

# NOTES AND DISCUSSION

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## EARLY CONTACTS BETWEEN POLYNESIA AND AMERICA

A considerable body of corroborative evidence, of a linguistic as well as a cultural order, attests to the authenticity of traditional tales referring to contacts between the islands of Oceania and the American continent during the pre-Columbian era.

In the first place, it is well known that there is close resemblance between some words in the languages of the western watershed of South America and those of Oceania, notably the Polynesian. These similarities have to do with words designating certain cultivated plants and other objects.<sup>1</sup>

If I am not mistaken, the botanist Berthold Seeman was the first to note, in 1866, that the name of the sweet potato (*Ipomea Batatas*, Poirét; *Convolvulus Batatas*, Linnaeus; *Batatas edulis*, Chois) is identical in the Quechua and the Polynesian languages. Many botanists and ethnologists have since emphasized this interesting point.

Here is a detailed study of the facts: in Polynesia, the sweet potato is

Translated by James H. Labadie.

1. Paul Rivet, "Relations commerciales précolombiennes entre l'Océanie et l'Amérique," *Festschrift*, Publication in honor of P. Schmidt (Vienna, 1928), 583-609.

called *kumara*, in the Maori language, in Mangareva, Paumotu, Rapa Nui, and Rarotonga; *kumala*, in Tonga; *kumaà*, in the Marquesas; *'umala*, in Samoa; *umara* or *umaa*, in Tahiti; *uala* or *uwala*, in Hawaii; *ku'a'ra*, in Mangaia.

Outside the Polynesian world, the word penetrated to the Fiji Islands, Sa'a, and Ulava (*kumara*); to Ruk in the Caroline Islands (*kamal*), and to New Caledonia (*kumala*); in Santo, *uara* is the yam.

Is the word strictly speaking Polynesian, or does it belong to a common Malayo-Polynesian stock? I am unable to say. In most of the Indonesian and Melanesian dialects the accepted word for sweet potato differs. However, in certain Indonesian dialects, such as Mon Khmer and Papuan, and even in some languages of India, this plant or similar tubers (the yam and its varieties [*Dioscorea*], the *Plectranthus tuberosus*, the taro [*Colocasia esculenta*], the *Solanum nigrum*) are designated by words which may well be related to the Polynesian word *kumara*. Whatever the relationship among these various words may be, it is a definite fact that the form *kumara* is clearly pan-Polynesian.

In Quechua the story is quite different. The word is limited to the northern dialects of the language, Chinchaysuyu and Quiteño; the southern and central dialects use an entirely different word, *apitchu*. The first text which attests to the northern form of the word is a narration dated June 5, 1582, describing the Cañaribamba region of Ecuador; in a list of plants cultivated by the natives we read "*comales, que quiere decir camotes.*"

The notion that the word *kumar* is indeed peculiar to the northern dialects of the Peruvian Quechua is supported in dictionaries of 1586, 1604, 1614, 1700, and 1754, the form *apitchu* being given for the central and southern dialects.

Modern dictionaries of Ecuadorian Quechua confirm its existence, in the forms *kumar* and *kumal*, in the Kiteño dialect which lacks the form *apitchu*. Only very recently does the northern form appear in the dialects of the south. In 1853, Tschudi knows only the word *apitchu*. Middendorf was the first, in 1890, to put in his Cuzco dialect *'kumara*, with the meaning of "camote blanco." Recently an American botanist has noted that in the villages of San Miguel and Santa Ana *'kumara* designates the sweet varieties and *apitchu* the starchy varieties of the *batata*.

Aymarà, the second language of Peru, has the same word as the Quechua of the center and the south; however, a 1901 list of plants of the region of La Paz, Bolivia, gives *kumar* as the Aymarà name for the sweet

potato. Confirmation of these facts would indicate contamination of the Quechua dialects after the discovery of America.

The word *kumar* penetrated every region in which missionaries introduced Quechua as part of their evangelistic effort: on the Ucayali, in the region of Maynas and on the high Caquetá, in the forms *kumal* and (rarely) *kumai*, which may be a typographical error. Outside the northern Quechua domain but one American language, the Kuna of Colombia, has a comparable word for the sweet potato: *kwalu* (cf. *uwala*, *uala* in Hawaii, *ku'a'ra* in Mangaia).

The fact that these Quechua and Polynesian words are the same has led to speculation as to whether we are witnessing a transmission of a word, after the discovery of America, from America to Polynesia or, conversely, from Polynesia to America. The second hypothesis is impossible since, as I have noted, the word *komal* is cited in America as early as 1582. Unfortunately, I can offer no analogous fact against the partisans of the first hypothesis, unless it could be shown that the Malay word *gumbili*, cited in 1520, is indeed related to the Polynesian *kumara*.

