Indonesia; the equally neolithic shouldered (or stepped) adzes occur not only in Polynesia, but also in South China, Japan, Formosa, the Philippines and Celebes. Both types are rare in the Americas, but extremely frequent in South-East Asia. As the quadrangular adzes found in China have been dated at approximately 2000 B.C., and the shouldered adzes in the Philippines at 1250—200 B.C., they cannot possibly all have spread from America, nor can their regular occurrence in Polynesia be due to American migrations of 500 A.D. and later. Other objections to Heyerdahl's hypothesis have also been raised. We shall not discuss them further, but rather essay a few remarks of our own; not as an attempt at detailed criticism, but rather to bring to the fore what we believe to be important as a matter of principle in appraising diffusionistic theories. When a point of detail is raised, this is only done to furnish an illustration by a specific example.

Strictly speaking, a question like "where did the Polynesians (or any other people) 'come from' ", must fall apart into a number of separate questions, viz.: "What racial, linguistic and cultural influences have operated on the population of a given area?" The population in question may well be an amalgam of several races, and have undergone the influences of the language and culture of yet other peoples.

Only when the *racial features* are very distinct (e.g. the negroes of North America), do they furnish an evident and unmistakable indication of provenance. In areas where the picture is less simple — Polynesia is such an area — one all too frequently falls back on highly subjective judgments, such as "The Polynesians look very much like" Caucasians, or Mongoloids, or a mixture of both. No wonder that scholars are overjoyed when it seems that physical anthropology at last furnishes them with a more rigid and scientific criterion, in the analysis of human blood-groups. We shall speak of these presently, but it is, I believe, correct that classification by blood-groups has not yet sup-

planted the rather rough-and-ready classification by colour: whites, blacks, and yellow-browns, which very often fails us in the by no means infrequent borderline cases.

Cultural features, particularly those of non-material culture, can only be used with great care as an index of diffusion or migration. In the first place because they can hardly ever be considered simply as "customs", peculiar traits which may be isolated from their context and moved about the globe at will. A cultural feature, considered not as a "custom", but as an integrated particle of its whole cultural milieu, has its purpose and its history within that milieu; and the more fundamental and better integrated a cultural element is, the less permissible it is to theorize about its diffusion, without thorough knowledge of its function and history in both the supposed lending and receiving cultures. Next, there is the fallacy of concluding that two peoples are, or are not, related, because they have, or have not, such features as "divine kingship" or "matriarchy" in common. The weak point in such reasoning lies in the fact that "divine kingship", "matriarchy" etc. are blanket terms, covering such a tremendous variety of phenomena, that the so-called "matriarchy" of one society generally has quite different features, and in all probability had a totally different history (if we knew it), from that of another.

If it is very hard to obtain satisfactory results by comparing such cultural features, there are two types of reasoning from which, in our opinion, it is impossible to derive any benefit whatever. The first is the argument based on "mental traits", e.g. "the very noticeable temperamental distinction between the morose and reserved Malays and the laughter-loving and eloquent Polynesians also applies to the aborigines of Northwest America". (Heyerdahl (7), p. 91). Heyerdahl himself wisely prefaces this observation with the sentence: "Too little is known about the development and inheritance of mental traits to use them as an argument for racial kinship". The second is the appeal to sentiment: "Are we to suppose that the courageous Polynesian warriors abandoned *all* their own settlements and made off upon the arrival of small Malay people from the Asiatic mainland?" (p. 31) is an example. There is too much purely subjective evaluation in such an argument to make it at all acceptable. To tackle questions of diffusion by comparing elements of material culture is far more practicable, and therefore we shall later on mainly consider the suggested American-

Oceanian parallels in material goods. Of course, caution is required in this procedure also, as the occurrence of two completely similar objects in different areas can in itself only prove the diffusion of these objects themselves, and more is needed before we can draw further-going conclusions from such diffusion.

Language can be a very valuable indication. Opinions may differ as to whether a resemblance between the myths, houseforms or fish-hooks of two areas is or is not merely coincidental, but it can never be just a coincidence if two peoples speak languages belonging to the same stock. Furthermore the influence one society undergoes from another, will have to be prolonged and/or intense before it leads to the first society adopting the other's language. The contact needed to introduce a language is very different from that needed to introduce a fish-hook. As language is such an important clue, it is from the linguistic viewpoint that we shall first consider Heyerdahl's theory.

