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Transoceanic Voyaging: How Ancient America Became Civilized

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Last Updated: 2013

Unpublished:

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Introduction

One of the great issues that historians and scientific researchers who try to reconstruct humanity's past record have been unable to settle is, did civilization arise in the world just a single time, in the Old World, or also separately in the New World? If it came about twice, the civilizing impulse process may have been a natural process, a result springing more or less inevitably out of human consciousness. If, on the other hand, it arose by borrowing, from one hemisphere to the other, its origin would have sprung from a unique set of circumstances. In that case we would have to consider our civilized heritage a one-time historical accident.

About civilization's beginning in the Old World there is little question. Despite some unsettled details involving chronology and channels of influence, the several areas where civilization came into being the earliest seem to follow a time line that looks as if one center—the Near East—led the way, then stimulated in part parallel developments in other spots—Egypt, the eastern Mediterranean, India and China--according to their distance from the heartland. The big question is about civilization in America. Most archaeologists, anthropologists, geographers and historians have consistently and vehemently maintained that developments in the two centers in the New World that may have reached a civilized level before Columbus' day—Mesoamerica and the Andean zone—did so without significant influence from Eurasia. They hold that this means that humanity at least twice came to a basically similar result, thus that we can hope to determine through examining the commonalities in the two halves of the world how, presumably, civilization came about by natural, evolutionary means.

But enough experts disagree with this position that its unsettled nature continues to trouble scholarship. For example, Gordon R. Willey, prominent archaeologist at Harvard, observed in 1985 that, “No other subject in American archaeology has brought about such heated discussions as the role of Old World contacts.”

Very recent discoveries help us address this challenging question on a firmer basis. To do that involves two analytical steps. The first is to settle the nagging issue: How much, if at all, were ancient American peoples connected with the Old World across the oceans? We shall see that the answer is, to a significant degree: the oceans were paths as much as obstacles. That is a shocking answer for most experts on the human past.

But the second question then remains to be answered: Was such communication crucial in bringing about civilization in the New World? The answer is also positive, it seems to me.

Chapter 1

Framing the First Issue: Were Ancient Peoples Connected across the Oceans?

As indicated a large majority of the acknowledged experts in this field, have maintained that the answer to the question in the chapter heading is no, the two hemispheres were not linked in any significant way. They believe that while a few stray boats may have landed on American shores from the Eastern Hemisphere, no influences of historical significance resulted. (And hardly anybody suggests that ocean-spanning trips went in the opposite direction.) To the contrary, they suppose that once native settlers came across the Bering Strait more than 12,000 years ago, American cultures and civilization evolved in effective independence of developments in the Old World.

A small contingent of contrarians believe that there were significant historical/cultural influences brought by voyagers from the Old World and that they had important effects on the development of ancient American cultures. These “diffusionists” have argued their case passionately for years, but they have had very limited impact on the prevailing position. (Kehoe {1998, 190-201} details some of the social and political reasons why this has been the case.)

This constitutes a classic case of an entrenched scientific paradigm. The concept of paradigms in scientific research has been especially popular since the publication of Thomas Kuhn’s 1962 book, *The Structure of Scientific Revolutions*. He showed that most cases fields of scientific study depend on a set of overarching assumptions about what questions are appropriate to be asked, what methods are legitimate in trying to answer them, and how questions and answers are properly phrased. But, Kuhn observed, occasionally

a set of empirical observations arise that expose a prevailing paradigm as being based on flawed assumptions and incomplete facts. When that happens it becomes necessary to jettison the old schema, opening the door for a revolutionary new question and its explanation to come into play.

A prime example of such a revolution involved the late 19th century notion that a substance, “ether,” filled the immensity of space and was the physical medium through which light was transmitted to earth. A critical experiment conducted in 1887 found that no “ether” could be detected (Milutis 2006). Within a generation, beginning in 1905, a new space-time paradigm was forged by Albert Einstein and others that replaced the old (“Newtonian”) framework.

Other examples of critical moments in scientific theorizing were Louis Pasteur’s experimental proof in 1864 that new life forms do not originate by “spontaneous generation,” and Alfred Wegener’s argument, early in the 20th century, that rather than having been linked by now-sunken land bridges, the continents, which share certain plants and animals, had once been linked but had actually moved apart across the face of the earth. That view, now called plate tectonics, took over thirty years to be generally accepted (Sorenson 2010).

The historical paradigm that assumed that no significant ancient voyages crossed the oceans to or from America met its demise with publication of the article “Biological evidence for pre-Columbian transoceanic voyages” (Sorenson and Johannessen 2004, 2006). The present volume is the next step in constructing a new paradigm for the development of civilization in the two hemispheres.

Argument by diffusionists against the old orthodoxy always depended on the fact that they could point to striking parallels between cultural patterns

known among pre-Columbian societies in the Americas and those in the Old World. But critics wanted more definitive (“hard”) proof and for a long time that seemed to be lacking. Critics argued that most of the parallels cited by diffusionists could be (and were, they claimed) the result of inventive human minds that happened to come up with the parallel, independent results by chance.

Diffusionists countered that some of the cultural similarities were so arbitrary, so specific, and so complex that it was impossible to believe that unconnected peoples had come up with the same ideas twice. For instance Tylor (1878) compared details of an Aztec board game called *patolli* with the *pachisi* game long known in India. He pointed out that the board layout, as well as details of the rules, the sequence of moves, and the cosmic associations of the board markings were nearly identical in Mexico and India. Robert Lowie, an influential anthropologist who was usually very critical of diffusionist claims, granted that in this case “the concatenation of details puts the parallels far outside any probability [of having originated independently]” (1951, 13). Greenway (1977) put the matter even more starkly: “In spite of the geographical distance between India and Mexico, parchesi (i.e., *pachisi*) made its inexorable way half way around the world to Mexico.”

Still neither Lowie nor other orthodox scholars could bring themselves to change their basic position that Old and New World civilizations developed independently, despite challenging points raised by the diffusionists. The usual explanation for the similarities was that since “the human mind” was essentially the same in human beings in every part of the world, if a person could invent a certain device or conceive a particular idea in one location, other humans could do the same thing elsewhere. Increasingly sophisticated knowledge from psychology gave no support for this contention about “the

human mind” (as it had been derived largely from the theory of evolution as phrased in the Victorian era). Neither did the findings of the expanding field of cultural anthropology support this simplistic view of the origin of innovations.

Almost simultaneously with Lowie’s observation anthropologist Alfred Kroeber (1952, 391) gave his colleagues a caution they failed generally to appreciate: “Nineteenth-century anthropologists could still fall back on a sort of spontaneous generation [i.e., “independent invention”] to explain cultural likenesses remote in space or time. Today we hesitate to invoke [this] autogenesis; we shrink from it almost as fervently as do biologists” Yet even Kroeber could not manage to escape from the grip of the paradigm.

What the diffusionists must provide in order to prove their case, the critics insisted, was “hard” evidence, like archaeological finds from American sites of, say, teacups made in China or unequivocal evidence of rice cultivation in the New World. They especially demanded evidence from biology. Herbert Spinden wrote in 1933, “The fact that no food plant is common to the two hemispheres is enough to offset any number of petty puzzles in arts and myths” like the *patolli/pachisi* parallels. Other conventional scholars piled on: “Lack of any Old World food plant [in the New] argues strongly against early transpacific migrations” (Kidder et al. 1946); and “There is no hard and fast evidence for any pre-Columbian introduction of any single plant or animal across the ocean from the Old World to the New World, or vice versa” (Riley et al. 1971). That mantra was repeated verbatim in 1997 in the journal *Current Anthropology*. Moreover, the criticism went, “it does not appear that a single important disease of parasitic type was common” to the two hemispheres (Spinden 1924).

As a matter of fact there was already in the scholarly literature a good deal of proper “hard” data contrary to these points, but it had not been

gathered and argued comprehensively. In the 1990s with a colleague I compiled abstracts of a vast literature (over 5,000 items, occupying 1200 pages) on both cultural and biological parallels between the hemispheres (Sorenson and Raish 1996), including considerable data on shared crops and diseases. This compilation seemed to have no effect on orthodox scholars, so in 2000 I set out to focus on gathering the specific “hard” evidence for transoceanic voyaging that had so long been demanded. With geographer Carl Johannessen I collected and published (Sorenson and Johannessen 2004; 2006; 2009) progressively expanded compilations of data from biology to confirm that pre-Columbian voyages in both directions must have been numerous and had extended over a period of thousands of years before Columbus’s day.

The 2009 treatment of that material in our book *World Trade and Biological Exchanges before 1492* established that for almost a hundred species of plants there is decisive evidence that they lived in both the Americas and the Old World in pre-Columbian times, yet they could not have bridged the ocean gap to grow in the separate halves of the world by any means but being carried across by humans on boats. (For 40 more species, there is some, but not decisive, evidence.) In addition, 20 species of microfauna (causes of disease) were shown to have been present in both hemispheres before Columbus, with a further 20 possible. For larger fauna (e.g., the turkey) evidence for 7 species proves to be decisive, again with others possible. In total the distribution of as many as 125 species of flora and fauna that lived anciently in both eastern and western hemispheres can only be explained by human voyaging.

This perspective agrees with what a few historians are suspecting to be the case. For example, Bentley has said that “premodern history is ripe for . . . reconsideration.” That view derives from a “massive and mounting body of

evidence that human beings are wandering animals that have regularly crossed the boundary lines of societies from earliest days of human presence on the earth.” “Cross-cultural travel, communication, and exchange have been prominent features of human experience” from the beginning (2006, 20-1).

Why the isolationist paradigm was so long and so steadfastly adhered to is not altogether clear. It was not for lack of contrary data. In the 64-page bibliography in the Sorenson and Johannessen 2009 book almost half of the references were 40 years old or more. One important reason for adherence to the independence paradigm’s prejudicial assumptions and faulty “facts” seems to have been sheer lack of curiosity about the unresolved topic, even though curiosity is supposed to be the life-blood of science and scholarship. But maintaining the status quo is a widespread intellectual problem, even (or especially) among scholars. John Kenneth Galbraith (1965) acutely observed about the human condition, “Faced with the choice between changing one’s mind and proving that there is no need to do so, almost everyone opts for the latter.” That the point applies equally to scientists is underlined by the statement of noted physicist, Lord Kelvin, who, just five years before Einstein’s first blockbuster paper was published, famously stated, "There is nothing new to be discovered in physics now. All that remains is more and more precise measurement."

Yet a growing need is felt in some quarters to construct a history of humans that transcends national and continental boundaries. That prospect is theoretically inviting or even necessary, as Bentley (2006) has pointed out, but few scholars are prepared or willing to get on with the task. As Sinologist Victor Mair (2006, 3) has observed, “there is a strong intellectual bias in favor of the proposition that ancient civilizations arose essentially in perfect isolation.” A corollary to that viewpoint is “deliberate disregard of empirical

evidence that demonstrates adoption and adaptation” among societies. But as Mair further notes, academic careers are usually built upon extreme specialization. This results in “blindered scholarship” in regard to broad questions of history. Research agendas are characterized by “a resounding lack of concern” for issues and data beyond each scholar’s geographical area and time period of primary concern. Those “who do occasionally hint at the possibility of [wider] cultural transmission are viewed, at best, as lacking good sense or, at worst, as being reckless renegades” (Mair 2006, 5).

The long-demanded “hard evidence” from biology for transoceanic contact now provides overwhelming proof that ancient voyagers made numerous effective contacts across the oceans with significant consequences for the recipient societies. The old isolationist paradigm for culture history is no longer viable. It is as dead as the theory of the “spontaneous generation” of new life forms after Pasteur’s experiment. A different historical view must be constructed on the basis of the new evidence.

Chapter 2

Nautical Possibilities

Is it rational to think that voyages across the oceans were possible in ancient times? Was the technology of voyaging developed enough to make such travel possible and even plausible?

The history of ancient seafaring is still only sparsely documented, yet what is known already tells us that some mariners were fascinated with what lay beyond the horizon since long before Ulysses of literary fame (Helms 1988). They sailed to see and settle distant places as avidly as more recent explorers.

Robert Bednarik has been a pioneer in studying very ancient nautics. He pointed out (1997) unquestioned evidence that early hominids traveled out of sight of land to settle parts of island Southeast Asia an incredibly long time ago—as much as 850,000 years. Among later peoples maritime capabilities grew as time went on. Australia was populated by voyagers on the order of 50,000 years ago (Gamble 1993, 214). Bednarik and associates demonstrated how that could have happened by constructing a raft on the island of Timor using only crude stone-tools. They then proceeded to drift on the simple craft nearly 200 miles to Australia (Bednarik 2001).

Seafaring innovation continued in the Pacific island world, as the Solomon Islands were settled 27,000 years ago across more than 100 miles of open sea from Papua New Guinea (Gamble 1993). Meggers and associates (1965; Meggers 1987) presented a strong case for voyagers from Japan before 3000 BC bearing pottery of their Jomon culture to coastal Ecuador. Sailors from Japan also reached Vanuatu in the southwest Pacific, over 4,500 miles distant, where they left their distinctive pottery (Dickenson et al. 1999).

Subsequent (trading?) voyages of several thousand miles were carried out in the central and eastern Pacific millennia ago (Science News 1996; Service 1996; Anonymous 2007; Jones and Klar 2005).

Sailing via the North Pacific current is considered by an increasing number of scientists to have been a feasible way that North America was settled in early times. Such sailing may have begun as early as 14,000 years ago. Fladmark (1979; 1983; 1986) has been a strong proponent of this model. Dixon (1993, 119), Dillehay (2000), Nichols (1995), Gruhn (1998), and Erlandson et al. (2007, 161) are others whose evidence supports the proposition.

Some sea-going rafts could be maneuvered like ships; they were used off coastal China from at least 500 BC, but they may have been built in that area far earlier (Edwards 1965, 100; Waisbard 1980; Ling 1956). That is shown in part by the fact that those craft were apparently models for raft-ships used in Ecuador by around 2500 BC; the latter were essentially identical to Chinese vessels (Norton 1987; Edwards 1972; Doran 1978). Eminent Sinologists Needham and Lu (1985, 48-49) considered sailing rafts of Southeast Asia and Ecuador so similar in design that the latter must be “direct descendants” of the former, mediated by “actual trans-Pacific voyages.” Edwards, as well as Nelson, largely agreed (Edwards 1965, 100; 1972; Nelson 1961).

Of American sailing capabilities per se relatively little is known. Large balsa rafts/ships sailed along the coast and out to sea from Peru, even to West Mexico, at the time of the Conquest and likely had done so for as much as three thousand years (Norton 1987). A number of modern replicas have demonstrated the ocean-going capabilities of such vessels (e.g., Heyerdahl 1959; Willis 1955; Edwards 1965). A crew of a dozen under Alsar (1973;

1974) sailed a fleet of three of those replica rafts non-stop across the Pacific from Ecuador over 9200 miles to Australia, rendezvousing at points en route to exchange crew members.

Sea-going rafts that used centerboards for steering, like those in Ecuador, were known long before in India, China and Southeast Asia (Bowen 1953, 103; Edwards 1965, 98-99). Ships bearing up to four masts and carrying hundreds of passengers were also present in India well before the Christian era (Mookerji 1912; Bowen 1953, 184ff.)