Besides, while we are sure that the sweet potato existed in America before the discovery and certainly at the time of Moche,<sup>2</sup> i.e. 2,823 years ago  $\pm$  500 according to determinations with Carbon 14, we have no comparable proof as regards Polynesia before the arrival of the Europeans; Friederici thinks that the plant may have been introduced into Oceania with its Quechua name by the Mendaña expedition to the Ellice Islands in 1568. This suggestion seems to me inadmissible. The fundamental role played by the sweet potato in the social life and myths of the Oceanian archipelago would seem to indicate that it had been known in the distant past. In the second place, it is hardly likely that Mendaña and his companions would have called the sweet potato by a name taken from the northern Quechua dialects, since the Spanish Americans had already adopted both the word *batata*, borrowed from the Haitian language, and, even more widely, the word *camote*, from the Mexican Nahuatl. Lastly, it is unlikely that a word imported so recently would have become pan-Polynesian. In this case, it would doubtless have been localized in a few dialects, as was the case with *camote*, introduced into Oceania beyond the shadow of a doubt by the Spaniards and restricted to the Subanu language of Mindanao (*camote*) and to the Marianas (*kamut*).

Thus it seems to me logical to admit that the use of identical words for

2. E. Yacovleff and F. L. Herrera, "El Mundo vegetal de los antiguos Peruanos," *Revista del Museo nacional*, Vol. III (Lima, 1934), pp. 241-322; Vol. IV (1935), pp. 29-102.

the sweet potato in Polynesia and in a restricted region of America, unless it results from a highly unlikely coincidence, can be explained only by pre-Columbian relations.

Friederici<sup>3</sup> has cited similar examples in the names of the yam, the taro, and the sweet potato in Oceania, and that of the *batata* in the Mučik language of the Peruvian coast. This root, which seems based on an ancient word, *kapa*, is found in more or less similar forms in Polynesian, in Australian, in Austro-Asiatic, where sometimes the initial *k* becomes *g* or *h* and very often disappears, giving such forms as *ubi*, *obi*, *obe*, *up*, *ep*, *ape*, while the intervocalic *p* becomes *b*, *v*, *w*, *f*, *h*, or even disappears.

Now, in Mučik, the sweet potato was called *op* or *open*, a word which has become *apene* in the modern dialect. The form *op* fits perfectly into the Oceanian linguistic ensemble: *open* and *apene* are probably examples of secondary lengthening, and one is inclined to wonder whether the Quechua *apitchu* shouldn't be linked to them, with *chu* possibly a suffix.

A third instance of botanical linguistic interest was noted by C. F. and R. C. Cook in 1918.<sup>4</sup> *Hibiscus tillaceus* Linnaeus, like the sweet potato, is known in America and Oceania; its Polynesian name is *mao*, *mau*, *au*, *kau*, *fau*, *vau*, becomes *moanua* on Easter Island. In America the word is found designating the same plant or similar textile fiber plants: *Hibiscus tillaceus* L.; *Hibiscus elatus* Sw., *Hibiscus arboreus* Dev., *Thespesia populnea* Soland, *Sterculia caribaea* R. Rr., *Sterculia ivira* Sw., *maho*, *mahot*, *mahu* in the Antilles, Surinam, and Guiana; *maxagua*, *maxaguo*, *emaxagua* in the Antilles, Colombia, and the region of the Orinoco; these become *damaahagua*, *da-maagua*, *de-maxagua* in certain of the Antilles, in Columbia and the upper Amazon, *huamaga* in Ecuador.<sup>5</sup>

An ethnographical and linguistic detail of the same order, noted in 1880 by A. Lesson, has to do with the word denoting the "ax" in Polynesian and in Araukan. Here are the different forms found in the various Polynesian dialects:

3. Georg Friederici, "Ein Beitrag zur Kenntnis der Tuamotu-Inseln," *Mitteilungen des Vereins für Erdkunde zu Leipzig für das Jahr 1900* (Leipzig, 1911), pp. 97-176; "Wissenschaftliche Ergebnisse einer amtlichen Forschungsreise nach dem Bismarck-Archipel in Jahre 1908. II. Beiträge zur Völker und Sprachenkunde von Deutsch Neuguinea," *Erganzungsheft, No. 5, Mitteilungen aus den deutschen Schutzgebieten* (Berlin, 1912).