Now the sections on linguistic relationships are the weakest part of Heyerdahl's book, and necessarily so, for their aim is to deny an incontrovertible and undeniable fact, namely that the Polynesian languages are unmistakably Austronesian, i.e. belong to that family which also comprises the other Oceanic languages, i.a. the various Indonesian tongues, and which is possibly connected in some way with the Austro-Asiatic languages of N.E. India and Indo-China. This fact — and it is a fact, not an hypothesis — is really fatal to the whole "Kon-Tiki" theory, for it proves that migratory waves *did* enter and occupy Polynesia from the west, the very possibility of which is denied by Heyerdahl. Thus the whole theory that Polynesia was exclusively settled from America falls to the ground. At most America can have contributed to the make-up of the Polynesian population and culture, and, judging by the language, on a much smaller scale than the regions in the west.

Similarities between Polynesia and America therefore cannot be more than indications of a spread of specific features; they cannot prove an American provenance of the Polynesians. What appears to have led the author of "American Indians in the Pacific" astray, is a fundamentally incorrect starting-point. Possibly misled by the old-fashioned term "Malayo-Polynesian" for "Austronesian" languages, he apparently considered that ultimate Asiatic provenance of the Polynesians, and

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relationship between Polynesians and Indonesians, meant "Polynesian descent from the Malays" (p. 26, 27). In order to disprove that descent, he set out to demonstrate that there was a great difference between the Polynesian languages and Malay. To do so he quotes pronouncements by several, mainly 19th-century, authors (Fornander — who makes the Polynesians come from Arabia — Ranken, Dieffenbach, et. al., but not authorities like H. Kern, Brandstetter, W. Schmidt, or Dempwolff), as to "the absence of Malay words in the Polynesian" (p. 27), or the following: "many (Maori) words have more direct connection with the Aryans of Europe, and even of the West of Europe, than with those of Asia". (p. 28). It is surely superfluous to point out that any conclusion based on such arguments is linguistically unacceptable. We need only remark that the question is not whether Malay and Polynesian have "a few words and sentences" (p. 28) in common, but whether the Indonesian languages and the Polynesian languages are related. That such a relationship exists, and that it is even a very close one, cannot be denied: When Heyerdahl speaks of "the tottering Malayo-Polynesian theory", or says "there are still linguists who occasionally revive the idea of some indefinable Malay connection" (28), he completely misrepresents the actual situation. To minimize this relationship, and pass it off as "indefinable", "exceedingly remote", or "vague" on account of "the absence of true Malay words" in Polynesian languages (28), is like trying to deny the close relationship between Germanic and Romance languages, because there are so few "true German" words in French. Nor does the fact that the Polynesian and the Indonesian languages are related (even closely related) mean that therefore the Polynesians are descended from "the Malays". It does suggest that, like the Indonesians, the speakers of the Polynesian branch of the Austronesian languages came from the homeland of the Austronesian languages, S.E. Asia, and that their route was along the area where Austronesian languages are spoken, i.e. the islands of Oceania¹). It will be remembered that the author raised three main objections to this view: *a.* the impossibility of eastward travel across the Ocean (this objection has been disposed of, for Austronesian languages do demon-

¹) Heyerdahl does admit a common ancestry of "Malays" and Polynesians "somewhere in Eastern Asia in a very remote... period" (p. 29). So he might explain the Indonesian — Polynesian linguistic affinity as resulting solely from the primeval common origin of American Indians (from whom, according to him, Polynesians are descended) and Indonesians. The objection to this would be that no American Indian language, as far as we know, is Austronesian, but Polynesian languages are.

strably stretch out from S.E. Asia to the east). *b.* the chronological gap in the history of such a migration. *c.* racial difference between Polynesians and Indonesians.