In modern times replica and experimental sea craft have demonstrated repeatedly that surprising forms of vessels--large, small and tiny--can cross the ocean (see compilations in Borden 1967; Barton 1962; Anthony 1930; and Chichester 1973) and no doubt could have done so anciently just as well. Such craft as rowboats, midget sailboats, rubber rafts, canoes, and even barrels have been successfully used in such trips! A blind man sailed alone from California to Hawaii (Anonymous 1983). Large boats are not needed for success, nor is lengthy sailing experience essential; Lindemann, who crossed the Atlantic alone three times, asserted, "It takes a damn fool to sink a boat on the high seas" (1957).

Nearly all geographers, anthropologists and archaeologists concerned with the question of transoceanic voyaging seem to have been landlubbers who have found it difficult to escape assuming that the oceans anciently were barriers to movement. Elkin and MacIntosh (1974, 181) called this mode of thinking "American thalassophobia" (illogical aversion to considering the sea a viable route) while Easton (1992, 39) labeled the notion "intellectual mal de mer."

One reason conventional scholars have refused to grant the possibility of ancient voyaging is that some diffusionist claims were carried to outlandish

extremes in the early 20th century. Their arguments at times maintained that Old World explorers showed up in numerous places in the Americas, but they failed to provide convincing evidence. Absent the substantial data now available, the most extreme of those those speculative notions quickly wore out any welcome among serious scholars. However, the naysayers erred in going so far as to rule out essentially all ocean crossings. But according to current data we know for sure that a significant number of ancient parties did cross the seas, in both directions. The next chapter delineates those movements.

Chapter 3

A Chronology of Voyaging on the Basis of Biological Transfers

This section posits “voyaging episodes,” usually of no more than a few centuries duration, during which one or a series of transoceanic voyages were conducted between the areas noted. Species of flora as well as fauna and infectious organisms that were transmitted across the sea and for which transfer dates have been established are documented. The literature cited is sufficient to establish firmly that voyages indeed took place. Sorenson and Johannessen (2009) cite the essential sources and also establish that purely natural forces would not have produced these distributions. As already noted a total of 125 species of flora, fauna and infectious agents have been identified as definitely distributed in areas an ocean apart during the pre-Columbian era; an additional 80 organisms invite further investigation to determine whether they should be added to the list of confirmed species (see Sorenson and Johannessen 2009, Tables 2, 3, 4, 5, and 7).

The data sources referred to in this work are by no means all that confirm the voyaging episodes. Research on the topic carried out so far could not have exhausted all the available evidence or perhaps even most of it. There surely must be more cases awaiting demonstration.

Yet the documentation referred to already may seem to some readers excessively detailed. That is necessary because critics of the book’s primary thesis have usually claimed that diffusionist formulations like this one lacked adequate backing in the technical literature.

Whatever number of organisms that are ultimately shown to have been shared across intervening oceans, that figure cannot be easily converted into how many voyages were made. Being ignorant of actual details, ought we to

assume that only a single species was taken across per voyage? Or were scores of organisms transported on only a handful of trips? Of course we cannot know for sure about such matters. Beyond making minimum estimates we can only conjecture--reasonably.

Biological data itself in many cases provide dates by which time a transported plant was known in its new habitat. Here I have assumed that dates for the first known appearance of an organism in the receiving area are approximately when the biological exchange actually took place. That might not have been strictly true. The dates used are deduced primarily from archaeological finds of plant specimens, dated artistic representations of plants, and mentions of plants in ancient texts or on other linguistic grounds. At least the arrival dates could not be later than those cited.

A particular advantage for dating occurs in the case of the literature of India. That is because Sanskrit, the traditional sacred language of area, ceased being a vernacular tongue (and thus being involved in the naming of plants) well before contact with European countries began in the late 15th century. So when we discover a Sanskrit name of a plant that biologists assure us is of American origin, we must suppose that the plant was known, named and being grown in India before everyday use of Sanskrit had ceased. Linguists suppose (conservatively) that by AD 1000, no new terms for flora or fauna would have been added to the Sanskrit lexicon (inferred from Pollock 2001; Burrows 1955; Brockington 1994). Actually we find scores of distinct Sanskrit names recorded for certain imported American plants; it is obvious that those species could not have been brought to India as late as by early Portuguese visitors, as biologists generally have supposed. And logically those plants with multiple Sanskrit names were being cultivated earlier, and probably more widely, than those bearing but a single name. For convenience the assumption is made here

that if an American plant had a single Sanskrit name in the language, then it must have been known in India no later than AD 1000. By extension (while our judgment is no doubt somewhat arbitrary), if two Sanskrit names are known, then it is reasonable that the plant may have been present by around AD 600, and so on by 400-year intervals (e.g., three names, c. AD 200), back to at least the middle of the second millennium BC. However the lack of multiple Sanskrit names does not rule out an early arrival date, as shown in the case of the American kidney bean, *Phaseolus vulgaris*, for which only one Sanskrit name has been identified, although archaeological specimens of the beans in India are radiocarbon dated at c. 1900 BC (Pokharia and Saraswat 1999, 99; date calibrated).

Here, rather than to discuss every transoceanic exchange indicated by the data at hand, we will take a narrower compass. In the interest of presenting only the most crucial and convincing evidence for effective voyages across the ocean, the argument will be limited to evidence for voyages linking the civilized areas in the Americas to just four Old World geographical areas: India, China, the Mediterranean/Near East, and Polynesia. This limitation does not assume that other areas failed to participate in exchanges by boat but simply confines the argument to those key areas as a way to focus on the strongest cases.

Following are the minimum number of voyaging episodes as I interpret them. The dates indicate the earliest occurrence of the shared biological species that constitute the primary evidence for effectual contacts.

Voyaging episode I. To America from East Asia (probably south China), bearing

Necator americanus.

c. 5300 BC (calib. ca 6400 BC)

<i>Trichuris trichiura</i> .	c. 5300 BC (calib. ca 6400 BC)
<i>Ancylostoma duodenale</i>	c. 5300 BC (calib. ca 6400 BC)

The parasites *N. americanus* (a hookworm) and *T. trichiura* (whipworm) were identified in human coprolites excavated from a stratum at a site in eastern Brazil radiocarbon-dated to “7320±80” before the present (Ferreira et al. 1988) (but when calibrated by comparing the nominal dates with tree-ring data {according to Stuiver and Reimer 2003; on-line edition at <http://calib.org/calib/>} the actual date would have been about 6400 BC). Since the archaeological site is in interior Brazil, we can safely assume that an additional 600 years (minimum) likely elapsed between the arrival on the Pacific coast of infested sailors from East Asia (the likely origin point for hookworm infection) and deposit of the specimens at the archaeological site.

Samples showing *A. duodenale* (a different hookworm) are evidenced only at later dates from mummies and coprolites elsewhere in South America (Reinhard 1992; Verano 1991; 1998, 221; Allison et al. 1973), but it is plausible that this organism arrived initially at the same time as the earlier two. Furthermore Stodder and Martin (1991) reported that at least eight species of intestinal parasites have been found in the American Southwest in pre-Columbian coprolites, although those authors did not document details or dates.

The nature of reproduction of these organisms establishes that people entering North America via Bering Strait could not have been responsible for their introduction. Cold environmental conditions encountered on that route would have killed any such pests en route if they had been carried by overland migrants (Ferreira et al. 1982; Araújo 1988, 149).

Conclusion: One or more voyages crossed the Pacific to America, around 7000 BC.

Voyaging episode II. To China from America probably on a Chinese vessel making a round trip and bearing on its return:

Arachis hypogaea 2800 BC (calib. c. 3350 BC)

The peanut (*A. hypogaea*) is a native of South America, yet two nuts were found in China in an archaeological site dated to the third millennium BC or earlier (Carter 1974, 213-4; Johannessen and Wang 1998, 22-4). Moreover, multiple specimens of the same nut were reported by Chen (1994, 59) from a Han dynasty tomb (200 BC-AD 200). Glover (1977) also found peanuts in an excavation on Timor island, Indonesia, dated to the “early or mid third millennium B.C.” Kirtikar and Basu (1987, I: 754-65) listed eight Sanskrit names for *A. hypogaea*, suggesting a second millennium BC introduction in India (presumably from China). Krapovickas (1969, 527) pointed out striking parallels between names of the peanut in India and in lowland South America.

Conclusion: At least one round trip from China to tropical or subtropical America, c. 3400-3000 BC, with transmission of the peanut onward to India.

Voyaging episode III. To America from India carrying:

Gossypium arboreum (or *herbaceum*) 3300 BC

All American cottons are tetraploids (genetically doubled) plants that contain a diploid gene derived from a south Asian species perhaps *G. arboreum* (Silow 1949, 112-8; Wendel 1989, 4132), combined with genes from a native American diploid cotton. Transfer of the Asian species could only have occurred by a voyage. The combined mixture, *G. herbaceum*, was also grown later on in China, from whence the voyage might have come, although no early Chinese date for the species is attested by archaeology. A

tetraploid descended from that transoceanic introduction was dated by MacNeish et al. (1967, 191) in the Tehuacan Valley of Mexico estimated as “before 5000 B.C.E.” (but estimated early dates for that region have had to be lowered in some cases—see Long et al. 1989) The date 3500 BC is the earliest I consider plausible in terms of nautical capabilities. The earliest tetraploid cotton elsewhere in America is at Huaca Prieta, Peru, dated c. 3100 BC (calibrated; Yen 1963, 112). The date accepted here for the transfer of Asiatic cotton, 3500 BC, could hardly be earlier.

Silow (1949, 112-8) added that domesticated American cottons occurred exclusively along with the same type of spindle “used by the fine spinners of Dacca muslin in India, and the looms also are identical with those used in the Old World.” They consisted of “eleven independent technical inventions,” a complex “most unlikely” to have been invented independently in the New World.

Conclusion: One voyage to America from India, c. 3500 BC.

Voyaging episode IV. To India (or possibly to the Mediterranean/Near East) from America with

<i>Phaseolus vulgaris</i>	2000 BC
<i>Phaseolus lunatus</i>	1900 BC
<i>Macroptilium lathyroides</i>	1900 BC
<i>Canavalia</i> sp. (an unidentified species)	1800 BC

Pokharia and Saraswat (1999, 99) excavated the first three plants (“beans of American origin” --kidney bean, lima bean, and phasey bean respectively) from “proto-historic sites in peninsular India” belonging to the Chalcolithic (with a radiocarbon date of 1885 BC, calibrated) and Neolithic (c. 1900 BC, calibrated) ages. The first species had at least one Sanskrit name.

The first two species also were found at another site, Diamabad, dated between 1885 and 1180 BC (calibrated; Vishnu-Mittre et al. 1986).

Levey (1973, 55; 1966, 16) connected the medieval Arabic name *lubiya*, for *P. vulgaris*, to Akkadian *lubbu* and Sumerian *LU.ÚB*. The Sumerian name suggests that this bean was in Mesopotamia not much later than 2000 BC.

The jackbean or swordbean (*Canavalia* sp.) occurred along with *P. lunatus* from the early pre-ceramic levels at Huaca Prieta, Peru (Towle 1961, 45), so it is logical that it was transferred along with the other beans mentioned here. Kirtikar and Basu (1987, I: 791) give eight Sanskrit names for this plant, apparently placing it early in South Asian plant history.

Conclusion: One voyage across the Pacific to India, c. 2200 BC, thence to the Near East (or just possibly via separate voyages, across the Atlantic to the Near East and also over the Pacific to India).

Voyaging episode V. One voyage to India from America bearing

<i>Mucuna pruriens</i>	1600 BC
<i>Anacardium occidentale</i>	1600 BC
<i>Bixa orellana</i>	1600 BC

The evidence for an early date for this complex is mostly from Sanskrit names. *M. pruriens* (English cowhage) bore 45 Sanskrit names (Kirtikar and Basu 1987, I: 658-9); *B. orellana* (achiote) had nine Sanskrit names, and *Anacardium occidentale* (cashew) 11 names. In addition, cashew nuts are clearly represented on a sculpted panel at Bharhut stupa dated to the second century BC (Gupta 1996, 17; Cunningham 1879).

Conclusion: One voyage across the Pacific to India, c. 1800 BC.

Voyaging episode VI. One voyage to America from China and return, transferring the first two species to Mesoamerica and the last three to East Asia:

<i>Canis aegyptus</i>	1200 BC
<i>Luffa cylindrica</i>	1200 BC
<i>Amaranthus hypochondriacus</i>	800 BC
<i>Amaranthus caudatus</i>	800 BC
<i>Amaranthus cruentus</i>	800 BC

In 2008 Drögmüller et al. published an analysis demonstrating that the dwarf hairless dog (*Canis aegyptus*) used for food and sacrifice in ancient Mesoamerica and Peru had the same DNA as small Chinese dogs; in Mexico these were present among the Olmec by c. 1000 BC (Coe 1968, 59), while in Shang China this creature was slightly earlier (Covarrubias 1957, 93).

The Asian native plant *L. cylindrica* (smooth gourd luffa) was apparently domesticated in India (Zeven and de Wet 1982, 72). At a site dated 1200 BC on the coast of Guatemala pottery was found that was decorated using the unique cut stem end of *L. cylindrica* as a paint dauber (Kosakowsky et al. 2000, 199); that means that this species was transferred to Guatemala from Asia by that date.

The three species of grain amaranths, although of American origin, were cultivated extensively across Asia, leading J. Sauer (1950) to conclude that “The crop [all three species] is scattered so widely through Asia and is so firmly entrenched among remote peoples that it gives a powerful impression of great antiquity in the area.” He added, “post-Columbian introduction to Asia is hard to imagine.” Furthermore, “the available Old World specimens represent nothing but a small sample of the diversity present in the American

grain amaranths.” Saraswat et al. (1994, 282, 284, 331) excavated a specimen of *A. caudatus* at a site in India radiocarbon-dated before 900 BC (calibrated), and the species bore at least one Sanskrit name (Chopra et al. 1956, 17); it is assumed to have reached South Asia from China. *A. cruentus* is credited to both China and India by eighth-century AD texts. *A. hypochondriacus* was also widely cultivated, ranging from Manchuria to India and Iran (J. Sauer 1950, 561ff.) I assume that all three amaranth species were carried together to Asia (probably to China) by sea at the same time, from where they spread overland to other areas of Asia.

Conclusion: One voyage from China to America and return, c. 1200 BC (or possibly two separate voyages, one ca. 1200 BC and the other around 800 BC).

Voyaging episode VII. One or more voyages to India from America carrying four species and returning with three (or a reverse pair of voyages):

<i>Argemone mexicana</i>		1200 BC
<i>Ceiba pentandra</i>		1200 BC
<i>Nicotiana tabacum</i>		1100 BC
<i>Erythroxylon novagranatense</i>		1100 BC
<i>Cannabis sativa</i>	(from India to America)	1100 BC
<i>Stegobium paniceum</i>	“	1100 BC
<i>Alphitobius diaperinus</i>	“	1100 BC

Saraswat et al. (1994) reported archaeological finds of *A. mexicana* seeds from India at a site dating to the interval 1300-800 BC (uncalibrated), while Saraswat found similar seeds at dates 1100 and 1060 BC (calibrated to c. 1350 and 1285 BC). A very early date is confirmed by the existence of 20 Sanskrit names. *C. pentandra* bore eight Sanskrit names, which is taken to

indicate its arrival in India by c. 1200 BC. Ashraf (1985) has shown that *N. tabacum* was an ingredient in medicines in the two major medical traditions in India and was mentioned in a Sanskrit medical classic. In addition five Sanskrit names for tobacco (one of which is identical in Persian) point to an age on the order of 1000 BC. However, tobacco may have reached India a little earlier by way of the Mediterranean (Egypt)/Near East.