4. O. F. and R. C. Cook, "The maho or mahahua as a trans-Pacific plant," *Journal of the Washington Academy of Sciences*, VIII (1918), 153-170.

5. Georg Friederici, *Amerikanistisches Wörterbuch, Abhandlungen aus dem Gebiet der Auslandskunde*, Band 53, Reihe B, *Völkerkunde, Kulturgeschichte und Sprachen*, Vol. XXIX (Hamburg, 1947); Francisco J. Santamaria, *Diccionario general de americanismos*, 3 vols. (Mexico City, 1942).

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toki	}	ax: Maori, Tonga, Futuna, Niue, Ueva, Nukuoro, Fotuna, Tongareva, Mangaia, Mangareva, the Marquesas
		iron hatchet: Paumotu
		stone ax: Rapa Nui
		shell hatchet: Nuguria
toi		hatchet: Tahiti
koi		hatchet: Hawaii
to'i		hatchet: Samoa

This word is clearly related to a Malayo-Polynesian root having the meaning "to strike," but in the form *toki* and meaning "ax" it is, like *kumara*, definitely Polynesian and pan-Polynesian. Now, in Araukan, *toki* designates both the "stone ax," which is the insignia of the chief, and, by extension, the "chief" himself. Since the word is cited as early as 1606 with the meaning of "ax," any hypothesis of post-Columbian borrowing must be rejected.

Thus, in Peru, in Chile, in the Antilles, and in the northwest part of South America, are found four examples of isolated words used in common with the Oceanian and, more precisely, the Polynesian. There is every indication that these are the result of pre-Columbian borrowing. This hypothesis of contact between Oceania and America, before the discovery of the New World, is confirmed by other facts and by traditions.

In Chile, on the island of Chiloé, in Llanquihue, Valdivia and Araujo,<sup>6</sup> in Peru,<sup>7</sup> in certain regions of Mexico, the Polynesian style of oven is used. This oven, a most characteristic element of Polynesian civilization,<sup>8</sup> is a deep one, made by digging in the ground a pit to hold glowing hot stones, on which are laid foods (tubers, fish, mollusks, meat) wrapped in leaves. The pit is then filled with earth; after a time the foods are cooked, then eaten at a banquet by guests who show a joyous gusto so special that one is reminded of a ritual feast, a sort of medieval revelry or a saturnalia.

6. Rodolfo Lenz, *Diccionario etimológico de las voces chilenas derivadas de lenguas indígenas americanas* (Santiago, 1904-1910, pp. 228-9; Galvarnio Ampuero, "Repertorio folklórico de Chiloé," *Archivos de folklore chileno*, fasc. 5, no. 5 [Santiago, 1955]), pp. 54-7.

7. Ernesto Bonilla del Valle, "Pachamanca jaujina," *Turismo*, 9th year, no. 119 (Lima, May, 1955), p. 6; Manuel E. Ramirez, "Trabajen! Escarba de papas. Pachamanca i amores de campo," *Sarasara*, 2d year, no. 11 (Coracora, May, 1943), pp. 9-13; Enrique Palavecino, "Los Indos Uru de Iruito," *Runa*, Vol. II (Buenos Aires, 1949), pp. 59-88; Sergio Quijada Jara, "Algunas comidas típicas del valle del Mantaro," *Archivos peruanos de folklore*, 1st year, no. 1 (Cuzco, 1955), pp. 86-93.

8. J. Macmillan Brown, *The Riddle of the Pacific* (London, 1924), p. 265.

The Polynesian name for this oven, *umu*, is not used in America; in Chile the Mapuche word *curanto* (*curantu*) is used, in Peru the Quechua *pacamanka*, and among the Urus of Iquito the word *wajana*.

The ideograph writing of the Huna and Catio<sup>9</sup> Indians of Colombia, of the Venezuelan Chakés<sup>10</sup> and of the Quechua and Aymará Indians of the high Peruvian-Bolivian plateau<sup>11</sup> offers analogies to the writing system of the Easter Islanders, as has been suggested by Eric von Hornbostel<sup>12</sup> for Kuna writing and Thor Heyerdahl<sup>13</sup> for Chaké writing.

Artifacts clearly of Polynesian design, called in Polynesian *patu-patu* or *meré* have been found in various regions of America. Twenty-one such objects are now known: one was found in a mound of the Arkansas River region in Colorado, one in California, one in the state of Washington, two in Michigan, three in Oregon, two in the Fraser River basin of British Columbia, one in Nootka Sound, two on Vancouver Island,<sup>14</sup> one in Mexico, three in Peru, two in Chile, one at Villavicencio and one in the Limay River basin in Argentina; it is not impossible that from this last were derived the "cephalomorphic keys" used in Chile and nearby Argentine regions, as Imbelloni<sup>15</sup> has suggested.