The alleged chronological gap has been discussed at length by Heine-Geldern, so that we can be brief on this subject. Heyerdahl said that there is a vast time-span left unaccounted for between the probable arrival in Polynesia ca. 500 A.D., and the departure from the S.E. Asiatic and Indonesian area before metal was introduced there — in an earlier publication (Heyerdahl (4), p. 21) he even spoke of *millennia* unaccounted for; but that was an exaggeration. Heine-Geldern's counter-argument is, that the departure need not be so very early to account for the Polynesians' lack of knowledge of metal-working, for: *a.* in many regions of Indonesia purely neolithic cultures continued well into the Christian era: the site Kalumpang, for instance, bears witness to a neolithic culture in Celebes dateable at ca. 1000 A.D. *b.* even when metal has been introduced, the use of stone instruments by no means ceases. *c.* even if the Polynesians had had some knowledge of metals, they can easily have lost it during their passage through the Melanesian or Micronesian archipelagoes, where the necessary ores were lacking; such cases of cultural loss have demonstrably occurred elsewhere, e.g. in China.

The racial objection to a South-East Asiatic provenance of the Polynesians was the fairly high incidence of blood-group B in Indonesia, and its almost total absence in eastern Polynesia. At first sight this blood-group classification does look like furnishing the definite, clear-cut, and unmistakable racial criterion we are in need of. Closer examination shows, however, that there is a lot about blood-group distribution that we do not yet rightly understand. It is still a fairly new subject of research, and as yet it raises almost as many problems as it solves. For instance, the average occurrence of blood-group A among American Indians is 8 %; but among the Flathead Indians it is 42 %, and among the Blackfoot even 77 %. (Kroeber, p. 159—161); so too much reliance on blood-group data could lead to quite erroneous conclusions. But granting a certain value to such data, we find that the similarity between Polynesians and American Indians is not so very striking if we do not confine ourselves to comparing their percentages for B alone, but consider the total picture. The averages for American Indians are: 91 % O, 8 % A, 1 % B. Some Polynesian data are:

Samoa	58,6% O, 17 % A, 19,4% B;
Hawaii	36,5% O, 60,8% A, 2,2% B;
Tuamotu (East Polynesia)	48,3% O, 51,7% A, 0 % B.

By way of comparison, we give the figures for Sumatra and Melanesia:

Sumatra	44 % O, 23 % A, 29 % B;
Melanesia	54 % O, 15 % A, 20 % B.

We see, then, that although the Polynesians agree fairly well with American Indians as regards their B average, they differ from the latter, and conform closely to the Indonesian and Melanesian norm, in their average for O. So one would have to assume a change in the Polynesians' physical features from whatever continent they came (not to speak of the change undergone by the Polynesians' putative ancestors, the American Indians, whose Asiatic origin is not denied by Heyerdahl). In this connection I think we should take to heart F. M. Keesing's warning against the "naive theories" of unchanging physical characteristics. With other words, one should not imagine a solid mass of Polynesians, with their present-day physical features, moving across the globe nor contrast them with an equally homogeneous group of Malays, also with their present-day features. "The realistic picture has rather to be compounded in terms of genetically complex populations variously isolated and inbreeding, migrating and outbreeding, in multiple ways and over long periods of time, and ultimately producing the racial kaleidoscope of modern days." (Keesing, p. 11).

There is one more point to be discussed before we leave the subject of physical anthropology. Heyerdahl is, in general, content with demonstrating American provenance of the Polynesians, but towards the end of Part V, "Traces of Caucasian-like elements in Pre-Inca Peru", he opens up wider vistas. As we have seen, Polynesians may be tall, have wavy, reddish-brown hair, a beard, an aquiline nose, etc. Heyerdahl calls these features "Caucasian". They crop up again in America: reddish-brown hair was found in ancient Peruvian graves, beards feature in the portrait-ceramics of Chimú, and above all there are myths. Myths about white people with beards, coming from abroad under leadership of the culture hero Viracocha in Peru; myths about white people with beards, associated with Quetzalcoatl, in Mexico; Maya art represents