A number of Egyptian mummies, historically dated between 1070 BC and AD 395, contained metabolized products of nicotine (and also of cocaine and hashish) in various body parts (Balabanova et al. 1992, 358; Parsche and Nerlich 1995; Jett 2002a). The analyses were sophisticated and sufficiently determinative to withstand criticisms launched against them (Parsche 1993). *E. novagranatense* (coca), from the Andes, was present in the Egyptian mummies. *C. sativa* (hashish), a central and south Asian native, was present in South American mummies as early as c. AD 100 (Parsche et al. 1993). It seems probable that that plant exchange took place at about the same time as tobacco and coca, i.e., c. 1300 BC. *S. paniceum* and *A. diaperinus*, insect pests infesting mummies in both Egypt and South America, probably made the crossing at the same time and could have come via India.

Conclusion: One voyage from America to India, c. 1300 BC, then movement of species to the Near East; or by separate voyages to India (c. 1300 BC) and to the Mediterranean/Near East (c. 1300 BC), one of which ships made the return trip bearing hashish as well as *S. paniceum* and *A. diaperinus*.

Voyaging episode VIII. One or more voyages to and return from India with the first five species and a return voyage bearing tuberculosis:

<i>Plumeria rubra</i>	1000 BC
<i>Cucurbita pepo</i>	800 BC

<i>Cucurbita ficifolia</i>	800 BC
<i>Amaranthus caudatus</i>	800 BC
<i>Amaranthus spinosus</i>	800 BC
<i>Mycobacterium tuberculosis</i>	900 BC

A. caudatus was excavated in India from a stratum dated between 1000 and 800 BC (Saraswat et al. 1994, 282, 284, 331). It may have arrived with other species of organisms listed here via a voyage from America to India, c. 1000 BC, or it may have come overland from China, arriving there as a result of episode VI. Meanwhile *A. spinosus*, an American weed, has five Sanskrit names, suggesting arrival in India (but unknown in China?) on the order of 1000-800 BC. *P. rubra* (the frangipani) is widely planted in India in the vicinity of temples, and the flowers are used ritually (Parotta 2001; Lancaster 1965, 14). Its six Sanskrit names also suggest substantial age.

C. pepo (pumpkin) is mentioned in texts in China as early as the fifth century AD (Bretschneider 1882, 77-9) and was referred to in India in the Atharvaveda dating before 800 BC (Aiyer 1956, 57); there were at least two Sanskrit names. It was also mentioned in the literature of historical Greece, Arabia, Egypt, Iraq and Persia (Johannessen and Parker 1989, 16-7) and was reported in southeastern Europe by the fifth century AD (C. Sauer in Newcomb 1963, 33).

The American species *C. ficifolia* grows in Asia “over an extraordinary area of varying environmental conditions and its forms vary greatly” (C. Sauer in Newcomb 1963, 31). Plausibly its widespread adaptation resulted from transfer to India many centuries ago.

Mycobacterium tuberculosis was one of the biological transfers from Eurasia to the New World. The earliest documented case of tuberculosis disease in America is in Peruvian/Chilean mummies, dating as early as c. 900

BC (Allison et al. 1981, radiocarbon date calibrated). That movement across the ocean could have taken place as part of episode VIII.

Conclusion: At least one voyage from America to India, c. 1000 BC, with subsequent transfer of several of these species to China.

Voyaging episode IX. From America to the Mediterranean/Near East

<i>Ananas comosus</i>	800 BC
<i>Cyperus esculentus</i>	700 BC
<i>Portulaca oleracea</i>	600 BC

The American pineapple, *A. comosus*, appears on an Assyrian sculpture dated to the ninth century BC (Layard 1849; Jett 2002c), in glazed pottery models of the fruit in Egyptian tombs (Wilkinson 1879, II: 213), on a carved monument, probably of Iron Age date, in a museum at Haifa, Israel (Z. Halpern, personal communication), and in a mural at Pompeii (Casella 2002a; 2002b; 2002c). Gupta (1996, 18) places a pineapple carving at an Indian temple in the fifth century AD, and two Sanskrit names are known.

An American edible sedge, *C. esculentus*, was mentioned in a Babylonian source and had an Arabic name (Thompson 1949, 11). It also bore two Sanskrit names (Pullaiah 2002, I: 203). New World native plant *P. oleracea*, purslane, was mentioned in Egyptian texts “of Pharaonic times” (Burkill 1966, II: 1832-3) but also had six Sanskrit names (Parotta 2001, 598; Chopra et al. 1958, 521; Watt 1888-93, VI, Part 1: 329). (There is a possibility that this species came to Eurasia directly via a voyage between America and India.)

Conclusion: One voyage from America to the Mediterranean/Near East, c. 900 BC, thence overland to India, or possibly by an earlier voyage to India.

Voyaging episode X. Two or more voyages to India from America carrying:

<i>Datura stramonium</i>	600 BC
<i>Datura metel</i>	600 BC
<i>Annona squamosa</i>	700 BC
<i>Annona reticulata</i>	700 BC
<i>Annona cherimolia</i>	700 BC

The daturas (a genus of plants consumed for narcotic, hallucinogenic and medicinal purposes), which are of American origin (Luna Cavazos et al. 2000; Symon and Haegi 1991), were widespread in historical South, Southwest and East Asia. Despite considerable confusion in classification, it is clear enough that at least *D. stramonium* and *D. metel* were present in India (see Sorenson and Johannessen 2009, 189-197 for details). The former had seven Sanskrit names and *D. metel* at least four (Nadkarni 1914, 140-5; Chopra et al. 1956, 91, 123; Chopra et al. 1958, 134; Watson 1868, 257; Pullaiah 2002, I: 207), arguing for the genus' arrival in India at a date of this order.

One of the annona fruits, *Annona reticulata*, is known by four Sanskrit names (Roxburgh 1814; Balfour 1871-73, I: 125; Torkelson 1999, 1646; Int. Lib. Assoc. 1996, 559). Moreover the fruit is called *ata* in Malabar, *ahata* or *ate* in Mexico, and *ate* or *atte* in the Philippines (Pokharia and Saraswat 1999, 97). It is clearly represented on a sculpted panel at the Bharhut Stupa, dated to the second century BC (Cunningham 1879; Pokharia and Saraswat 1999, 97). Bhishagratna (1907, 72) found the species mentioned in a text assigned to the sixth century BC. (The relevant literature on the *Annonaceae* is large; again see Sorenson and Johannessen 2009, 123-131.) Both the fruit of *A. reticulata* and of *A. squamosa* are called in modern Malabar "the fruit of Lord Rama" (Nicolson et al. 1988, 50), suggesting considerable time-depth of the plant in

sacred tradition. Seeds of *A. squamosa* have been excavated from a cave site on the island of Timor that may date as early as the third millennium BC (Glover 1977, 43) and at another site in India radiocarbon-dated to c. 800 BC (Pokharia and Saraswat 1999, 101; calibrated). The *squamosa* bears four Sanskrit names (Parotta 2001, 84-8; Torkelson 1999, 1646-7). Moreover this annona is mentioned in the ancient Ramayana text (Gupta 1996, 19). *A. cherimolia* grows widely in India (Balfour 1871-73, I: 125), and the fruit appears there on a thirteenth century temple sculpture (Johannessen and Wang 1998, 16-7). Probably it was transferred from America at the same time as the other two annona species.

Conclusion: Two (?) voyages to India from America, ca. eighth century BC. (It seems unlikely that such a varied set of species would have been transferred on a single voyage.)

Voyaging episode XI. One voyage from south China, perhaps by way of Indonesia, to America. With:

<i>Morus</i> sp.	600 BC
<i>Gallus gallus</i>	700 BC

Tolstoy (1963; cf. MacNeish et al. 1967, 85) presented a detailed argument demonstrating convincingly that the Southeast Asian technology and tradition of bark-cloth manufacture was transferred by voyagers to Mesoamerica, probably in the early part of the first millennium BC. That seems to have been accompanied by specimens of *M. alba* or *M. rubra*; those two species plus *M. nigra* were present in Mesoamerica before Columbus (Von Hagen 1944, 60, 67; Tozzer 1941, 195) where they were in use to manufacture bark cloth and paper. Use of *M. alba* for similar purposes is oldest in China, according to tradition (Bretschneider 1892, 203, 328-9). It is

assumed here that one or two species of mulberries found growing in Middle America came from south China or perhaps farther south.

Multiple introductions of Asiatic chickens (*Gallus gallus*) are required to account for those present among pre-Columbian Native Americans in Chile (Castello 1924; Latham 1922, 175; Hartman 1975). Non-European black-boned, black-meated chickens were used (only) ritually by native peoples in Latin America (Johannessen et al. 1984) distinctly recalling Chinese usages. A reconstructed proto-language attributed to the bearers of the Olmec art style in Mexico and dating to the second millennium BC contains terms for hen and cock (Wichmann 1995, 76, 276). Actual chicken bones have been excavated at a Classic Maya site (Teeter 2004) dating prior to AD 800.

Conclusion: One or more voyages from China, perhaps via Southeast Asia, c. seventh century BC.

Voyaging episode XII. Round-trip voyage from the Mediterranean to and from Mesoamerica carrying fibers and perhaps starts of:

<i>Agave</i> sp.	300 BC
<i>Helianthus annuus</i>	200 BC

Steffy (1985; 2001) reported the presence of layers of agave fibers used as caulking in the construction of a third-century BC Greek ship that lay submerged at Kyrenia, Cyprus. Identification of the genus (species uncertain, but all agaves are from America) was by both the Royal Botanic Gardens at Kew and a major American laboratory. Evidence for another voyage at roughly the same time comes from Hristov and Genovés (1999) who checked the date of a Roman figurine head discovered by García Payón (1961) in an Aztec site. They established from extant records and workers' recollections that the provenience was unquestionably pre-Columbian. On both stylistic and

thermoluminescence grounds it dated within the Roman era. (There are incomplete reports of other Roman artifacts found in Mexico {Batres 1908; Heine-Geldern 1967; García Payón 1961}.) At least one Greek vessel and one Roman ship must have reached shore on the Gulf of Mexico, demonstrating the capability to make transatlantic voyages in the era of classical civilization.

This voyaging episode is seemingly confirmed by a recent development in maritime archaeology. *The New Scientist* (September 2010, at <http://www.newscientist.com/article/dn19436-2000yearold-pills-found-in-greek-shipwreck.html>) reported that a 130 BC ship wrecked off Tuscany, Italy, was investigated in 1989 and yielded, among other things, a box of pills (medications). These were recently examined by DNA analyses of the complex ingredients. This showed that they included the sunflower, an American species (*Helianthus annuus*), heretofore known to have reached India by the fourth century AD (see below). For this plant to have come into “standardized” medicinal use by Greek physicians by 130 BC suggests that it must have reached the Mediterranean at least a century or more before, probably brought directly from Mesoamerica (where it was known much earlier), in the time range of voyaging episode XII.

Conclusion: At least one voyage (probably a round trip), Mediterranean to Mesoamerica. c. 300 BC.

Voyaging episode XIII. Two or more voyages from America to India, c. the third century BC, carrying:

<i>Carica papaya</i>	200 BC
<i>Lycopersicon esculentum</i>	200 BC
<i>Mirabilis jalapa</i>	200 BC

<i>Psidium guajava</i>	200 BC
<i>Tagetes erecta</i>	200 BC
<i>Tagetes patula</i>	200 BC
<i>Zea mays</i>	200 BC
<i>Helianthus annuus</i>	100 BC

C. papaya (the papaya fruit) had three Sanskrit names as well as Persian and Arabic terms (Pullaiah 2002, I: 125-6; Nadkarni 1914, 87). *L. esculentum* (the tomato) with four Sanskrit names (Parotta 2001, 673; Pullaiah 2002, II: 339) also arrived in India in BC times; moreover, according to a 1985 Chinese press report seeds of this species discovered in a Chinese tomb of the Han dynasty, germinated and bore tomato fruits (Associated Press Archive. <http://www.apnewsarchive.com/1985/2-000-Year-Old-Seeds-Sprout-Into-Tomato-Plants/id-fe9a8c60510ebb4fd86b2537a3658c8e>). *M. jalapa*, the four-o'clock flower, had four Sanskrit names (Torkelson 1999, 1786; Pullaiah 2002, II). The guava, *P. guajava*, carried four names in Sanskrit (Watt 1892, VI, Part I: 351-3; Pullaiah 2002, II: 433; Nadkarni 1914, 320; also in Arabic and Persian), so I infer that it arrived near the same time. Two species of marigolds were also transferred. *Tagetes erecta* with four Sanskrit names and *T. patula* with a single name, could have arrived in India at roughly this time. Three names for *H. annuus* (sunflower) plus a graphic depiction in a second-century BC cave in India (Nadkarni 1914, 177-8; Pullaiah 2002, II: 282; Tewari 1987; Gupta 1996, 86) point to a similar time of arrival, if it had not come earlier via the Mediterranean.

Corn or maize, *Zea mays* (four Sanskrit names) may have been brought to India at this time, nevertheless the history of this important New World

plant is very complicated. Thapa (1966) reported a “primitive” race of maize found in Sikkim, which “bears the closest resemblance to the wild maize of which an actual specimen in fossil was uncovered [in 1960] in the lower levels of San Marcos Cave in Mexico.” That corn would be dated to the third millennium BC or earlier in Mexico. Other corn specimens have been excavated from a cave on the island of Timor, Indonesia, possibly of the “early or mid third millennium” (Glover 1977).

Conclusion: One or more voyages from America, c. third century BC. (It is unlikely that such a wide variety of plants would be carried on a single ship.)

Voyaging episode XIV. Two or more trips to India from America transported:

<i>Canna edulis</i>	AD 200
<i>Capsicum</i> sp.	AD 200
<i>Cucurbita maxima</i>	AD 200
<i>Maranta arundinacea</i>	AD 200
<i>Mimosa pudica</i>	AD 200
<i>Opuntia dillenii</i>	AD 200
<i>Sapindus saponaria</i>	AD 200

Most of the evidence for the date of these seven species is lexical; for each there are at least three Sanskrit names: *C. edulis*, “Indian shot,” Nadkarni 1914, 77; Pullaiah 2002, I: 116; Balfour 1871-73, I: 43. *Capsicum* sp. (chile pepper, probably the species *annuum*), Watt 1988-93, II: 134-9 (also with Arabic and Persian names); Pullaiah 2002, I: 121-3. Hubbard squash, *C. maxima*, Pullaiah 2002, I: 194; Nadkarni 1914, 129; Watson 1868, 319, 327. *M. arundinacea* (arrowroot), Aiyer 1956, 44; Pullaiah 2002, II: 348. *M. pudica* (“sensitive plant”), Torkelson 1999, 1785; Pullaiah 2002, II: 358-9. *O. dillenii*,

the prickly pear cactus, Pullaiah 2002, II: 389; Parotta 2001. And the soapberry, *S. saponaria*, Pullaiah 2002, II: 456-7.

Conclusion: Two or more voyages to India, ca. the first century AD.

Voyaging episode XV. One voyage to Polynesia from South America with:

Ipomoea batatas AD 400

The sweet potato is reported from Easter Island “early (in the) C(hristian) E(ra)” in the form of burnt tubers (Yen 1998, 168, citing Hather and Kirch 1991, 169). Elsewhere Yen {1974} had put the sweet potato in Polynesia “between 400 and 700” AD. The name of this tuber in most Polynesian languages is identical or very close to names for the plant in northwestern South America (Patiño 1976, 62; Rensch 1991, 108; Kelley 1998, 73).