Wooden clubs identical to those of the South Sea Islands have been found in Peru and among the Tlinkits; a mask which one might guess to have come from New Ireland was dug up in an ancient tomb on the Atacama coast. These discoveries, like that reported by Father Simon of a ship whose form is unknown to the area in a digging near Callao, Peru, might well have resulted from the fortuitous and occasional arrival of Oceanians in America.

But the introduction of new words cannot be explained in this way; it

9. Erland Nordenskiöld, "Picture-Writings and Other Documents," *Comparative Ethnographical Studies*, Vol. VII (Göteborg, 1930).

10. J. M. Crucent, "Notes on Venezuelan Archaeology," *Selected Papers of the XXIXth International Congress of Americanists*, New York, 1949, Vol. III (Chicago, 1952), pp. 280-94.

11. Dick Edgar Ibarra Grasso, *La escritura indígena andina* (La Paz, 1953).

12. Eric von Hornbostel, "Chinesische Ideogramme in Amerika," *Anthropos*, Vol. XXV (St.-Gabriel Mödling, 1930), pp. 953-60.

13. Thor Heyerdahl, *American Indians in the Pacific* (London, 1952), pp. 637-38.

14. One of these precious objects from Vancouver Island was given by the sculptor Lipschitz to the Musée de l'Homme, where it was inexplicably placed in the Oceanian collection rather than in the American.

15. J. Imbelloni, "On the diffusion in America of onewa, okewa, paraoa, miti and other relatives of the meré family," *Journal of the Polynesian Society*, Vol. XXXIX (Wellington, December 1930), pp. 322-45; "Una arma de Oceania en el Neuquén. Reconstrucción y tipología del hacha del río Limay," *Humanidades*, Vol. XX (La Plata, 1930), pp. 293-316.

presupposes closer and probably regular contacts. Would it after all have been surprising if the Polynesians, the most prodigious navigators on earth, had pursued their travels as far as the shores of America? Perfectly familiar with currents and winds, able to steer a course by the stars, they sailed at night and regularly made trips of 2,000 miles, sometimes even 4,200 miles, without putting ashore. To find the tiny Polynesian islands lost in the immensity of the Pacific they were guided by the small cloud which forms above each island at a height of over 11,000 feet and which is perceived by a practiced eye from a distance of 120 miles. Their double canoes, pirogues, made seven to eight miles per hour, 75 miles in a ten- to twelve-hour day; thus one of these boats could have covered the distance from Hawaii to California, or from Easter Island to the South American coast in twenty days. And, as a matter of fact, Indian traditions or legends tell of the arrival of strangers on the American coast. Stories of invasion by giants are told in Colombia, Ecuador, and Peru; in Chile we hear of pirates come from the East Indies.

On their side, Polynesian traditions speak of lands situated beyond Easter Island. Caillot writes of the Mangarevians: "According to their tradition, they sailed even to America, to Taikoko and to Ragiriri which, if one is to believe the natives of the Gambier Islands, would be the region of Cape Horn and Le Maire Strait, or perhaps the Straits of Magellan: both these regions are reputed to have been well known to their ancestors but not discovered by them; for a Havaiki chief named Anua Motua, later king of Mangareva, is supposed to have gone there first; emigrating with the Gambier Islanders, and sailing further than he had intended, he is supposed to have shown them the route to these straits, which they say their own ancestors later retraced several times. And in fact it would not have been impossible for them to sail to Cape Horn and the Le Maire or Magellan Straits, since the distance is scarcely greater than that from Mangareva Island to Matakiteragi or Easter Island, which they say they often visited." The story of Anua Motua's voyage to Taikoko and Ragiriri contains details on the climate, the state of the sea, the height of the sun, which leave no doubt about the authenticity of Caillot's proposed identification.

These visits, whether of single ships or large groups, led the people of the western coast of South America to an awareness of lands situated far to the west. It is sure that some of these lands were the Chincha and Galapagos Islands, but it is equally sure that others were inhabited Poly-

nesian islands from which, in the pre-Columbian era, strange people came in large canoes to trade with the Peruvian Indians and to which, according to certain bits of testimony, these Indians then sailed. They left from the ports of Arica and Ilo and were reportedly at sea for about ten weeks.