white people with fair hair, and Mexican art "bearded wanderers". All these verbal and pictural representations are held by Heyerdahl to refer to one "Caucasian-like" people, and they were the Polynesians' ancestors. But, as he looked for the origin of the "Caucasian-like" Polynesians in America, so he looks across the Atlantic for the origin of the "vague Caucasian-like strain" among the Americans; and he finally suggests that the former fair-haired inhabitants of the Canary Islands, probably Kabyles, crossed the Atlantic, trekked through America, gave rise to the impressive cultures of Central America and Peru, and then penetrated into the Pacific and settled Polynesia (p. 344, 345). The Kabyles, then, are the ultimate progenitors of the Polynesians. This flight of pure fantasy should not, perhaps, be watched with too critical an eye, but we cannot help feeling that, in supposing the "Caucasian-like" traits of the Polynesians to be the physical inheritance from one specified people, and then tracing this people back to the Canary Islands Kabyles, Heyerdahl is lending to airy nothing a local habitation and a name. We will only remark that the American data on the white men seem to show several discrepancies. For one thing, Peruvian and Mexican sources speak of white, bearded men, but the Maya codex depicts beardless, blond men. To lump together references to blond men, not bearded, from one area, and references to bearded men, not necessarily blond, from another, and then to say these varying accounts all refer to one people, is surely arbitrary. Then, the American portrayal of these people (fig. on p. 293) shows men with a beard, but with not noticeably "Caucasian" features; and these people wear completely Mexican dress and accoutrements. One of the Maya mural paintings is supposed by the author to depict a battle between the white, "Caucasian", invaders and the native American population (Pl. XXIX). Now it certainly does depict two groups of people, and one of them is white, as we can see very clearly, they being completely naked; but they are not merely white, they are white with grey-ish and pinkish horizontal stripes. Their adversaries, the alleged native Americans, are not, as one would expect, brownish, yellowish or reddish, but coal-black. As an illustration of a battle between "Caucasians" and "Yellow-brown" Americans, the painting does not seem very true to life. Personally, I fail to see any good reason for supposing the Central-American and Peruvian myths and paintings to refer to an actual invasion of "Caucasians". If one who is not an Americanist may venture a suggestion, I would hazard that the legends of the white, cultured invaders are not history, but myths of the well-known culture-hero type, and

that the battle between the whites and the blacks is an equally mythical rendering of the opposition between the two contrasting sides of a dualistically organized universe. Such dualistic contrasts do seem to have been expressed in ancient America, e.g. in the opposition of bird and serpent, condor and jaguar, etc. If this view is correct, an interpretation in terms of historical events is unnecessary. So we have gradually left the field of purely physical anthropology, and come to speak of elements of culture, both material and non-material.

To prove Polynesian contacts with America, several scholars have in the past listed "Oceanic traits" in the cultures of the American continent. Heyerdahl re-considers them all, and adds several new ones, only, of course, regarding them not as Oceanic traits in America, but as American traits in Oceania. The chapters II, VII and IX, in which this whole problem is dealt with, now forms an extremely useful survey of all these features, giving and excellently reasoned précis of the literature on each. The resulting compendium will prove indispensable for all future workers in this field. As was almost unavoidable, though, it has become rather a mixed bag. Some parallels carry conviction, others are almost certainly doomed to be rejected out of hand by experts; quite a number deserve to be thoroughly studied once more. We will only mention a few of the more than one hundred parallels which are examined in the book. For reasons already given, they will be taken mainly from the material culture. First, some comparisons which we did not find convincing.

In a number of cases one gets the impression that Heyerdahl read more into his sources than was actually written. For example (p. 408) he finds a parallel with the New Mexico *kiwas*, subterranean ceremonial chambers, in similar structures discovered on Easter Island, citing publications by Routledge and McMillin for the latter, without mentioning the precise page number, however. In neither work is there anything resembling a description of a *kiwa*-like chamber, the closest approach to it (pp. 274 and 218 respectively) is a description of a burial vault in a natural cave, which was only slightly remodelled by man. Another rather different case of not quite justified use of a printed source is the comparison between Peruvian and Hawaiian myths of a culture-hero or god who clears a path for his people with a rod (p. 724 seq.). For Hawaii, Heyerdahl draws on the so-called "Kepelino traditions". These are a series of Hawaiian myths, compiled by the Hawaiian Kepelino early in the 19th century. Now the introduction to