Conclusion: One voyage from America to Polynesia, about 400 AD (although a Polynesian voyage to the continent that picked up the tuber is not out of the question).

Voyaging episode XVI. One voyage to China or India from America (or a roundtrip from/to either) carrying:

Ipomoea batatas AD 300

Cucurbita pepo AD 500

Pharbitis hederacea AD 500

The sweet potato (*I. batatas*) had three Sanskrit names (Aiyer 1956, 71; Pullaiah 2002, II: 307), and according to Yen (personal communication to Johannessen, 1996) it had “the same name in Sanskrit” as in northwestern South America.

A fifth-century Chinese work on agriculture used a term later applied to *C. pepo* among “various pumpkins and gourds still cultivated in China” (Bretschneider 1882, 77-9). The phrasing suggests the species may have been present well before that date. In India the pumpkin also bears two Sanskrit names (Torkelson 1999, 1704). *P. hederacea* (the ivy-leaf morning glory) is referred to in another Chinese document, of the sixth century (Bretschneider 1882, 77-9), and it too had a Sanskrit name.

Any of the three species could have arrived from America to either area before being transferred to the other. References to “pumpkins” also come from the literature of historical Greece, India, and the Middle East (Johannessen and Parker 1989, 16-7), but some scholars question whether those are actually references to *C. pepo*.

Rickettsia prowazekii, the cause of epidemic typhus, was perhaps brought to America on a return trip of a ship bringing some of the plants already mentioned as having reached Asia. The disease was present in America before Columbus (Fonseca 1970, 332-6; Alchon 1991, 22; Ackerknecht 1965, 32-43, 53).

Conclusion: One voyage to China or India (or a roundtrip from/to either), no later than the fourth century AD.

Voyaging episode XVII. At least two (round-trip?) voyages reached India bearing:

<i>Agave americana</i>	AD 600
<i>Agave angustifolia</i>	AD 600
<i>Agave cantala</i>	AD 600
<i>Alternanthera philoxeroides</i>	AD 600
<i>Physalis</i> sp.	AD 600

<i>Cyperus esculentus</i>	AD 600
<i>Erigeron canadensis</i>	AD 600
<i>Gossypium barbadense</i>	AD 600

The three species of agave (cultivated especially in Mexico for its fiber) each had two Sanskrit names, which is taken as indicating an age for transfer to India on the order of AD 600. The same two terms are applied to two of the species (Balfour 1871-73, I: 51-2; Nadkarni 1914, 23; Pullaiah 2002, I: 34-5). All agaves are American in origin. Two of the species have become so naturalized in India as to be considered by some botanists as indigenous, obviously ruling out a purported importation by the Portuguese. How these species of agave may relate to that which reached the Mediterranean in connection with voyaging episode XII is unclear.

For Sanskrit names for *A. philoxeroides* (alligator weed) see Pullaiah (2002, I: 47); in the light of those, the explanation by Sivarajan and Mathew (1994, 49, 51) for the late arrival of this plant in India (that it was introduced in horse feed imported by the British during World War I) is impossible. Identification of the species of *Physalis* seem confused; at least one arrived early as shown by the use of Sanskrit names (Torkelson 1999, 1808; Chopra et al 1956, 192). Dioscorides, the Greek naturalist, made reference in the first century to a (physalis?) “husk tomato” in the Mediterranean area (Gunther 1934, 468-71), but perhaps that term is too vague to be fully credited.

C. esculentus (an edible sedge) with two Sanskrit names (Pullaiah 2002, I: 203) may or may not be connected to voyaging episode VII that reached the Near East; there may have been a second transfer, from America to India alone. American native weed *E. canadensis* or “fleabane” besides bearing Sanskrit names (Torkelson 1999, 1726), is said to have been “naturalized throughout India,” again eliminating any possibility of its reputed introduction

by later Europeans (Pandey 2000, 272). *G. barbadense* is a tetraploid cotton that originated in the New World, yet it had two Sanskrit names in India (Torkelson 1999, 1745; Chopra et al. 1956, 127; Kirtikar and Basu 1987, I: 348); it must have reached India from America well back in the pre-Columbian era.

Conclusion: Probably two or more voyages from America to India, ca. the sixth century AD. (The variety of plants in this set probably would not have come on a single voyage, and maybe not even as a result of two.)

Voyaging episode XVIII. One voyage to China (possibly a returning Chinese vessel) between AD 600 and 800 having aboard:

<i>Cucurbita moschata</i>	AD 800
<i>Diospyros ebenaster</i>	AD 800
<i>Pachyrhizus tuberosus</i>	AD 1200

A porcelain teapot, a Chinese museum specimen representing a moschata squash comes from a dynasty that dates in China to before AD 900 (Sorenson and Johannessen 2009, 499). Vernacular names in India for *moschata* are very closely paralleled by those used in Mesoamerica (Roys 1931, 258; Watt 1888-93, II: 640). *D. ebenaster* (“black sapote”) in India was considered by Balfour (1871-73, I: 23) “a native of China,” but it is actually Mesoamerican in origin (Brücher 1989, 227-8). The term for it used in China today is unchanged from the Classical Chinese name (Bretschneider 1892, 407). The species is also grown throughout India (Chopra et al. 1958, 505). *P. tuberosus*, the yam bean, is represented visually in a Chinese volume before AD 1200 (Johannessen and Wang 1998, 26-27), although Harvard archaeologist Chang accepted it as one of the “early” crops of China (1970, 177).

Conclusion: One voyage from America to China, c. AD 600-800.

Voyaging episode XIX. One voyage to America from Eurasia carrying:

<i>Artemisia vulgaris</i>	Pre-Col.
<i>Chenopodium ambrosioides</i>	Pre-Col.
<i>Solanum nigrum</i>	Pre-Col.
<i>Gossypium gossypioides</i>	Pre-Col.

Roys, following the botanist Lundell, identified *A. vulgaris* among the Maya (1931, 310; Tozzer 1941, 194). The Eurasian native artemisia or mugwort had many of the same cultural associations in Mexico as in the Mediterranean (Mackenzie 1924, 201-4). It was also present in China and India (Bretschneider 1892, 247; Pullaiah 2002, I: 73) and could have been carried to Mesoamerica from any of those three Old World areas. *C. ambrosioides* (“Mexican tea”), a Eurasian native plant, was common in Mesopotamia, China and India (Thompson 1949, I: 416-36; Watt 1888-93, II: 267; Bretschneider 1892, 261-2). It was manifested archaeologically in Mexico dating around the first century (Martínez M. 1978, 123). *S. nigrum* (black nightshade), a native of Asia, was widely distributed in pre-Columbian Mesoamerica and Peru (Roys 1931, 248; Standley 1920-26, 1296-7; Yacovleff and Herrera 1934-35, 281). On the basis of the wide distribution of these plants in the New World it is plausible that they arrived at least 2,000 years ago from Eurasia.

The cotton species *G. gossypioides* was found only in the state of Oaxaca in Mexico. Wendel and associates (1995, 308) established it as belonging to an African (genetic) clade. Their conjectures on how and when the species might have reached Mexico without human intervention are not credible in light of the fact that no close relative is known anywhere else in the

New World. Importation of this African genetic material could plausibly have taken place via a voyage from, say, Egypt as part of episode XIX.

Conclusion: One or more voyages at an indeterminate date from the Mediterranean/Near East, or India, or China

Voyaging episode XX. A voyage to or from Mesoamerica that brought to Europe:

Meleagris gallopavo AD 900

Bökönyi and Jánossy (1959) report that archaeologists have excavated turkey bones in the 14th-century Hungarian royal castle at Buda as well as at a carefully dated 14th century site in Switzerland. At other sites in Hungary of the 10th-13th centuries signet rings show images of turkeys with the fleshy wattle on the fowls' necks. These authors also reproduce the text of a letter written in 1490 by Hungarian King Matthias, who died that same year (two years before Columbus' first voyage), requesting through an envoy that the Duke of Milan (Italy) furnish him with turkeys and a caretaker for them.

Conclusion: One voyage from America to the Mediterranean, ca. AD 900.

Voyaging episode XXI. Travel from/to America to/from India, carrying:

Amaranthus cruentus AD 800

Ageratum conyzoides AD 1000

Asclepias curassavica AD 1000

Couroupita guianensis AD 1000

Cyperus vegetus AD 1000

Pachyrhizus erosus AD 1000

Pennisetum americanum AD 1000

<i>Salvia coccinea</i>	AD 1000
<i>Monstera deliciosa</i>	AD 1300

A. cruentus, although native to Guatemala, was widely grown in East Asia and was considered likely pre-Columbian there by J. Sauer (1950). Unlike other grain amaranths it is not reported as having either a distinctive Chinese or Sanskrit name, so it might have been a late arrival in Asia. *A. conyzoides* (goat weed) had a Sanskrit name and was involved in Ayurvedic medicine (Pullaiah 2002, I: 35). *A. curassavica*, the milkweed, a native of Mexico, is widely naturalized in India and also had a Sanskrit name (Watt 1888-93, I: 343; Pullaiah 2002, I: 75-6). *C. guianensis* (the cannonball tree), which is held especially sacred to the Indian god Shiva (Lancaster 1965, 4), is represented in sculptures on at least five temples; the blossoms are considered to represent a lingam before an erect cobra and thus are symbols of Shiva (Gupta 1996, 58), however the tree is a native of America (where it has no sacred significance), although long grown in India, according to Gupta. The American native *C. vegetus*, a sedge, has a Sanskrit name, showing its pre-Columbian presence in India.

American *P. erosus* (jicama) was considered by MacNeish (1992, 260) to be a Southeast Asian domesticate, as shown by the degree of its naturalization in India. It had a Sanskrit name (Watt 1892, VI, Part I: 3). *P. americanum* (pearl millet) also was known by a Sanskrit term (Parotta 2001, 84-8). *S. coccinea*, a salvia flower, is still another American native grown in India where it was named in Sanskrit (Watson 1868, 489, 201). *M. deliciosa* is an epiphyte (“ceriman”) from Mexico and Guatemala, however Gupta (1996, 108-9) pictures and describes its presence on sculptures from 11th through 13th century temples in India.

Conclusion: Considering the number of species in this set, at least two voyages to or from India, and quite possibly more, must have been made between AD 700 and 900.

Voyaging episode XXII. Several voyages to Easter Island (Rapanui) bore:

<i>Polygonum acuminatum</i>	AD 400
<i>Schoenoplectus californicus</i>	AD 400
<i>Ananas comosus</i>	Pre-Col.
<i>Canna edulis</i>	Pre-Col.
<i>Capsicum</i> sp.	Pre-Col.
<i>Cucurbita maxima</i>	Pre-Col.
<i>Cucurbita moschata</i>	Pre-Col.
<i>Cyperus vegetus</i>	Pre-Col.
<i>Gnaphelium purpurea</i>	Pre-Col.
<i>Ipomoea batatas</i>	AD 400
<i>Lyceum carolineum</i>	Pre-Col.
<i>Manihot</i> sp.	Pre-Col.
<i>Maranta arundinacea</i>	Pre-Col.
<i>Physalis peruviana</i>	Pre-Col.
<i>Solanum tuberosum</i>	Pre-Col.
<i>Sophora toromiro</i>	Pre-Col.
<i>Zea mays</i>	Pre-Col.

P. acuminatum and *S. californicus* formed a thick floating bog on two crater lakes on Easter Island; both plants were used for medical purposes there as they also were at Lake Titicaca in Bolivia (Heyerdahl 1964, 126; Skottsberg 1920, I: 412). Dumont et al. (1998) analyzed cores from one of those lakes and

determined on the basis of radiocarbon dating that the plants were imported in the fourteenth or fifteenth century.

The pineapple, from South America, *A. comosus*, was found growing “semi-wild” on Easter Island when the flora were first recorded by Europeans (Heyerdahl 1964, 126). *C. edulis* (“Indian shot”) from the mainland was found by early Spanish visitors (Mellén B. 1986, 133). “*Capsicum* sp.” (chile pepper) was listed by Knoche (1925, 169) as one of the aboriginal cultigens on the island, moreover, *Capsicum* sp. was reported growing on Tahiti only eight months after that island group’s first European discovery (Langdon 1988, 334).

S. tuberosum, the potato, was documented by some of the earliest European visitors as being grown on Easter Island (Mellén B. 1986, 133). The same source reports that maize, *Z. mays*, was observed by the first Spanish-speaking visitors.

Conclusion: These 17 native American species brought from the mainland to Easter Island would have resulted from up to half a dozen voyages between perhaps AD 400 and European discovery in the 18th century. Some of the exchanges may have resulted from voyages considered in episode XXIII.

Voyaging episode XXIII. Twenty-four species were shared between the mainland and Polynesian islands to the north of Easter Island including:

<i>Ageratum conyzoides</i>	Pre-Col.
<i>Ananas comosus</i>	Pre-Col.
<i>Aristida subspicata</i>	Pre-Col.
<i>Asclepias curassavica</i>	Pre-Col.
<i>Aster divaricates</i>	Pre-Col.

<i>Capsicum</i> sp.	Pre-Col.
<i>Carica papaya</i>	Pre-Col.
<i>Erigeron albidus</i>	Pre-Col.
<i>Erigeron canadensis</i>	Pre-Col.
<i>Gossypium barbadense</i>	Pre-Col.
<i>Gossypium drynarioides</i>	Pre-Col.
<i>Gossypium tomentosum</i>	Pre-Col.
<i>Heliconia bihai</i>	Pre-Col.
<i>Lagenaria siceraria</i>	Pre-Col.
<i>Mimosa pudica</i>	Pre-Col.
<i>Mucuna pruriens</i>	Pre-Col.
<i>Osteomeles anthyllidifolia</i>	Pre-Col.
<i>Pachyrhizus tuberosus</i>	Pre-Col.
<i>Plumeria rubra</i>	Pre-Col.
<i>Sapindus saponaria</i>	Pre-Col.
<i>Sisyrinchium acre</i>	Pre-Col.
<i>Solanum candidum</i> / <i>S. lasiocarpum</i>	Pre-Col.
<i>Solanum repandum</i> / <i>S. sessiliflorum</i>	Pre-Col.
<i>Solanum tuberosum</i>	Pre-Col.

A. conyzoides (goatweed) was considered by Hillebrand (1888, xciii) to have grown in Hawaii before European discovery. *A. comosus* (pineapple) was discovered in the Marquesas, Tahiti and Hawaii (Langdon 1988, 329; Degener 1930, 88; F. Brown 1931, 137) by the earliest European visitors. *C. edulis* (“achira”) was distributed throughout Polynesia (F. Brown 1931, 169-70). The chile pepper, *Capsicum* sp. (the chile pepper, likely *annuum*), was reported growing in Tahiti shortly after European discovery). *C. papaya*, papaya, grew in the Marquesas Islands prior to that place’s first visit by Europeans (F.

Brown 1935, 190; Heyerdahl 1966, 149-57, 219). Hillebrand also concluded that *E. albidus*, a common weed growing in Hawaii had arrived from America; he believed the same about *E. Canadensis*, another weed. Three species of cottons (Wendel 1989, 4132; Burkill 1966, I: 1120) of American origin are documented for Hawaii or other eastern and central Polynesian island groups in pre-European days (*G. barbadense* {syn, *religiosum*}--Langdon 1982, 179; Hillebrand 1888, 50-1; *G. drynarioides*—Hillebrand 1888, 50-1; and *G. tomentosum*—Hillebrand 1888, 50-1).