In addition, there is a seemingly incontestable tradition, traced to coastal traders of the time, that a king of Peru, Tupac-Inca-Yupanqui, one of the last Incas and grandfather of Atahuallpa, organized an expedition to these distant islands.<sup>16</sup> For his purpose he equipped a fleet of *balsas* and chose the most experienced pilots. We know that the western coast of South America was then the site of a flourishing trade, using the boats called *balsas* by the Spaniards.

The *balsa* was a raft built of an odd number of beams of a very light wood (*Ochroma piscatoria*); there were ordinarily five beams, sometimes seven, nine, or even more. Attached to two transverse beams, these five were of decreasing length outward from the center so that a sort of prow was formed; the ends of the beams were straight across the stern, however, which was as wide as the center of the craft. A raised second layer of beams somewhat protected passengers and merchandise from sea water. The parts were lashed together with pliable lianas or agave cords. Masts and jibs were also of light wood, sails of cotton, ropes of agave fiber; a large stone shaped like a grindstone served as an anchor. The helmsman sat at the stern, maneuvering the craft with a rudder; the oarsmen were far forward; the sail was rectangular. These *balsas* could easily carry fifty passengers and drew up to thirty tons. Benzoni has fully described one of their embarkations.<sup>17</sup>

Tupac-Yupanqui's expedition is said to have comprised 20,000 men, a fleet of 400 such boats. Some say it took nine months, others a year, and reached the island of Aguachumbi (or Haguachumbi) and Ninachumbi. The fleet brought back black prisoners, great quantities of gold and silver, a brass or copper throne, and a skin and the jawbones of an animal resembling a horse; these trophies were kept in Cuzco until the Spanish conquest. The names given to these islands provides no clue to their identity, whether we attempt a Quechua interpretation (*ahua-cumbi*, belt of woven cloth, *nina-cumbi*, slim precious belt) or a Mučik one (*ain-chomi*, *alla-lobo* de mar,

16. Miguel Cabello Valboa, *Miscelanea antartica. Una historia del Peru antiguo* (Lima, 1951), pp. 322-24; Richard Pietschmann, "Geschichte des Inkareiches von Pedro Sarmiento de Gamboa," *Abhandlungen der königlichen Gesellschaft der Wissenschaften zu Göttingen, Philologisch-historische Klasse*, new series, Vol. VI, no. 4 (Berlin, 1906).

17. Girolano Benzoni, *La historia delMondo Nuovo*, folio 164, verso (Venice, 1572).



*nicna-chomi*, adentro lobo de mar), this last etymology seeming quite improbable.<sup>18</sup>

Since it is certain that these islands could have been neither the Galapagos nor Juan Fernandez Island, which were never permanently settled,<sup>19</sup> they must have been Oceanian islands. If it were to be confirmed, a tradition among the Mangarevians quoted by F. W. Christian<sup>20</sup> would indicate that the expedition of the Inca king reached the Gambier archipelago. Here is Christian's report: "The Mangarevians tell of a chief called Tupa, a red man, who came from the East with a fleet of raft-like ships which were not of the Polynesian type." Everything in this account, the description of the boats, the name and the description of their chief, the direction from which they came, ties in with Tupac-Yupanqui's expedition.

It is by no means outside the realm of possibility that the Inca chief should have reached these islands in four months. The balsa wasn't nearly so remarkable an instrument of navigation as the pirogue with gimbals, but its good nautical qualities, recognized by ancient authors, would readily have permitted long voyages on a sea as calm as the Pacific often is in the tropics. Without attempting a comparison between the balsas and the Spanish ships, it is interesting to recall that Alvaro de Mendaña's expedition, which left Callao November 19, 1567, reached the Ellice Islands on January 15, 1568; this is 50° longitude west of the Gambier archipelago, about twice as far as the distance between Peru and the Gambiers. It will be recalled that the balsas drew up to thirty tons and that Mendaña's ships couldn't have been much larger, if we are to judge by the two ships used by Pizarro in the discovery of Peru; these drew forty and sixty tons respectively.

18. The word "chumbi" forms part of the name of certain natives of Lambayeque belonging to the mučik group: Efui-chumbi, Cocras Chumpi, Farro-chumbi, Coscu-chumbi. Cf. Rubèn Vargas Ugarte, "Los Mochicas y el cacicazgo de Lambayeque," *Actas y trabajos científicos del XXVII: Congreso internacional de Americanistas, 1939*, Vol. II (Lima, 1942), pp. 475-82.