the printed edition of these myths gives Kepelino's life story, from which it appears that he was a "devout Catholic", who attended a Catholic school from his tenth year, and was a special protégé of the Catholic missionaries. His "stories of the creation, of the origin of death, of the rewards and punishments of the life after death, of the earthly paradise and the flood.... are certainly interpreted after the pattern of Christian teaching" (Beckwith, p. 4, 6). Whatever the truly native foundations of the traditions may be, they would certainly first have to be cleared of their Christian overlay; and a tale written by a Catholic, to render Christian teachings in a Hawaiian manner, can certainly not be used as a native Hawaiian source as it stands. The particular tale of the path-making leader discussed here, is beyond any doubt a version of the Biblical story of Moses leading the Israelites out of Egypt by the pathway across the Red Sea. It can therefore on no account serve as a Polynesian parallel to an American myth; and flood-myths, dealt with a few pages further on (738) are so widely distributed as to be almost (not quite) universal. This brings us to a second type of parallels: those which are not confined to Polynesia and Peru or North-West America, but find counterparts elsewhere as well, thus greatly reducing the need for our assuming a transfer from America to Polynesia. The author considers it likely, that the stone statues of Polynesia (the Marquesas in particular) must be derived from South-American originals, as in these areas the posture of the figures' arms is very similar: vertical upper arms (sometimes drawn back somewhat), lower arms more or less horizontal, the hands meeting on each side of the stomach, or one hand slightly above the other; and "images among peoples in other parts of the world certainly do not adhere to this peculiar posture" (p. 383). Nevertheless, when one inspects the exhibits in an ethnological museum one finds attitudes which are very similar indeed in figures from Ceram, the Sepik area, New Ireland, and Nias, to cite only a few examples; in Nias it is i.a. *stone* figures which show this posture. For that matter, one might even mention Hindu and Buddhist stone statuettes, and the same attitude recurs again in wooden statuettes from many parts of West and Central Africa (see the illustrations).

So also, oval houses, or rectangular ones with rounded ends, are not confined to the Maori and Northwest Coast Indians (686), but occur also in Melanesia and New Guinea (H. Tischner, p. 76 seq., W. Milke, p. 17, 46). The necessity for deriving the knotted string records, or

rather, mnemonic devices, of Polynesia from the well-known Peruvian *quipu* becomes less urgent if we also consider their occurrence elsewhere. Heyerdahl himself mentions the Bontoc of the Philippines, and "China and adjoining sections of the old world" as areas where the rope-knotting device was employed (p. 638). L. Locke, in his standard work on "The Ancient Quipu", stresses its wide distribution, and quotes references to its occurrence in China, India, Tibet, and the Congo. In one form or other, it is also found in Indonesia (Batak, Toradja). A feature of rather the same type, and discussed by Heyerdahl immediately before the *quipu*, is the picture-writing of Easter Island. Here Heyerdahl proves himself to be an adherent of the theories which derive the Easter Island "script" from Mohenjo-Daro. Only, again on account of sea-currents, he considers the route which the Indus Valley script took to reach Easter Island to be westward, i.e. via Africa and America. The pictograms of the Cuna Indians of Panama would then be a relict of the passing of the Mohenjo-Daro script through America. We shall carefully avoid taking sides on a subject which has given rise to such heated controversy. Only it may be of interest to note that, if the Easter Island "script" is a kind of mnemonic device or tally particularly to aid the memorizing of myths, as it is usually held to be, then it is not wholly without its counterparts in the Oceanic area. On Palau (in the Carolines) the gable-boards of the native houses bear what have been called *Bildergeschichten*, pictural representations of the whole course of mythical tales (Krämer, *passim*). The figures are only slightly conventionalized, thus being "illustrations" rather than "signs", but they do constitute a means of noting down or registering traditional tales. Carved boards bearing mnemonic devices are found on the Kei islands, where tally-boards with incised figures, partly conventionalized, are used in trade (Nat. Mus. of Ethn., Leiden, 850/64 and 65); and, most interesting of all, "recent field research among the Iban, proto-Malay people of western Borneo, has brought to light wooden laths, carved with elaborate pictographs by ritual experts, and used as mnemonic devices when young men are learning the traditional words employed in invoking the gods to attend head-hunting and various other rites."²) Whatever may be the value of these comparisons, which we