Tropical American *H. bihai*, a relative of the banana, was grown and its leaves used for fiber in prehistoric Polynesia (Cook 1904, 490; C. Sauer in Newcomb 1963, 41; Heyerdahl 1964, 127). Rensch (1991, 108) and Kelley (1998, 73) provided lexical evidence for two (Rensch: “at least two”) separate introductions of *I. batatas*, the sweet potato, from Colombia to Hawaii and to southern Polynesia via Easter Island no later than AD 700 (see also Yen 1974). *L. siceraria*, the bottle gourd, was not found in western Polynesia, a fact which effectively destroys the idea that gourds drifted from Asia to America, although distributional data appear to confirm that (American) voyagers carried the plant to eastern Polynesia (Whistler 1990; 1991). Hillebrand (1888, I: 101-2) concluded that *M. pruriens* (cowhage), a mainland plant, grew in Hawaii before Captain Cook’s arrival there. *O. anthyllidifolia*, the “Hawaiian rose,” actually of Andean origin, grew throughout the Pacific islands (Safford 1905, 233; Bailey 1935, II: 2414). The yam bean, *P. tuberosum*, grew in the upper Amazon area and also in at least Tonga and Fiji (Heyerdahl 1964, 120-33). *P. rubra* (“frangipani”) was known on the island of Rotuma near Fiji where its Polynesian-connected name closely resembled that for the same species in a language of west-coastal Mexico (Kelley 1957, 197-201).

S. saponaria (soapberry) originated in tropical America yet grew in Hawaii (Langdon and Tryon 1983, 43) as well as in the Marquesas and Society Islands (F. Brown 1935, 160-1). Heiser (1985, 76-7), Whistler (1991), and Whalen et al. (1981) consider the naranjillo, *S. candidum* (South American mainland), *S. lasiocarpum* (of Southeast Asia), *S. repandum* (Polynesia), and *S. sessiliflorum* (South America) so similar that they may all be the same species. (Index Kewensis issued by the Royal Botanic Gardens at Kew considers them synonymous.) Whalen et al. add that, “the fruits are used in similar ways in South America and on the Pacific islands.” These considerations call for a voyaging explanation. (See further on the complex literature on these plants in Sorenson and Johannessen 2009, 339-43). Of the c. 50 species of *Sisyrinchium* all except one grow in America; Hillebrand (1888, 436-7) found the exception (blue-eyed ‘grass’) on high mountains of Hawaii and Maui above 3500 feet (so it did not arrive by oceanic drift).

Conclusion: Considering the number of origins and destinations involved, possibly up to 10 pre-Columbian voyages from America to Polynesia (some probably roundtrips), or vice versa, between about AD 400 and the time of European discovery would have been required to account for these numerous transfers.

In addition to the flora noted above it is assumed that as many as 20 species of infectious organisms were unintentionally transferred across the oceans as a consequence of the voyaging episodes described.

The shipping events just listed are the most plausible voyages we can discern, but again they are only the minimum number. In addition one could well think of additional voyages which were launched and completed without any attempt to carry crops, those where failure of adequate care of specimens transported resulted in their inability to flourish when planted at a destination,

and those which moved organisms to unwelcoming environments where they failed to survive. In addition, we also expect that modern scientific reporting of ancient plant species and ecologies has been incomplete. Altogether it is reasonable to expect that the number of voyages that made an ocean crossing but failed to transfer organisms greatly exceeded the number that were successful.

With this chronological framework as a basis, we can be absolutely certain that a considerable number of successful voyages were made that spanned both the Atlantic and the Pacific. There can be no question that people accompanying this shipping carried significant cultural features with them. Next we will ascertain what cultural parallels reveal about the history of navigation across the seas to and from America.

Chapter 4

India and America: Cultural Parallels

Some impressive correspondences between cultural characteristics separated by the oceans have long been pointed out in the literature. Only those best documented are listed here. We will note particularly parallels for which dates have been established. Beyond those a wide variety of more general similarities have been suggested as evidence of diffusion by sea, but they are not specific or focused enough to be reprised here.

The accuracy of the evidence cited is not guaranteed beyond the scholarly standing of the authors cited. I, at least, consider the information they present to be credible.

In this chapter only cultural parallels directly involving India are treated. Other data have been suggested that some consider to link Hinduized Southeast Asia with (mostly Meso-)America (e.g., Heine-Geldern and Ekholm 1951); however the Indianization of Southeast Asia had not progressed very far until half way through the first millennium AD (Coedes 1968; Wheatley 1983). That is probably too late to have been the source of most of the cultural similarities linking America with Indian civilization according to the biological exchanges we have already examined.

World view/world ages

Mexican scholar Garibay (1959a) considers the diagram on Plate 72 of the Codex Borgia from south-central Mexico to be a graphic form of the conception of the universe in relation to the gods, days of the calendar, cosmic colors, and members of the body. He makes numerous Hindu comparisons

based on the Upanishads. He also finds parallels for the Mexican world ages in the Vedas.

A sequence of world ages is reported in which the “world” is supposed to have been destroyed by different disasters. These ages and destructions occur in the same order in India and Mesoamerica, the first such age is said in both cases to have been 4800 years long, and each was represented symbolically by the same color (Singhal 1969, 65).

Kelley (1974; 1975) found that an extensive series of ideas about the nature of the universe that had been developed in southern Eurasia was adopted and adapted by peoples of Mesoamerica in the fourth through first centuries BC. A sequence of world ages and catastrophic destructions are among these. “The evidence favors an introduction of these elements from India about the first century B.C.” They include the following detailed matches:

- (1) Identities of deities of the lunar mansions;
- (2) The system of four world ages and associated colors;
- (3) Hindu four-element theory and relationships to the world ages;
- (4) Use of an astronomical and cosmological era base;
- (5) Association of cataclysmic catastrophes with an era base and with planetary revolutions and eclipse calculations;
- (6) Use of a nine-day planetary week;
- (7) Use of zero in calculating an era base (in India by 300 BC?); Singhal (1969, 37) adds that so far as the logical principle is concerned, Indian and Mayan concepts of zero were identical, although the expressions of the principle differed. “The common origin of the Mayan and Indian zeros appears to be undoubted.”

To Stewart (1974) Mesoamerican and Eurasian lists of calendar symbols show a high degree of sequential and other patterned similarity. The Mesoamerican system appears to derive from northwestern India between 400 and 100 BC.

A nine-part Hindu planetary week served as a prototype for the Nine Lords of the Night in the Borgia group of central Mexican codices (Barthel 1975b). The nine underworld gods and thirteen heavens/gods above could be as old as c. 200 BC in highland Guatemala (Borhegyi 1961).

Kirchoff (1964b) reports a “calendric classification of 28 Hindu gods and their associated animals into 12 groups, subdivided into four blocks, within each of which is a sequence of gods and animals representing Creation, Destruction and Renovation.” He found parallel lists of gods and animals (or obvious substitutes) in the same order in Mexico and India. (His material was checked in detail by Dr. Budruss, an Indologist at the University of Tübingen.)

Barthel (1974) also elucidated the planetary series and their patron deities in Codex Borgia 14, spelling out their color and directional associations. He concluded that the Nine Lords of the Night of the Mexican Postclassic are a subsystem of the South Asian 13 Lords series and represent a New World interpretation of the Asian planetary series.

Sacred beings

Barthel (1975a) further established equivalences of deities in Codex Laud 8-3 with the planets. These are personified in Hindu theogony, recorded in Sanskrit, with Shivaistic and opposing Vishnuistic components. The Borgia manuscripts express pictorially a syncretistic system resulting from Asian missionary efforts in Mexico. Barthel’s (1981, 205, 217-8) study of the Codex Borgia reveals that the Mesoamerican Nine Lords of the Night is a reflection

of a nine-part planetary series (*navagrahah*) in India with evidence for a fragmented seven-day week. A structural agreement for the nine-part intercalary week points to the northern border of Orissa province, across from Bihar. “In the future, the Indo-Mexicanist student will have to focus his attention beyond southeast Asia to the northern reaches of the Gulf of Bengal.” Moreover, “the series of the nine Lords of the Night in India includes two females” (at least considered female for astrological purposes). Mexican equivalents Tlazolteotl and Chalchiuhtlicue were the only two female members of the [nine Mexican] Lords of the Night.” What he considers [Asiatic/Mesoamerican] Focus B, around AD 1000, does not show any kind of participation by Asiatic artists. “Instead, the transmittal depended on Hindu priests who selected from textual Sanskrit sources information which was transcribed in the style and method of native Mesoamerican pictorials for the use of Nahua acolytes and priests.

According to Giesing (1984) a direct relationship existed between Rudra-Siva (a Hindu syncretic figure traceable in part to the Indus Valley and early Vedic cultures up to 200 BC) and the Nahua deity Tezcatlipoca. Referring to the Borgia codices she connects complexes of attributes of multifaceted Tezcatlipoca with specific Sivaistic sources. With Barthel she holds that there was a partial Hinduization of Mexican culture that took place around AD 700-1300, resulting in a new creed that expanded across ethnic boundaries in Mesoamerica on the Mixteca-Puebla horizon. She lists 50 pages of names and epithets of Siva with specific Tezcatlipocan equivalents. (Golzio {1985}, a German orientalist, reviewed Giesing’s book and praised the author’s “painstaking” research, adding that the postulated parallels do exist, whatever they may mean.)

Cronk (1973) asserted that only in India/Persia and again in Mexico do we find the fire god personified, as Agni (India) and Xiuhtecuhtli (Mexico). Specific parallels are: (1) in physical attributes; (2) in associations of the deities with particular directions or cardinal points and with the year, certain planets, and the stars; (3) in the ceremonial importance of fire and the fire god in religious and secular realms; and (4) in cosmological associations involved in world creation and destruction mythologies and in sacrifice. She treats ceremonial parallels in detail under the headings of sacrifice, fire altars, fire production, new fire, birth/initiation connections, marriage, cremation, inaugurations, and fire walking. Xiuhtecuhtli first appeared in central Mexican iconography in the third century BC.

The Mexican Codex Troano shows a (Hindu) Chac equivalent who treads on a serpent's head and pours water from a vessel, illustrating the Vedic conception of Indra overcoming the serpent/demon Vritra who caught and kept rain from falling to earth (Smith 1919, 324; 1924, 51ff.; Howey 1926).

According to Barthel (1975a; 1981) a current of religious beliefs with its deepest roots in Bengal reached Mexico where it amalgamated with Teotihuacan religion. This Hindu influence on Nahuatl-speaking priests of Epiclassic and Early Postclassic times in Mesoamerica had the result of the "re-barbarization of Hindu components in the New World."

In a 1982 paper (page 58) Barthel concentrated on the importation of knowledge from India into the Maya setting, especially at Palenque [Early to Late Classic]. He reads the Palenque inscriptions according to a scheme in which "a covert Hindu program is revealed, and Sanskrit terms become consistently apparent behind the Maya glyphs." He identifies Mayan God B I with Brahma and Prajapati. No fewer than 20 arguments (listed) link textual and iconographic statements at Palenque with Hindu prototypes. The Rama

legend serves as the cornerstone of the Palenque program. Into the rapidly blossoming city of Palenque representatives of Hindu Brahmanism injected key new elements (Barthel 1982; Kearsley 2002 strongly supports the Palenque-India relationship on artistic grounds, although of course others doubt it).

Barthel (1979) employs Hindu mythology and epigraphy to interpret the Mayan Codex Vaticanus.

Mackenzie (1924, 58) mentions the figure of Vishnu in a Mexican scene, who despite his Mexican features, is so recognized from the mace (*gada*) and *Cacra* that he holds in his two hands. He also notes the Mayan goddess Ix Tub Tun, who spits out precious stones and who possesses attributes of an Indian *nagini* (image of a female sheltered by or wrapped in the coils of a serpent) of Kubera, the Indian god of treasure. Hindu documents of 200 BC–AD 200 mention the *lokapalas*, guardians of the eight world directions. A similar list in Mesoamerica matches at seven of eight points in terms of the recognizable descriptions of associated figures furnished; at least six correspond exactly in position or sequence as well.

Milewski (1959; 1960; 1966) compares the meanings of more than 214 Aztec proper names denoting deities and high social figures with Sanskrit names used in the last centuries BC and in our era. For example, *Chalchiuh-nene-tzin*, Having the Bosom of Emeralds, with *Ratna-garbha*, Having the Bosom of Pearls. The parallels in meaning are mainly related to religion and social power—names of gods, deified animals, luxury items, religious attitudes, and gender or social rank. Prepositions, numerals, verbs, and compounds also correspond. If the two countries were geographical neighbors, Milewski asserts, we would doubtless say that Aztec names were

modeled on Sanskrit names. Only Sanskrit among Indo-European languages shows such similarities.

Myths and legends

An Aztec myth is compared with a Jataka animal tale, a story telling of the Buddha in one of his earlier reincarnations, from the fifth century AD (however the Jataka motif appears illustrated on earlier bas-reliefs of the second or third century BC). The Aztec account is about the beginning of the fifth world age, when the sun originated. One sacred character leaped into the fire and began to burn, then a second one did the same. They became the sun and the moon, the second becoming the lesser light because a hare, which can still be seen on the moon, was thrown at him, wounding and darkening him. This is compared with the story of Buddha as a hare; he sacrificed himself for Sakka/Indra to eat but magically was not burned up. Sakka placed the sign of the hare on the moon to commemorate rabbit's virtue (Compton 1977). Eleven motifs (listed) are shared by the stories. Compton also found 11 themes shared between the Aztec/Buddhist fire-rabbit-moon archetype and the Asian Earth-Diver cycle (in India), which means that the latter is "clearly and intricately related to the Aztec and Jataka tales." He believes there must have been a relationship "not between a very few isolated myths but between elaborated systems of Asian and Mesoamerican thought."

Mackenzie said that fluid from a tree located in the Aztec paradise (*Chalmecaciuatl*--"tree of milk") was fed to children who died before they could reason. A milk-yielding tree of paradise is referred to in the *Mábhárata* of Vedic India (1926, 168-71; Henning 1911).

In Mexico four scenes are faced in the journey of the soul in the land of the dead: (1) crossing a river, (2) passage between two mountains which clash

together, (3) climbing a mountain set with obsidian knives, and (4) dangers of the wind carrying such knives on its blast. Buddhist analogues are so close and complex as to preclude any explanation other than direct transmission (Tylor 1894).

The American (Aztec) story of *yappan* “closely resembles, in all its essential features, a characteristic Hindu myth found in the *Mabá-bhárata*. With that piece of evidence alone, a good circumstantial case is made for the transference to pre-Columbian America of Hindu modes of thought, Hindu myths and deities, and Hindu religious practices” (Mackenzie 1924, viii).

Art and iconography

Gartlemann (1986) reports possessing an anthropomorphic jug from Ecuador, of the Guangala culture, ca. 500 BC–AD 500, in the form of a Buddha, down to details. He is sitting in the yoga posture, his fat face wears an expression of peace and wisdom, he is wearing a cap or helmet exactly like those in Asia, and even has the *'urna,*’ the round mark in the center of the brow, which is one of the *'laksanas'* or marks of distinction’ worn by enlightened souls in India.

Kelley (1974) cites the following parallels in symbolism:

(1) The Hindu *makara* monster compares to the Aztec *cipactli* (underground earth monster). Mesoamerican forms most closely resemble Indian forms of the first century BC or slightly later;

(2) A crocodile head was incorporated as the base of a tree, in the first century BC in Mesoamerica but much later in India;

(3) Rabbit in the moon motif;

(4) An elephant-headed god in India first appears in the second century BC. Elephantine figures are found in Mayan art in the first millennium AD.