19. The Galapagos were doubtless temporarily inhabited, for early navigators discovered very ancient hearths in grottoes there "... no hallaron en ellas ningun indiana, pero si varias cuevas con vestigios de antiquisimos fogones..." Juan Velasco, *Historia del Reino de Quito en la America meridional*, 3 vols. (Quito, 1841-1844), Vol. I, p. 153. In 1953 Thor Heyerdahl discovered at James Bay, in two valleys of Santiago Island, and on Santa Cruz and Floreana Islands, bits of pottery which bear a resemblance to the Chimu ceramic work of the Peruvian coast and to the pottery of the Ecuadorian coast; these discoveries show that the above information is correct: Alfred Métraux, "Découvertes archéologiques aux îles Galapagos," *Journal de la Société des Américanistes*, new series, Vol. XLII (Paris, 1953), pp. 417-18; Thor Heyerdahl, "Preliminary Report on the discovery of archaeology in the Galapagos Islands," *Anals do XXXI Congreso internacional de Americanistas*, Vol. II (São Paulo, 1955), pp. 685-97.

20. F. W. Christian, "Early Maori migrations as evidenced by physical geography and language," *Report of the sixteenth meeting of the Australian Association for the Advancement of Science, Wellington meeting, January 1923* (Wellington, 1924), 523-35.

The feat of Thor Heyerdahl and his five companions who, from April 28 to August 7, 1947, crossed the Pacific from Callao to Raroia Island in the Tuamotus on a raft similar to the Peruvian balsa, confirmed the fact that the east-west crossing is possible under the conditions reported for the Inca emperor.<sup>21</sup> An American, M. Willis, recently made the same journey.

Whatever one may decide about the credibility of the Inca story, all the facts and testimony indicate that America was no more ignorant of Oceania than Oceania was of America, and that more or less regular relations of a commercial nature united the two worlds. It is certain that, thanks to these commercial relations, cultural elements and useful plants passed from one continent to the other; sometimes the names were transplanted as well, as in the cases of the sweet potato, *Hibiscus tiliaceus*, or the ax; sometimes, on the other hand, names did not accompany the exchange.

One is tempted to suggest the same explanation for the presence in Oceania and in America of the yam (*Discorea alata*), the calabash (*Lagenaria seceraria*), cotton (*Gossypium sp.*)<sup>22</sup> and the coconut (*Cocos nucifera*), all of which are undoubtedly pre-Columbian plants. It is, however, difficult to attribute them with certainty to the Polynesians, since we have seen that the Melanesians also contributed to the populating of America, and they surely did not come empty-handed. To determine exactly the details of these two contributions of Oceania is a delicate matter which can be established only by considering the dates at which each reached the American continent, since it is quite certain that the Melanesians preceded the Polynesian traders by a long time. Thus for each fact we must refer to the presumed date of its introduction to America.

The yam is mentioned by the first Spaniard who disembarked in the Antilles,<sup>23</sup> the calabash and cotton were used by the occupiers of Huaca Prieta at the mouth of the Chicama valley on the Peruvian coast, that is, 2,966 years ago  $\pm$  300 according to measurement by Carbon 14.<sup>24</sup>

Though the existence of the coconut in America before the arrival of the Spaniard had long been discussed, the remarkable studies of Friederici<sup>25</sup>

21. Thor Heyerdahl, *The Kon-Tiki Expedition by Raft across the South Seas* (London, 1950).

22. George F. Carter, "Plant Evidence for Early Contacts with America," *Southwestern Journal of Anthropology*, Vol. VI, no. 1 (Albuquerque, 1950), pp. 161-62.

23. *Ibid.*, pp. 165-66.

24. Junius Bird, "Radiocarbon Dating," *Memoirs of the Society of American Anthropology*, no. 8 (Salt Lake City, 1951).

25. Georg Friederici, "Die Heimat der Kokospalme und die vorkolumbische Entdeckung Amerikas durch die Malayo-Polynesier," *Der Erdball*, Vol. I (Berlin, (1925), pp. 71-77.

definitely answered the question in the affirmative. From these facts we believe that it may be deduced that the coconut and the yam were introduced to America by the Polynesians, and that cotton and the calabash were brought by the Melanesians. It remains to be shown in what direction the transmission of all these plants took place.

For the coconut, no doubt is possible. Friederici has shown that the earliest European conquerors found it only in limited zones of the Pacific coast and never saw it on the Atlantic slope. Everything thus tends to prove that it was then of recent importation and had not had time to spread over the continent. Besides, the origin of this palm is definitely shown by the discovery of its remains in Pliocene or pre-Pliocene sites in New Zealand.