²) Mr J. D. Freeman, of King's College, Cambridge, who discovered these laths, intends to publish in the near future a full description of these mnemonic pictographs, relating them to the texts which he was able to collect, together with an account of his first-hand observations of the way in which they are used. I am greatly indebted to him for his permission to quote from a letter describing his discovery, before his own publication has yet appeared.

only offer as suggestions for further research, an enquiry into Oceanic parallels does seem less fantastic, and therefore possibly more rewarding, than one reaching all the way back to Northern India and 2000 B.C.

A less controversial point is the feather headdress. Surely the Polynesian specimens need not necessarily be derived from American originals (p. 678), considering the quite frequent occurrence of feather head-ornaments elsewhere in Oceania. For example, Malinowski's "Sexual life of savages" contains photographs of Trobrianders wearing them (pl. 73, 77).

The paragraphs on the provenance of cultivated plants make interesting reading, but in some of them the same type of reasoning is adopted as in the section on chronology, where it was said: *if* the Polynesians originated in the west, they would have brought such-and-such cultural elements, in the first place metal-working, with them. Particularly in the paragraph on the distribution of the gourd does this type of reasoning come to the fore again. Even Emory (p. 126 seq.), who is sceptical as to the importance of connections between Polynesia and America, considers the gourd to be one of the few links between the two areas: it must have been brought from Asia, via Polynesia to America. Heyerdahl, on the other hand, concludes that the diffusion must have been from America, for, if it had come from Asia to Polynesia (and thence to America) the bringers of the gourd would also have introduced into Polynesia "other cultural features of the modern iron age epoch that had engulfed Indonesia and China by that time" (p. 443). Objections to this reasoning have already been outlined in connection with the problems of chronology. (This point of "cultural clustering", as we might call it, is also made when the possibility is rejected of the coconut-palm having spread eastwards without its concomitant, palm-wine; p. 458).

On this subject of parallels between Polynesia and America, the book's weakest point is again in the linguistic section. In the other fields one may agree with the author or one may not, but one always finds him reasonable and thought-compelling. When dealing with languages, however, he too frequently makes glaring mistakes, almost all of them due to his unwillingness to consider the Polynesian languages as members of the Austronesian family, and therefore to draw other members of the family into the comparison. For example, evidence for the relationship between the North-West American Indians and the

Polynesians is supposed to lie in the fact that there is a mythical personage in North-West America called Ma-Kwans, while the Polynesian word for "ancestral god" is Makua or Matua (151). Actually the Polynesian word Matua is related to the Indonesian stem *tua*, meaning "old, ancient". Derivatives of it, meaning "parent" or "ancestor" are met with all over Indonesia. All these words cannot have been derived from the Kwakiutl. In the same way Maori *rangi*, or *ani* in other Polynesian languages, meaning "sky", is supposed to be related to the word *ani*, "heaven", of East Bolivian languages (716). As this Polynesian *rangi* or *ani* is obviously the same word as *langit*, "sky", in Indonesian languages (e.g. Malay), the derivation from South-American languages is impossible. A little later Heyerdahl makes great play with this *rangi-ani* correspondance, when he derives numerous Maori place names ending in *rangi* from Peruvian ones ending in *ani* (e.g. Apaapa-te-Rangi = Patapatani, p. 759). In view of the general Austronesian character of the word *rangi/langit* such correspondences, if they were to prove anything at all, would only prove a derivation of the American names from the Polynesian.