Heine-Geldern shows lotus friezes with human figures intertwined that appear in art at Amaravati, India, between 200 BC and AD 200; a very similar motif is found at the Maya site of Uxmal in the sixth century AD. (1964, 49) “There is no reason why the designs in question could not have been introduced into Mesoamerica directly from India.”

Well over 100 Hindu, Jain, and Buddhist temples in India bear sculpted depictions of maize ears held in the hands of voluptuous females most of whom are making a *mudra* gesture. These temples are particularly numerous in Karnataka state (Johannessen and Wang 1998, 10).

Fuchs (1951, 62) reported that a type of dental decoration consisting of inserting a cylindrical block of metal in the incisor teeth was common to Mexico and India.

Pachisi/patolli

The *patolli* game of central Mexico is a variety of lot-backgammon most nearly approaching Hindu *pachisi*. “The complexity of the various parts of *patolli* and *pachisi* from India ... which are analogous to each other” must be due not to separate inventions but to “communication across the Pacific from Eastern Asia” (Tylor 1896).

According to Heine-Geldern and Ekholm (1951), Culin (1903a, 854-5) showed that even the cosmic meanings (relation to four quarters of the world and associated colors) was essentially the same in *patolli* and *pachisi*. In Jalisco, Mexico, a pecked-in-stone *patolli* board design dates the game as at least as old as the Classic (Mountjoy and Smith 1985).

Religious paraphernalia

Conch shells in both India and Mexico have the same senses: of water, life, birth, creation, and war. In India the shells are associated with Vishnu, who represents the creator god par excellence, and also war. They are blown to produce rain. Left-hand turning shells are very rare (Rouget 1948); conchs with left-handed whorls were venerated in Hindu and Buddhist ritual. From West Mexican tombs come a very few left-handed effigy-shell trumpets of fired clay (Furst 1978).

Heine-Geldern (1964) reported that wheeled animal figures were popular in India from the third millennium BC. Similar objects occur at Cholula, Mexico, from the first century BC (Müller 1978, 134, 139), and a similar date applies to wheeled ritual figurines from Guatemala (Borhegyi 1970, 34).

Human effigy figurines from Mexico from beneath a layer of lava [presumably at Cuicuilco] approximately 2,000 years old were shown in 1921 by Z. Nuttall to Indianists; they identified the turbans on the figurines as distinctive of certain regions of India (Smith 1924, 102-3).

Some of the shells depicted on the façade of the Temple of Quetzalcoatl at Teotihuacan can be identified as the West Indian chank, a shell closely related to the “sacred chank” of India (Vokes 1963).

Mudras

According to Martí (1970, 162-3) the following mudras (hand gestures of sacred significance) are identical (physically and semantically) in India and in Mayan art as follows: (1) Patakamudra (signifying tranquility, state of grace); (2) Samadhimudra (= concentration, calm, tranquility); (3) Vajra-Añjalimudra or Añjalimudra (= adoration and with reference to the union of the material and spiritual worlds); (4) Ardha-Chandra (= consecration); (5)

Kartarimuka (= concentration and with reference to psychic/spiritual activity); (6) Hamasaya (= to instruct in wisdom); (7) Chandra-Kala (= sometimes, ascension or elevation to superior spheres); (8) Varamudra or Varadamudra (= to dispense favors, an offering to Buddha in favor of humanity); (9) Abhyamudra or Abhjayamudadamudra (= protection and liberation from fear or dread); (10) Bhumisparsamudra (= sometimes, the call to the World as Witness); (11) Anzain-In (= support upon the earth or the mountain). The Samadhimudra is found on many Classic Maya stelae. The Vajra-Añjalimudra and Anzain-In characterizes many deities in the Dresden Codex and in India on representations of Buddha and Bodhisatvas. These mudras do not appear in Mesoamerica until the Classic period but persist as late as representations of some Aztec deities that show Coatlicue, the deity of earth and creation.

Ritual

Mexican ascetics, like those in India, dressed in white robes and engaged in penitential exercises (they sacrificed or did penance, sang hymns, burned incense, drew their own blood, let their hair grow long and never combed or cleaned it). They also begged for alms with bowls in hands (Mackenzie 1924).

Piercing the tongue and pulling thin objects through it (to induce bleeding, as an offering) was shared in Mexico and India, and the same was true for tearing out the heart of a sacrificial victim while still living (Kirchoff 1964a).

Indian and Mayan stilt rituals are similar (MacLeod 1934, 21).

People in both Central America and Dravidian India practice a hook swinging rite (MacLeod 1934, 30).

A rite similar to the Mexican volador is illustrated in art in India where participants tied by their feet jump from and wind down around a tall pole (MacLeod 1934, 21; 1931).

Technology

Twill double-cloth, used in India but not previously found in America, has now been reported from Oaxaca by King (1979).

In reference to spinning and weaving equipment from Peruvian graves, “the spindles are of the same type as those used by the fine spinners of Dacca muslin in India, and the looms also are identical with those used in the Old World. Wherever cotton occurs in the New World the double-bar loom has been found.” “The double-bar loom is an intricate piece of mechanism involving at least eleven independent technical inventions. It seems most unlikely that such an assemblage of developments, identical with that which had occurred in the Old World, should have appeared in the New World by independent invention” (Silow 1949, 117-8).

Language

Mendoza (1877a; 1877b) offered a comparative lexicon of Nahuatl and Sanskrit. Denison (1913; 1909) claimed that “the vocabulary of Nahuatl is practically Sanskrit.” In more modern times Swadesh (1960) recommended that the relation between Nahua and Sanskrit deserves attention by linguists.

In a review of a volume by Moran and Kelley linguistic anthropologist Durbin (1971) supported Kelley’s treatment of India–Mesoamerica calendar links and suggested a set of possible lexical ties between Prakrit tongues of India (late centuries BC and early centuries AD) and Proto-Maya.

The totality of these data make a persuasive—I think even a decisive--case, that cultural exchanges between Mesoamerica (or America more broadly) and India took place over a long time.

The calendrical and astronomical data at several points suggest that a major period for these exchanges falls within the last few centuries BC or soon thereafter. That period coincides with voyaging episodes XIII and XIV. But there are parallel data enough from the cultural side to support both earlier and later possibilities also.

It is clear that both classes of evidence, natural and cultural, support the proposition that multiple trips across the Pacific connected India with American civilizations. It is not necessary to connect specific cultural transfers with particular voyaging episodes to assure us that voyages were the basis for the parallels.

Chapter 5

China and America: Cultural Parallels

In the same way we compared aspects of the civilization of India with that of ancient America, this chapter adds Chinese cultural parallels to complement the biological ones of Chapter 3.

The sources cited in this section are from authors most of whom are mainstream scholars. Were the standard set lower, a wider array of parallels could have been compiled. As it is, sources that refer merely to “East Asia” or equally vague geographical terms have been omitted. These are specifically China parallels.

Astronomy and calendar

The “Maya concept of eclipse ‘danger periods’ has a notable parallel in the Chinese approach to this topic” (Gingerich 1980). Needham noted the unusual coincidence that the Maya astronomers and those of the Han Chinese worked with an eclipse calendar of 11,960 days (Coe 1975, 31).

Coe pointed out the practice of Chinese (but not European) astronomers of denoting constellations by sets of small circles connected by straight lines, the same as in Mesoamerica.

Two star-groups depicted on the Aztec calendar stone are strikingly similar to the milk dipper in Sagittarius, which is equivalent to the Chinese asterism of Nan-tou, the rice ladle. The second group matches the three stars that form the head of Aquila, which is equivalent to the Chinese asterism of Hoku, the herdsboy (McIvor 2000).

Mirrors

Ekholm (1973) thought that the idea of using mirrors to start fire by focusing the sun's rays derived from China, where at about 500 BC concave, bronze mirrors were being used to kindle ceremonial and sacrificial fires. A tradition in Peru reported that concave mirrors of metal were used to make ceremonial fires. Also, polished obsidian mirrors were used among the Aztecs to look at distant or unseen places and into the future, and this function has a nearly exact parallel in Asia. The use of optical mirrors to produce ceremonial fires seems beyond doubt in Mesoamerica. Chinese use of mirrors to ignite sacred fires for magical and medicinal purposes was documented by Laufer (Carlson 1981a, 126, 132). Both at Palenque and in China mirrors were put in high-status burials. Mexican pyrite mirrors had holders for attachment and are highly reminiscent of bronze mirrors used in Han China, which were worn similarly over the chest as a symbol of rank (Covarrubias 1957, 187).

A (Peruvian) Chavín gold crown is known on which a deity wears a breastplate suggestive of the Chinese *t'ao-t'ieh* design (Campbell 1989, 376).

World view, including geomancy

Heyden (1981) concurs with Carlson (1977) that an orienting system was employed in Mexico that was very similar to Chinese geomancy. Coe (1981a) concurred: "I am really convinced that this idea [geomancy] or group of ideas is highly likely to have come across the Pacific. I would be amazed if Chinese geomancy hadn't gotten into the New World, along with the very complex ideas related to the so-called parallel color-directional symbolism and all the things that go with this," perhaps around the time of Christ.

According to Carlson (1981b, 145, 152, 154) "The cosmological systems of ancient China and Pre-Columbian Mesoamerica have many striking similarities or parallels" including the dragon supposed to be beneath

the earth. “The earth conceptions of China and Mesoamerica each have a prime direction and a sense of handedness and circulation.”

In Chinese cosmography the heavens were round but the earth square. To the Maya the earth was cube shaped (Needham et al. 1971, 4: 73).

Ritual

Marschall (1972, 111-26) relates the following ritual features of South China culture to West Mexico: (1) clay house models; (2) clay figurines of the inhabitants of those houses occupied with daily activities; (3) straight roof lines shown with rising ends; (4) models show houses with one or several stories with an outside stairway; (5) figurines of dogs and birds are in the model houses; (6) rhomboid designs are on walls and ceilings; (7) representations of persons sitting on the shoulders of others; (8) representation of acrobatic games; (9) supposed shamanistic actions; (10) use of the house models as offerings in tombs; and (11) gongs. He considers this a cult-of-the-dead complex from China.

Johannessen et al. 1984. Black-boned, black meated chickens were ancient in South China and Southeast Asia. The same chicken was found ethnologically in highland Guatemala and among the Huastec Maya as well as the Chipaya of Bolivia where these fowls are used (only) in ritual.

Technology

According to Needham and Lu (1985, 4) a major period of intentional Chinese voyaging into the Pacific extended from the third century BC to the second century AD. South Chinese/Vietnamese sailing rafts with center-boards (cf. Ecuador) were quite capable of making landfall on the American continent.

The Aztec *teponaztli* drums or wooden gongs and the *mu yü* of Chinese temples are very similar (Needham and Lu 1985, 27-8).

The balanced shoulder-pole or coolie-yoke appears in East Asia, (the west coast of) Mesoamerica, and Andean South America (Needham and Lu 1985, 40).

The suspension bridge is Andean (also Mayan) and west Chinese (Needham and Lu 1985, 45).

Star-shaped lids were cut from calabashes or bottle-gourds in both China and South America (Needham and Lu 1985, 50).

Mesoamerican peoples folded their codices concertina-style just as the Chinese long before (Needham and Lu 1985, 52).

Use of night soil as fertilizer unites Mexico with China, not with European practice (Needham and Lu 1985, 57).

The making of bronze and the lost wax method of casting were known to both areas (Needham et al. 1971, 4: 544).

The making and use of paper (Needham et al. 1971, 4: 544ff.) and paper books were common to both areas.

The Chinese cloisonné or al fresco technique compares with the use of heavy pigments inlaid into one another, probably with lacquers, as at Tlatilco, Kaminaljuyu and Teotihuacan (Covarrubias 1957, 21).

Ritual and iconography

Needham and Lu (1985, 24) report an unpublished study by G. J. Tee that shows that an early Chavín (Peru) carving of a jaguar and earlier or contemporary Chou (China) bronze castings of tigers share the following: (1) similar posture, (2) bared teeth, (3) ears pointing forward, (4) elongation of the

foot-pads, (5) semi-regular patterns on the bodies, (6) rings around the tails, and (7) hollow backs. These are fantastic conceptual, not naturalistic, felines.

The Nine Lords of the Night in Mesoamerica that were associated with nine layers of the heavens strongly resonate with the Chinese conception of nine levels or spheres referred to in documents of the fourth century BC (Needham and Lu 1985, 29).

Similarity exists between the divinatory aspects of the Mexican ball-game and the use of a board game by the Chinese in which representations of heavenly bodies were moved to determine the balance of Yin and Yang forces in the universe. The Mexican rabbit was associated with the moon and the gods of pulque and of drug plants; in the Chinese idea of the palace of the Lady of the Moon the rabbit perpetually pounded the drugs of the elixir of immortality (Needham and Lu 1985, 30).

Ideas associated with alchemy in China (amulets painted red with cinnabar and use of metallic mercury in tombs) appear in Mesoamerica (Needham and Lu 1985, 30-2).

Divination by scapulimancy in China and Peru (Needham et al. 1971, 4: 540).

“Chewed wine,” in which the fermentation of grain is begun by the ptyalin from saliva, is integral to production of a drink in both East Asia and the Andes. “We doubt whether saccharification by ptyalin . . . [was] invented more than once” (Needham and Lu 1985, 54).

(9) Divinatory games (Chinese “star chess,” the Mexican ball game and *patolli*) (Needham et al. 1971, 4: 544).

Art and folklore motifs

“Palpable similarities” between Mesoamerica and East Asia include: (1) an omnipresent sky-dragon motif; (2) the amphisbaena motif (a reptilian figure with a head at both ends); (3) split-face designs resembling the Chinese *thao-thieh*; (4) tripod pottery reminiscent of Chinese *li* forms; (5) dresses made of feathers; (6) rabbit in the moon; (7) opening and closing of the gap between the rim of the sky and the earth according to myth; (8) twin divinities; (9) the squared spiral motif in art; (6) metallurgy; (7) manufacture and use of paper; and (8) musical instruments (notched flute, nailed drum, sonorous stones, panpipes, and gongs) (Needham et al. 1971, 4: 544ff.)

Six main similarities between East Asian and Maya art were pointed out by Shao (1976; 1983): (1) standing figures hold double-headed serpent bars (amphisbaenas) horizontally or as borders or moldings around the periphery of shrines or niches; (2) figures with three or many heads, sometimes vertically stacked, sometimes with two faces resolved into one by sharing a common eye; (3) multi-headed, multi-limbed deities (*trimurti*); (4) postures and gestures often recalling standard yoga positions; (5) one figure, sometimes in armor, treading beneath his feet a demon or evil spirit (*lokapala* motif); (6) the long nose motif, which some have seen related to the elephant.

Aspects of Central American jade work and uses and those of China “are practically alike” as follows: (1) placing jade in the mouth of a corpse; (2) use of cinnabar paint on a (carved) jade object; (3) round plaques like Chinese “Pi” discs, frequently with an entwining serpent/dragon pattern; (4) presence of yellowish spots in bluish jade carvings, which in China connote earth (blue = water and sky); (5) privileges of jade workers; (6) naming gem jade after birds; etc. (Balser 1968, 61).

Balser (1988) later added that jades excavated at Nicoya, Costa Rica, are similar to Chinese jades. They compare with *kuei* jades, meaning

“scepter,” of Shang China. Two tablets of jade also from Nicoya tombs are similar in shape to the *tao* jade “knives” from China in the Warring States period. Other comparisons are with a jade disc (Han Dynasty), a “dragon tail” artifact, as well as stone representations of the cicada insect.