As for the calabash, we know that it was known to the Indians of the Peruvian coast from the earliest era (Huaca Prieta), while those of North America and the Antilles were ignorant of it. This distribution would seem to indicate that it was introduced from Oceania into America.<sup>26</sup>

For the sweet potato, the question is more difficult, since equally eminent botanists have come out in favor of both American and Oceanian origin. Linguistic facts seem rather to support the latter. While *kumara* is clearly pan-Polynesian and *kapa* pan-Oceanian, both words are found in but limited regions of America. This leads one to think that the borrowing was made by America from Oceania. G. F. Carter seems to lean toward the same conclusion as regards the yam.

As for cotton, the science of botany provides us with precious and precise details. The cotton of the ancient world, wild as well as cultivated, possesses thirteen large chromosomes,<sup>27</sup> while wild American cotton has thirteen small chromosomes. A third variety, including two American species and one endemic to Hawaii, possess twenty-six chromosomes, thirteen large and thirteen small. This obviously resulted from a crossing of the first two. All of this may be explained as follows: cotton, born in Asia, passes to America about 1,000 B.C., is then reimported after hybridization, from South America to Polynesia.<sup>28</sup>

Need I point out how much more satisfying the hypothesis of human

26. Erland Nordenskiöld, "Origin of the Indian Civilization in South America," *Comparative Ethnographical Studies*, Vol. VII (Göteborg, 1930), pp. 27-30.

27. Chromosomes are more or less spherical granulations, more or less lengthened rods, or thin filaments often V- or U-shaped, existing in sexual cells.

28. Carl O. Sauer, "Cultivated Plants of South America and Central America," *Handbook of South American Indians*, Bulletin No. 143, Vol. VI (Washington, Bureau of American Ethnology, 1950), pp. 487-543.

intervention is in these matters than that of the transmission of seeds by sea currents, an explanation which, by the way, could not be applicable to the sweet potato, the yam, or cotton?

Definitely, then, the Pacific should no longer appear to us as an immense empty space, an impassible barrier between the ancient and the new worlds. Human migrations crossed the barrier, at the price of untold effort and unknown drama, reaching and colonizing America; then bold traders crossed it more or less regularly, doubtless in both directions, up to the age of discovery. Long before the ships of the great European discoverers, the amazing Melanesian and Polynesian pirogues, perhaps also the primitive Peruvian balsas, had blazed a trail across those immense maritime wastes. Such is the story of humanity.

Although the study was for a long time neglected, we are gradually coming to realize the primary importance of water migrations not only in the populating of America but in the history of mankind as a whole. At the International Congress of Americanists in New York in 1949, after expressing my pleasure at seeing American scholars accept the possibility of the populating of the New World other than by way of Bering Strait and the Aleutian Islands (a hypothesis which they had rejected up to that time), I added:

“Migrations by water (river routes and coastal trade) have played an essential role in the history of mankind, probably a greater role than land migrations. Man had no sooner seen a floating tree trunk than he conceived the idea of attaching several together with vines after squaring them off a bit, constructing a primitive raft; it provided greater protection for family and possessions, as well as a remarkable saving in energy for moves and voyages. The risks involved were undoubtedly much less serious than those awaiting man in dense jungles and primeval forests, while at the same time he was spared the labor of carrying everything on his back. Primitive man’s travel lanes, which ethnologists have tended to look for on the great land masses, were often river and sea lanes, and the Pacific as a link between the Old and the New Worlds has been too long misunderstood. It is sure that a heavy coastal trade existed in the pre-Columbian era all along the Pacific coast, and that cultural exchanges took place through this means and in both directions; it was in this way, for example, that Mexico took all its metallurgical techniques from Peru.”<sup>29</sup>

Contrary to what might be supposed *a priori*, and to the Euro-centric

29. Paul Rivet, *Selected Papers of the XXIXth International Congress of Americanists, New York, 1949* (Chicago, 1952), Vol. II, p. 16.

idea which influenced research for centuries, the peopling of America was effected from the West and not from the East. The Atlantic remained almost inviolate until the great voyages of discovery, and was crossed only in the extreme north, after the prehistoric period; the epic of the Vikings had no lasting effect on the aboriginal natives. The Atlantic formed a veritable wall between the Old and New Worlds. The western shores of America were on the other hand open to multiple migrations along their entire length. Far from being an obstacle, the Pacific was a link between the Asiatic and Oceanian worlds and the New World. The eastern coast of America was a façade with neither doors nor windows; the western shore was wide open.

Another fact emerges from the preceding pages. The New World has been since prehistoric times a center of convergence for races and peoples, quite unlike southern Asia which, in the present state of our knowledge, appears to be a great center, if not *the* great center, of human dispersion.