There is one other type of pseudo-parallel which should be mentioned, before we try to evaluate the book as a whole, viz. cultural elements which do, indeed, occur in Oceania and in America; but outside the area from which the settlers of Polynesia are supposed to have come, and sometimes also outside the area to which they are supposed to have gone. An example, already discussed by Heine-Geldern ((1), p. 189) is the "venesection bow". In some parts of the world blood-letting is done by shooting off a small, sharp-pointed arrow at close range on to the blood-vessel that is to be severed. As this practice prevailed in Oceania and in America, it was to Heyerdahl one more proof of American migration into Polynesia (666). The precise areas where the "venesection bow" was employed, however, were besides East Africa, among the Masai: New Guinea, Panamá, and eastern Brazil (Ackerknecht, p. 629 and Steward, p. 691). How a trait occurring in eastern Brazil and New Guinea can prove diffusion from Peru to Polynesia is not clear, unless one assumes a whole series of subsidiary diffusions, for which there is no evidence whatever. In the same way Heyerdahl refers to the American origin of a Polynesian myth (152). The Americans who possessed the myth in question were the Ojibwe and Meno-

³⁾ And the Dog Rib of the far north, but they probably received it some time between 1637 and 1820 (Luomala, 23).

mini, living near Lake Superior!³) (Luomala p. 6, 8). So also stone statues from Colombia (380, 384), a musical bow from Patagonia (669), and ponchos from Mexico (680) are all supposed to have influenced Polynesian culture; and the author mentions, i.e., Rivet as having pointed out yet more parallels. This must refer to Rivet's article (p. 146, seq.) in which a connection is traced between Austronesian languages and the vernacular of the Hoka Indians of California — the author's own conclusion being that this proves Oceanic influence in America. By drawing at random from the North American interior, California, Mexico, Colombia, Brazil and Patagonia one can of course gather quite an impressive set of "American" features with which to compare the Polynesian ones; but such parallels by no means prove a Peruvian pre-Inca or a Kwatiutl migration into Oceania. Furthermore, Bushnell has pointed out an inconsistency in the matter of time similar to this vagary in space. The cyclopean walls of Easter Island are compared with, and supposed to be derived from, those of Cuzco in Peru (p. 386 and Pl. LVII-4); but the Cuzco wall is a late Inca structure, and the settling of Polynesian took place, according to Heyerdahl, during the Tiahuanaco period, long before the Incas.

These remarks are not meant merely as negative criticism, nor are they meant to disprove all contact between Polynesia and America. There is undoubted proof of such contact, the classical example being the breadfruit, the plant which is known in Polynesia by its Quechua name *Kumara*. Among the many other parallels listed by Heyerdahl there are several which the present writer, at least, feels to be almost as convincing. There is, for instance, the other plant migrant, cotton (446 seq.). Apparently the Old World cotton plant is characterised by 13 large chromosomes, the wild American cotton by 13 small chromosomes. Now the domestic cotton used in the cultures of Mexico and Peru had 26 chromosomes, 13 large and 13 small, and was a product of a crossing of the Old World and the wild American genus. The remarkable fact is that the 2 species of cotton growing in Polynesia also have 26 chromosomes, and must be forms of the cultivated American cottons. Less convincing, but probably worth further investigation, is the case of the *totora*. This appears to be the Aymara word for the reed used in making reed rafts, while the word *totara* occurs among the Maori and on Chatham Island as a name for respectively a tree, and a tree mentioned in the songs which are sung during the building of reed rafts (p. 582). Then there are the quite strikingly similar

up-turned flutes of New Zealand and Peru (672), and the much-discussed fish-hooks of Oceania and the North-West American coast (130), and possibly some other parallels as well. Of course in judging doubtful cases an element of purely personal opinion soon comes creeping in: what is a convincing parallel to one person is not necessarily so for another, and in most cases further research is needed before a common opinion can be formed. But, admitting the above-mentioned parallels to be valid (as to the breadfruit and the cotton plant there can be no reasonable doubt), and admitting them to prove that there was some form of contact between Polynesia and America, this does not yet mean that Heyerdahl's theory of a settling of Polynesia from America is proved. In the first place, because plants, fish-hooks, and musical instruments are such "diffusible" elements. If two regions have them in common, this can mean some direct or indirect, voluntary or involuntary, *contact* between the peoples of these two regions, but not necessarily that the one region was entirely *populated* by migrants from the other. In the second place, the usual explanation of the occurrence of the *kumara* in Polynesia was, that the plant and the word were brought back to Polynesia by Polynesians who had, voluntarily or involuntarily, and for whatever reason, visited America. Neither in the case of the *kumara*, nor in any other, do we think that Heyerdahl has disposed of this possibility or convincingly shown that they can only have been introduced into Polynesia by Americans. So, until further facts become known, we must, in forming an opinion whether the contacts between the two continents were due to Polynesians or to Americans, go by probabilities. Heyerdahl's thesis that eastward sailing across the Pacific must be ruled out a priori because of the adverse winds and currents, is refuted by the fact that the Austronesian languages reached Polynesia, and can only have done so by coming from the west.