Ethnographic (but not historical) documentation from China and Mexico reveals the belief that “exhalations” from the mineral helped prospectors locate deposits (Towle 1973).

The art of Classic Veracruz is surprisingly similar to that of pre-Buddhist China, according to Covarrubias (1957, 179, 235), including the disguising and stylizing of the subject matter until it turns into abstract decoration. [Late Classic] Chenes mosaic facades in Yucatan showing the rain god Chac are strongly reminiscent of the masks of the *t'ao -t'ieh* monster in early Chinese art.

Meggers (1975, 11-4) says jade artifacts found in buried offerings at La Venta are similar in form and size to jade *yan kuei* ritual objects from China.

In regard to his collection of thousands of figurines from the Isthmus of Tehuantepec González C. (1977) maintained that representations of Chinese(-looking) people almost all come from the major site of San Lorenzo, due, he believed to a distinct immigration from China arriving there.

“Warrior” figures (left–turned males brandishing weapons, guarding against the underworld) similar to figures from Nayarit are known from Han Chinese tombs (Furst 1965).

History

Excavations near Bahia de Caraquez, Ecuador (Bahia phase, dated to the last two centuries BC--Estrada and Meggers 1961), revealed a set of traits with close parallels in China: (1) house models, (2) the use of neck rests, (3) a

particular type of seated figurine, (4) rectanguloid pottery net weights, (5) “golf tee” ear plugs, and (6) symmetrically graduated panpipes.

On the basis of analysis of 80,000 artifacts from the Tumaco-La Tolita area (southernmost coast of Colombia), Errázuriz (1980) dated an “Oriental” phase (when “Asiatic influence” was manifested) at 400-100 BC. It is similar to the Bahia phase in Ecuador of Estrada and Meggers.

Lou (1956) compared features of the Yueh people of southern China with America. Most of the characteristics of the Mesoamerican serpent are found in the dragon or serpent of the Yueh, etc. They built ships from 100 to 200 feet long during the Han period.

Writing

Shuang (1992; see also Fenyvesi 1996, 46-8), a Shang specialist, read inscriptions on six jade celts from Offering No. 4 at La Venta, Mexico, as matching the names of ancestors and kings of the Shang dynasty.

Xu (1996) identified Chinese writing on Olmec artifacts at several sites. The characters signify sun, rain, water, worship, sacrifice, wealth, etc. He supposed that Shang refugees reached southern Mexico in 1122 BC.

A mainland Chinese scholar visiting the museum at Villahermosa, Tabasco, discovered an Olmec artifact on which were characters he read as Shang Chinese (Xu 2002).

Miscellaneous

Kiang (1933) reported the following selection from a much greater array of parallels between China and the Maya:

(1) Maya numerals are represented 1 by a dot and 5 by a bar, the same as in Chinese Soochow numerals.

(2) In China as among the Maya there was the use of three different calendrical cycles to specify a date.

(3) The Maya idea of the god of the field as “grandfather” is exactly the Chinese idea.

(4) The sinking of sacrificial articles, especially jade, as offerings to a river god.

(5) Giving a child the name of the year or the month in which he/she was born in expectation that this would influence the child’s life.

(6) Killing a chicken/fowl at the initiation of a solemn oath.

(7) The Maya story of the first god, Hunab Kuh, agrees with that of the Chinese first man, P’an Ku.

(8) Healing by blood-letting from the temporal vein or forearm.

Loayza (1948) discussed and illustrated several apparent Chinese objects from Peru. He also reported customs, beliefs and folklore linking the two areas, such as (1) stone guardian figures at entrances, (2) superstitions about eclipses, (3) the maleficent influence of the fox, (4) the festival of virility, and (5) the building of great defensive walls many miles long.

These cultural parallels are often so intricate, specific and extensive that voyages connecting the two areas are obviously required to account for them. They demand that multiple voyages crossed the Pacific to Mesoamerica and Peru from China (or else round trips were made from America) between the second millennium BC and the European discovery of America. This confirms what we observed in Chapter 3 about various voyaging episodes proposed on the basis of biological evidence, although the data do not fully clarify the dates of the events.

Unfortunately evidence other than from biology for contacts resulting from native American voyages to China has not come to light. Undoubtedly a laborious investigation of Chinese written sources would be required before ruling out that possibility. And no one has undertaken that.

Chapter 6

The Mediterranean/Near East and America: Cultural Parallels

The literature necessary to document cultural parallels between these two areas is vast and highly fragmented. As a result this chapter will not be arranged in the same manner as the preceding two. Serious scholarly effort to make these comparisons began with the publication of my paper, “The significance of an apparent relationship between the ancient Near East and Mesoamerica,” in the volume *Man Across the Sea* (1971). In 2009 the matter received further attention with the publication on-line of my monograph, “A Complex of Ritual and Ideology Shared by Mesoamerica and the Ancient Near East” (<http://sino-platonic.org/>). (For simplicity in documentation here, most of the extensive references for the contents of this chapter can be found in the 2009 on-line publication.)

That compilation presented some 385 parallels. Each is laid out with two to eight supportive references to the technical literature. Each parallel is considered to represent a distinct conceptual innovation that I suppose arose at one particular time and place. Many of the features are so arbitrary that it is hard to imagine that they could be duplicated by independent human minds.

Here are a few examples:

- Non-sexual impregnation by a dead sire; a female character in the Popol Vuh (Guatemala) conceives from exposure to the spittle of deceased Hun Hunahpu; in an Egyptian account Isis becomes pregnant from a wooden splinter off the dead body of Osiris.

Compare also in the Popol Vuh an account of the Maya Hero Twins being put to death “in a bonfire” and crushed “on a grindstone, as corn meal is

ground,” then being reborn, just as Ugaritic-Canaanite Mot (“Death”) was burned and ground up before being resurrected (Gordon 1971, 156).

- The Egyptian mythological crocodile and the Mexican under-earth reptilian monster, besides being conceptually closely parallel, were called by phonetically similar names (Sobek/Sipak-tli).

- One leg of a deity was in the form of a serpent.

- Scenes in sacred art depict a miniature seated deity figure that represented ”social order”/rulership being ceremonially presented to a monarch.

- A feline represented the night/underworld aspect of the sun; its spotted skin symbolized the night sky and stars.

- A fertility goddess or earth-mother was conceived of as having “400” breasts.

It seems incredible that such bizarre notions would have arisen independently in (only) two cultures half way around the world from each other.

Some shared traits are more general, and some might be thought to have been conceived separately except for the fact that they are components of elaborate complexes, which in turn cannot be imagined to have been invented twice. A couple of examples will show this complexity.

A Mexica (“Aztec”) legend (Nicholson 1971, 400; Miller and Taube 1993, 70) presents two conceptions of earth’s origin. One has a “great spiny monster” or “horrendous earth monster swimming in the primeval waters.” This creature is known in central Mexico as Cipactli, the earth dragon (it is not clear if this/these being/s was/were a single beast with two aspects or two distinct entities) floating in the waters. As Tlaltecuhltli, earth deity of the Aztecs, he/she (both male and female characteristics are represented) devoured

the blood and hearts of the dead. For the nearby Maya people a “saurian or ophidian monster” was “the exact counterpart of [Aztec] Cipactli” (Thompson 1960, 72-3). Half its body formed the earth’s surface (Helmuth 1987). The monster and the waters in which it existed were considered to symbolize chaos. This creature had been fought, defeated and tamed by a beneficent deity when the earth was being created (Norman 1976). This cosmic creature was associated with a water lily icon (Miller and Taube 1993, 148). In an Aztec tradition the gods Tezcatlipoca and Quetzalcoatl at a certain heroic moment entered the body of the earth monster, split it in half, and left one-half to form the earth while elevating the other half to form the heavens (Nicholson 1971, 400; Graulich 1983, 576).

Upon comparing these beliefs with Near Eastern cosmological myths, amazing parallels become clear. In Babylonian cosmology the waters of the “great deep” were regarded as the primordial element out of which the universe was generated (Sayce 1951; Keel 1978, 40). The “deep” was pictured as a dragon (Tiamat = Hebrew *tehôm*) that was the enemy of light and law. This embodiment of darkness and chaos (Handy 1992b, 5: 1113) was subdued by the Babylonian god Marduk (Day 1992, 4: 295-6). The Hebrew version had it that he/it was tamed and controlled by Yahweh (Isaiah 27:1; Psalms 74:13-14; Wallace 1961). Death for humans was thought to consist of being swallowed by a subterranean aquatic monster with an insatiable appetite (Xella 1995, 2064; Keel 1978, 71-3). A reptilian monster was also associated with the water lily (James 1966). The earth’s surface was thought to be formed of the back of the floating dragon creature (Handy 1992a). The god Marduk slew this monster and raised up half of its body to become the dome (firmament) of the sky while the remainder formed the earth (Pritchard 1969, 67; Glassner 1995, 1820-1).

What an intricate body of interrelated myths this story represents! Obviously the same story is being told with different characters and names, once in the Near East and again in Mesoamerica. Had the parallels been left as a mere list, the relationships would not be as dramatically cohesive as when the pieces are sketched as above. Can anyone honestly suppose that the two bodies of myth had separate origins?

A second suite of shared concepts is equally illustrative of what Berdan (1982, 185) called “remarkable similarities” between Mesoamerican and Old World religions, some of which were noted by the Spanish padres at the time of the Conquest in the 16th century. This set centered on the practice of censuring. In no other areas of the ancient world did the number of references to the use of incense match the frequency in Near Eastern and Mesoamerican texts (Nielsen 1986; Kidder et al. 1946, 260). To the Maya the burning of copal gum was considered so vital ritually that the aroma was known as “the super odor of the center of heaven” or “the brains of heaven” (Tozzer 1941, 142). The aroma of burning resins was supposed to please the gods and make them amenable to granting worshippers’ wishes. To Maya devotees smoke also represented ascending prayers (Bancroft 1882, II: 799; MacCulloch 1951a, 7: 202). The smoke was also thought to have healing and purifying power (Tozzer 1941, 75). Satterthwaite (1946, 21) found that in a Classic Mayan temple incense smoke served to hide a sacred object from sight. Holy or “special” fire was required to burn some incense offerings in the proper manner (Tozzer 1941, 153, 155, 158). The gum was considered the “blood” of the tree from which it was taken (Tozzer 1941, 142), and it could only be gathered upon the completion of prescribed ritual.

Every one of these features of the Mesoamerican incense complex was duplicated in the Near East, as documented by Pedersen (1946, vols. III and

IV), Nielsen (1986; 1997), and others. It is impossible to escape the conclusion that a massive array of ritual and belief was transported to Mesoamerica from the Near East in the former area's Formative period.

The total of 385 parallels referred to are divided (in Sorenson 2009) into sub-complexes, namely: temple/mound/cosmos; sacrifice; incense; offering furniture; figurines; divination; mortuary/death; stelae; purification; symbolism/iconography; kingship; and knowledge systems.

It would be too tedious to re-list all the parallels here. At most it seems advisable to give the flavor of the whole set by displaying a sizable sample of the correspondences comprising just two of the sub-complexes.

Temple/mound/cosmos

A temple was considered to sit on an elevation, whatever its actual height.

Such elevations were considered "artificial mountains."

Each elevation represented the archetypal "first mountain."

This nominal "world mountain" was supposed to sit at the "center point" of the earth.

Earth was viewed as an island surrounded by ocean.

Actual mountain-hilltops were also loci for shrines and rites.

A principal deity was linked with mountains, rain, and clouds.

The "mountain" pyramidal structure had atop it a building that was the temple proper.

A stairway literally or figuratively ascended the "mountain" elevation.

A council of deities was believed periodically to assemble atop a/the sacred mountain to consider the fate of humanity and the world.

Space and time units were related in the sacred site's layout and dimensions.

The "megalithic yard" was one unit of measure of the sacred area.

Sections of temple buildings were partitioned off according to their perceived degree of holiness.

The innermost room was visited by only one, or a few, priest(s).

The temple building entrance was (sometimes) framed by two non-structural pillars (*distylos in antes*)

The temple site was considered the “navel of the earth.”

The temple was surrounded by a bounded, often walled, sacred area.

Small model temples/shrines were sometimes used in the cult.

Devout worshippers made pilgrimages to temples or shrines.

Multiple levels of the cosmos were thought to lie above the earth.

Extensive waters were conceived to exist in the heavens.

Cosmic levels above the earth’s surface were symbolized by pyramid terraces.

Plantings on terraces represented life on the cosmic levels.

Certain colors were associated with the various levels.

Multiple levels of existence were also thought to lie below earth’s surface.

Nine lords of the underworld inhabited the (nine) underworld levels.

A sacred tree served as a way to reach upper and lower levels by climbing or descending while clinging to the roots.

A body of life-giving waters was thought to lie under the earth.

Those waters would flow out from the axis point if not blocked by the temple.

Art shows a sacred figure holding an overflowing vessel.

The overflowing vessel signified fertility and abundance.

A constructed water feature in the temple area represented the underworld sea,

A dragon monster was believed to inhabit the underground waters.

A monster was sometimes shown in art as a reptile with seven heads.

The sun made a night passage through the under- or over-world.

The sun was believed daily eaten and reborn by a sky or earth deity.

The temple sat at the nexus of four world quarters.
 Each world quarter was associated with a particular color.
 Deities (brothers) at the outer edges of the four quarters held up the sky.
 Temples were sited using astronomical/solar criteria.
 Some temples were aligned on a star's rising point.
 South signified the "right hand" (of one facing sunrise).
 West was associated with death and night.
 Four or five world ages each had ended in destruction.
 In one such a strong wind "blew down" the archetypal artificial mountain.
 And so on for 50 more parallels under the heading
 temple/mound/cosmos.

Symbolism/iconography

This sub-complex includes 70 parallels, such as:
 The serpent symbolized knowledge, wisdom, royalty, resurrection, renewal,
 healing and fertility.
 A sacred male figure was shown holding two serpents (or two lightning bolts)
 at his sides.
 The crocodile was associated with the sea and also the sun.
 A feline signified royalty, power, protection, rain, abundance, fertility, the
 earth, the sky or sun, and the night/underworld aspect of the sun.
 Groves of trees were associated with worship and fertility rites.
 A pole represented a sacred tree.
 A sacred tree grew out of a pot.
 The cedar tree was called the "tree of God" in Yucatan; in Babylonia the
 cedar had the name of the god Ea written in its core.
 Trees represented peoples emblematically.

A sacred tree bore blue/green precious stones as fruits, which were fed to mythological infant ancestors as milk in a paradise.

An earth-mother goddess had “400” breasts; 400 signified “a large number.”

The water lily was emblematic of creation/rebirth or of life.

The sun was represented as a winged disc.

Links among sun, moon, Venus, and the wind were expressed by the quincunx design.

An omega-shaped motif represented the hair or wig of a birth deity.

Whistles were used in ritual with a fertility association.

Motifs: a weeping god, and “scorpion men” as guardians.

As in the cases of India and China, it is beyond belief that such a plethora of ideas as these would be found halfway around the world from each other resulting from any process but direct diffusion or migration. From the obvious relationships of these cultural similarities to the biological certainties shown in Chapter 3, we are left with no choice but to reconstruct such an historical narrative as we can that links the continents together by voyages.