Is it not remarkable that the historical period of American evolution should be but the repetition of ethnic events which doomed its own population? Since the discovery, America has continued to be a center of attraction for the most diverse peoples and races, as it had been during its long pre-Columbian period of formation. On the one hand, the blending of these peoples and these races has served since the fifteenth century to form a new civilization with its own clearly defined characteristics and its own individuality, in its works inspired by Old World culture as well as in its independent creations; on the other hand, the American Indian, reaping the heritage of the peoples and races which contributed to his formation, was able to develop his own civilization out of this common fund and enrich it with a series of creations and inventions worthy of comparison with those of the Old World.

Great civilizations were built up in the regions most favorable to human development, on the high plateaus of temperate climate which characterize the Andean *cordillera* from Mexico to Chile. Surprisingly original forms of government, such as that which directed the Incan empire, united under one domination diverse peoples by means which recall the strong and supple political organization of the Roman conquest. An architecture and a system of decorative art independent of any external influence were born; daily we see new proofs of this in the ruins of Mexico, Yucatan, Peru, and Bolivia. Technical procedures of astonishing perfection were discovered; ceramics, metal-working, weaving. American potters equalled those of the Old World in their mastery of plastic design, the variety of

their forms, and the decoration of their works. The metallurgists of the high Bolivian-Peruvian plateau discovered brass and bronze; those of the Peruvian coast knew silver and its alloys. Columbian work in gold and its alloys reveals works of surprisingly complex technique. Veneering, coloring, autogenous welding, lamination, wire-drawing, lost wax processes—none of these was unknown to pre-Columbian artisans.

With the same adroitness the Indians used the pen, wove cloth, sculptured in stone, modeled in clay and stucco, worked hard stones, made convex and concave mirrors of pyrite or obsidian. In Mexico and Yucatan they developed a system of hieroglyphic writing comparable to the Egyptian system, but as independent of it as the American pyramid is independent of Pharaoh's. Their manuscripts, often found in the form of calendars, like the Peruvian *quipu*, reveal extraordinary astronomical knowledge and the existence of the decimal system among the Incas. The Peruvians used the beam balance, knew the steelyard balance, as did the Indians of the Ecuadorian coast, of Antioquia, and Pacabueyes of Colombia. The astronomical knowledge of both Mexicans and Peruvians is astonishing.

The narrow range of American *fauna* rather than lack of skill among the Indians should be blamed for their small number of domestic animals: the llama, the alpaca, the peccary, the guinea-pig, the Muscovy duck, the turkey, two species of bees. This is confirmed by the numerous discoveries they made and utilized among their singularly rich flora. The list of plants cultivated by American aborigines is impressive: corn, cassava, sweet potato, yam, potato, cocoa, beans, peanuts, Jerusalem artichokes, sunflowers, chenopodium, tomatoes, pineapples, pumpkin, calabashes, maté, Cayenne pepper. They grew a cotton different from that of the Ancient World, used agava textile fibers, smoked tobacco and took snuff, knew the stimulant or therapeutic qualities of coca, quinine, ipecac, and copaiba, and with the latex of certain trees were able to make syringes and balls of rubber. Finally, to color their textiles, they used cochineal dyes derived from the opuntia plant.

The above list is far from complete. A large number of other inventions, improvements, and techniques attests to the creative genius and the remarkable qualities of observation of the Indian. It should be noted that all tribes, hunters, and fishermen of the tropical forests as well as the well-organized tribes of the high Andean plateaus contributed to the enrichment of a common, specifically Indian, heritage. Nordenskiöld, using a science whose erudition is movingly blended with a profound love of the

### *Notes and Discussion*

American race, has painted a masterly picture of these conquests and discoveries.<sup>30</sup>

It is right and necessary that both old Europe and young America become aware of their debt to Indian civilization. The contribution of the New World profoundly changed living conditions in both Europe and Africa. Think for a moment of the place occupied in the European economy by the potato, in the African economy by the cassava and the peanut.

If ethnologists sometimes make us smile when they express their regret that the evolution of American civilizations was suddenly halted and broken by the discovery, they have both a right and a duty to call to the attention of everyone who has benefited so richly from the products of these civilizations the part played by the Indian in the modern economy of what are called civilized peoples.

The sentiment of over-all human solidarity needs more than ever to be strengthened and exalted. Every man should understand that, in all latitudes and longitudes, there are other creatures, his brothers—whatever the color of their skin or the texture of their hair—who have contributed toward making his life easier and more rewarding.

30. Erland Nordenskiöld, "The American Indian as an Inventor," *The Journal of the Royal Anthropological Institute of Great Britain and Ireland*, Vol. LIX (London, 1929), pp. 275-309.