Another reason why Heyerdahl rejected the possibility of a migration into Polynesia from the west, was that the technique of metal-working was not introduced into Polynesia. We saw what Heine-Geldern's answer to this objection was; but we may also observe that it is a form of reasoning that cuts both ways. If ancient Peruvians had colonised Polynesia, one would expect to find pottery, textiles, and also the art of metal-working in that area, but one does not; this is particularly surprising as the ceramic and the textile crafts were so very highly developed and of such importance in pre-Inca Peru. When one assumes an immigration from the west, one has always to reckon with the

possibility of special skills being lost during the migratory period, which must have lasted a considerable length of time, possibly centuries, in which a very large area was covered, with varying natural conditions and entailing forms of contact with various peoples. Immigrants from America, on the other hand, would arrive in Polynesia directly, without any intermediate contacts, and without any possibility of spending more than a few months en route. Thus the probability of cultural loss owing to the migration is very slight, and the absence of pottery, ceramics and metal becomes all the more puzzling, if one assumes a settling of Polynesia by natives of America. In fact, we may perhaps even draw a further-reaching conclusion: given the fact that a migration from America would have been rapid and direct, and would leave no scope for any cultural transformation en route, the wonder is not that there are a few points of resemblance between the cultures of Polynesia and of America, but rather that there are so few. On the other hand there is not much in Polynesian culture that is incompatible with an advent from the west by a long and tortuous route and, subsequently, comparative isolation. Of course, this is a rather rough and ready judgment, but, I think, fair enough in principle. And finally, if one has the choice between Polynesians sailing to America, and inhabitants of America sailing to Polynesia, there is surely much in favour of the Polynesians. They, we *know* to be great navigators, and to have been even greater. As to Peruvian navigation, we can only conjecture. Heyerdahl does indeed quote numerous references to sea-going balsa rafts, but they always refer to coastal sailings, and mention is never made of a Peruvian craft being further out to sea than 24 miles or so (e.g. p. 537). On the other hand, it seems likely that the Polynesians, who crossed and re-crossed the eastern Pacific, did not stop dead once they had arrived at Easter Island, but did from time to time reach the American coast.

Taking all in all, we do not think that Heyerdahl's thesis, that Polynesia was settled by the inhabitants of the American North-West Coast and of pre-Inca Peru, has been proved.

However, this does not imply that his book thereby loses its value; we hold it to be a very valuable contribution indeed. In the first place, because the problem of contacts between Polynesia and America is bound to attract further study and research, and in "American Indians in the Pacific" we have almost all the relevant data gathered together, systematically presented and often excellently discussed. This makes

the work practically indispensable in its own field — and of how many books can this be said? Next, it does seem that the great advances made by cultural anthropology in fieldwork techniques for the studying of contemporary societies has withdrawn much of the attention of students of culture from problems of migration and diffusion. Thus that field has too often been left open for unscholarly guess-work and fantasies. Heyerdahl's book, which is certainly not unscholarly, may well have the effect of again focussing interest on the questions of Asiatic and Oceanic migrations. A really competent discussion of his book, and the problems he raises, can only result from the co-operation of experts in several fields. Such a discussion should not set out to prove or disprove somebody's pet theory, but would have to widen its scope even beyond the already wide limits set by Heyerdahl: the entire circum-Pacific area would have to be taken into consideration. The facts and reasonings in "American Indians in the Pacific" furnish an excellent starting-point for such a study, even though many of its conclusions may have to be rejected. Malinowski once wrote: "In scientific prospecting the few grains of golden truth can only be won by the patient washing and rejection of a mass of useless pebbles and sand". In this book there will remain enough gold to make it valuable, even when many pebbles have been cleared away.

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