We would expect such cultural diffusion to show up in archaeological finds, and it does, although the evidence has often been ignored. Just as a single example, Alcina Franch (1958, a work highly praised by Mexican scholar Garibay--1959b) studied the distribution of 1700 stamp seals recovered by archaeologists in Eurasia and America. With isolated exceptions they occurred in a geographical band extending from the Near East through Italy, Spain, North Africa, the Canary Islands, around the Caribbean, and in Nuclear America. He concluded that this type of artifact must have reached America by sea by around 1500 BC.

A cylinder seal on which were incised characters that appear to be writing (Graham 1971) was discovered at the Olmecoid site of Tlatilco in the Valley of Mexico (Kelley 1966). (See Figure 6.) In 2004 the object was dated by the thermoluminescence method between 1200 and 1 BC (Thermoluminescence Authentication Report, Oxford Authentication Ltd, 25 Feb. 2004). An expert on Near Eastern cylinder seals has interpreted its style as most similar to that of seals from Iran in the third millennium BC.

Other artifacts point in the same direction. Figure 1c shows an odd device from the state of Oaxaca, Mexico, that is no doubt ceremonial in function. Figures 1a and 1b show what must be analogues from the ancient Near East. 1a comes from Nuzi (or Nuzu), an important site in northern Iraq (Starr 1937-39, II: Pl. 113 and endnote 153). It dates to the Hurrian period, around 1350 BC. The related artifact in 1b is Sumerian, also from Iraq, dating to the third millennium BC. Both the Iraq items are considered ritual objects, probably offering stands.

The obviously similar Mexican piece was obtained by the late art-historian/collector Howard Leigh somewhere in the state of Oaxaca. It was part of the inventory of his Museo del Arte Zapoteco located in Mitla (after he died his collection was impounded by the Instituto Nacional de Antropología e Historia de México as part of the nation's cultural patrimony.) No date has been suggested for its manufacture, nor are similar pieces known elsewhere in America, although it has been suggested to fall within the class of ritual furniture called offering stands.

Figure 2a shows a ceramic offering stand also from Nuzu (Starr 1935, Pl. 114F); from the same site Figure 2b pictures a bronze offering stand, topped with three feline figures. Now note Figure 2c that shows a ceramic cylinder from highland Guatemala that is placed chronologically around the

middle of the first millennium BC (Borhegyi 1951b, 170, 171, Fig. 1a). Such artifacts, which are characteristic at several sites in the valley of Guatemala at this time period, in some cases carry feline features on them.

Some of these stands are similar in another way; in both the Near East and Guatemala they bear “horns,” either plain or in the form of men’s heads placed on the rims of the stands. Archaeologists assume that bowls containing incense were placed upon the “horns” apparently so heat from a fire beneath would facilitate release of the fragrance.

Wheeled animal figurines from Nuzi and other Near Eastern sites (conceptually related miniatures for cult use were manufactured throughout much of Eurasia from about 3000 BC until the Middle Ages—Littauer and Crowel 1979; 1992). Figure 3b shows a “toy” dog from Tepe Gawra in northern Iraq, one of the earliest of these pieces. Figure 3a displays a model dog from much later Mesoamerica (the earliest date for wheeled animal figures is the first century BC in highland Guatemala {Borhegyi 1970} and a century later in central Mexico {Müller 1978, 135}). All Mesoamericanists agree that these figures, which may incorporate the only use of the wheel in America, are of ritual significance. Duplicate, independent invention seems a far-fetched explanation for this dual distribution.

Equally noteworthy are miniature wheeled platforms on which an animal effigy rests. Figure 4a shows such an artifact from Susa, the capital of Elam in southwestern Iran, dating about the twelfth or thirteenth century BC (Biblical Archaeology Review 1996, 22{5}: 80). The iconographical significance of the lion figure as well as the royal context of the find suggest cultic significance. From Veracruz, Mexico, similar objects also bear animal effigies, as the monkey in Figure 4b.

In Figure 5 two ritual scenes are juxtaposed. The one in 5b is from Egypt, while that in 5a is from the Codex Borgia, from south-central Mexico (Seler 1898, II: codex page 31). It dates shortly before the Spanish Conquest but surely was based on earlier pictorial documents. While the two scenes differ in style, they share significant motifs, such as streams of water in the Mexican case and *ankh* signs in the Egyptian scene, both of which signified “life” in their respective traditions. The symbols are being poured out by ritual officiants (divinities) positioned on either side of a central figure. The “life” streams cross above his head. The Egyptian rite represented has become known as “the baptism of Pharaoh” (Gardiner 1950).

At the sides of the Borgia panel are Mictlantecuhtli and Mictlancihuatl, lord and lady of the region of death. Egyptian scenes show Horus and either Thoth or Seth; Horus signified the east and Thoth the west, the region of death. Seth is of the north and also was associated with illness and evil. The Mexican divinities are usually associated with the north. Ixtlilton, the center figure in the Borgia picture was a god of healing; Thoth was emblematic of healing in Egyptian medicine. Nepthys, wife of Seth, was sometimes queen of the night and of the dead, like Mictlancihuatl (Sorenson 1971, 233).

When I pointed out these correspondences years ago to William F. Albright, the noted Syro-Palestinian archaeologist, he called the resemblances “most extraordinary” (personal communication, June 23, 1954) and added that if the Mesoamerican scene had come from an area closer at hand, say Mesopotamia, “one would have to assume some [historical] connection” with Egypt.

On the basis of biological transfers discussed in Chapter 3 a voyage was hypothesized between the Mediterranean/Near East and America, in one direction or the other or both, around 900 BC or later. Based strictly on when

the traits in the religious complex discussed above were manifested in the Mediterranean/Near East, the crossing of the Atlantic that bore them to Mesoamerica seems more likely nearer 500 BC. Again around 300 BC the ship excavated at Kyrenia, Cyprus, evidences a visit to Mexico by the presence of agave plant caulking. The discovery and authentication of a Roman figurine head discovered in a Mexican site can only be accounted for by a transatlantic voyage sometime between 200 and 1300 AD (Hristov and Genovés 1999). Voyaging episode XX, possibly as late as AD 1000, seems required to account for transfer of the turkey to Europe and thus adds a later dimension to the history of transatlantic voyaging. Some traits of the ideological complex sketched above could have been carried on those more recent trips. But there could also have been unmentioned voyages before and after.

Nothing has been said about possible voyages from the Near East via the Indian and the Pacific Oceans but that is not impossible. Considering that some data pointing to parallels fell between the Near East and India, like the facts that the *pachisi* game was spread over both zones and that the American pineapple was grown in Assyria, it is possible, although not provable, that some travelers reached America (or vice versa) by a route through the Indian and Pacific Oceans instead of over the Atlantic. Quite clearly they had the nautical capability to do so at certain time periods.

Chapter 7

Polynesia and America: Cultural Parallels

Many students of ancient voyaging have granted over the years that some historical connection existed between these two areas, but hardly anybody has taken seriously the task of identifying carefully and fully the evidence that would allow construction of a credible story of how and when the connection(s) took place. Heyerdahl's reconstruction (1952) of American influences on the island world has generally been questioned by scholars on Oceania and on ancient America equally. But so far no more plausible version of that story has been offered than his; that there is a story to be told is clear enough. It is fair to say that the issue has not received an equitable judgment.

In Chapter 3 we saw that unquestionable biological evidence exists indicating that a number of voyages must be supposed to account for the plant distributions we see. This chapter supplements that information with cultural similarities that, taken together, demonstrate that the biological links were accompanied by consequential transfers of culture.

History or tradition and language

A member of a 1981 expedition to Easter Island (Wheeler 1982) offered three evidences of South American contacts with islanders: (1) the legend about the arrival of a party of strangers (led by one Hotu Matua) from the east; (2) physical anthropologist Gill's excavation and analysis of human remains from tombs on the island "some (of which) were of American Indians"; and, (3) the carved stone wall at Vinapu which is "almost identical with the stone structures at [the Inca sites of] Pisac and Machu Picchu in Peru."

Ethnologist E. S. C. Handy (1930, 131) reported a legend he was told in the Marquesas Islands that described a double canoe of great size that went anciently in search of lands. It was large enough to have “a number of houses” on it. The craft sailed east until reaching a large land they called Jefiti. There they left some of their crew and returned to their island home. If there was history behind this tradition, the landing could not have been anywhere but on the Pacific coast of the mainland.

The languages of Polynesia contain elements found in North and South American Indian languages and that suggest historical connections (Key 1984). Kelley (1964a; 1964b) identified some 50 cognate terms shared by the Uto-Aztecan language family and early Polynesian, the words clustering around ritual and sacred beliefs. Kelley (1957) also believed that the Polynesian myth of Maui had an origin among American Indians. Cultural and especially linguistic comparisons show that some Uto-Aztecan speakers on the west coast of Mexico in the late centuries BC or a little later moved into Oceania bearing it. Kelley (1990) further pointed out similarities between Uto-Aztecan mythology, linguistics and calendrics and those of Polynesia.

Gods and Supernatural Beings

The Hawaiian god Lono was worshiped with a cult that was humane--no human sacrifice and devotion to a god of peace, fertility, and rain (Emerson 1909, 18); the Maori god Rongo (an equivalent name) carried the same associations (Tregear 1904, 462). The original Lono (person/god) departed Hawaii, according to tradition, in an odd type of boat, sailing away to a foreign land but with a promise to return (Beckwith 1940, 31-40). When Captain Cook arrived in Hawaii he was greeted peacefully, apparently being thought to be Lono returning. The god Quetzalcoatl in Mexico, according to

traditional sources, had similar characteristics and also promised to return after departing by sea (Cortez may have been greeted at first as this god--Nuttall 1906).

Hawaiian *pulelehua*, moths or butterflies, represented wandering dead-persons' spirits. Among the Maori, moths were connected with spirits (Beckwith 1940, 190). Thompson (1950, 85-6) said that in Mexico the spirits of women who had died in childbirth, including the Obsidian Butterfly god, were believed to return to earth every 52 days to harm mankind; they were propitiated with corncake offerings in the shape of butterflies. Dead warriors also descended to earth in the guise of white butterflies.

Cosmology

In Yucatan it was believed that a giant tree grew "in the exact center of the earth" and that some spirits of the dead ascended by means of it to the heavens (Thompson 1960, 71). According to Beckwith (1940, 156ff.) a widespread belief in central and eastern Polynesia was that the dead travel to the other world by means of a tree.

The idea that the heavens were divided into "layers" was highly developed in both Mesoamerica and Polynesia (Vaillant 1950, 172; Thompson 1950, 99). The Mesoamericans spoke of 13 cosmological levels above the earth. In Polynesia the number varied considerably--ten, eight, twelve, fourteen or sixteen (Beckwith 1940, 210; Stimson 1933, 80-1; Tregear 1904, 483).

Ritual

Extensive human sacrifice was practiced in Mesoamerica (Crawley 1951, VI: 843; Tozzer 1941) and also in Polynesia (Loeb 1923). The practice

of sacrificing servants to accompany their master in his death and burial was widespread in Polynesia (Linton 1926, 182). This practice was specifically duplicated in burials at Kaminaljuyu, Guatemala, in the second century BC as well as later (Shook and Kidder 1952).

Cannibalism was widely known in Polynesia (Linton 1926, 129-31) and of course in Mexico (Loeb 1923).

The Aztecs performed a rite like baptism shortly after the birth of an infant (MacCulloch 1951b, II: 370). A Mayan baptismal rite differed only in detail (Tozzer 1941, 129). The Inca had a similar rite of immersion and name conferral (MacCulloch 1951, 370). Ellis (1831-32, I: 258-9) reported an immersion ceremony in Tahiti for children of high rank. Some Maori carried out the same rite (Tregear 1904, 46).

Fire-walking was a rite performed by the Maya (Thompson 1960, 100-1; Tozzer 1941, 148) for ritual purification; that ceremony was carried out too in New Zealand and the Society Islands (Baity 1973) for the same purpose.

Adam reported a practice common to shamans in Hawaii and among Araucanians of Chile of identifying a thief by seeing his image in a mirror or a water surface (1931, 50).

Breach of taboo as a cause of illness and confession as a means of healing were common to Polynesia and Peru (Handy 1936, 127) and also in Mexico.

Chewing grain or the kava root in the manufacture of a stimulant drink occurred in both Bolivia and Polynesia. In Polynesia while the kava root was chewed, the mastication was not of practical chemical value; it must have been a relic of a former practical function, a mere formality, for the kava decoction was consumed immediately without waiting for any fermentation as was done with masticated grain in America (Sorenson 1952).

Art and aesthetics

A shared recreation was walking on stilts: for Polynesia see Linton 1926, 133; Heyerdahl 1950, 33; for Middle America see Nordenskiöld (1933, 263).

Sculptures-in-the-round of human figures are common in Mesoamerica and less so in the Andean area. This practice occurs only in eastern Polynesia, chiefly the Marquesas and Easter Island (Burrows 1938, 40).

Mouth flutes and nose flutes were also shared between the two areas (Emory 1942, 131, 132), while the gourd rattle, widely distributed in the Americas, occurs in Polynesia only in Hawaii.

In the civilized areas of the Americas use of parasols was limited to chiefs (Nordenskiöld 1933). Essentially the same custom was Polynesian (MacLeod 1928).

Hawaiians used marionettes with movable joints in entertainment performances (Emerson 1909, 91). Movable-joint ceramic figurines were common among the highland Maya of Guatemala (Borhegyi 1954) (their functions are unknown).

A “birdman” motif on a decorated spindle whorl from Puna Island, Ecuador, has been compared with “birdman” decorations in the Mochica period in Peru and on Easter Island (Northern 1968).

Knowledge Systems

Keeping records by use of knotted string mnemonic devices was shared between Polynesia and Peru (Birket-Smith 1966-67; Rowe 1947, 326).

The thirty-day month of the Incas was divided into ten-day periods (Rowe 1947, 328), while Burrows (1938, 84) found indication that in central and marginal Polynesia the month was once divided into ten-day periods.

The Hawaiian calendar year consisted of 12 30-day months plus five supplementary days at the end (Beckwith 1932, 80) comparable to the five “unlucky” supplementary days at the end of some Mesoamerican calendar years (Thompson 1960).

According to Kepelino knowledge of “lucky” or fortuitous days for certain activities was brought to Hawaii by ancient settlers, including the casting of horoscopes for a person’s life (Beckwith 1932, 81). A choice of occupations for a child was made among the Maori guided by astrology (Tregear 1904, 382). Thompson (1960, 103) and many other sources report on the power of horoscopes in governing the lives of Mesoamerican peoples.

The Inca (Rowe 1946, 303) as well as Hawaiians (Beckwith 1940, 89) divined by counting a pile of objects to see if the count came out odd or even. Moreover, in Tahiti divining was done by observing the position or movements of a victim on the altar, or of the appearance of the heart or liver of animals offered (Ellis 1831-32, I: 303). Observations of the state of the internal organs of a sacrificial victim were so “read” in Peru (Rowe 1947, 303).

Maraes (sacred ceremonial areas) of eastern Polynesia were similar to ceremonial areas in the Maya area: a pyramidal mound faced a narrow court, while on the mound stood three stone uprights; another stone out in the court marked the spot for a priest/communicant to stand (Emory 1933, 50-1, 33-4, 23). Those features were identical in what Ruppert (1940) called Maya “special [architectural] assemblages” (“E-groups”) which had astronomical functions.

Alignments of names of the lunar nights in Polynesia and the day-names of Mesoamerica were shown to be related by Kelley (1960). He (1964) also discussed a number of myths that were essentially the same in Polynesia and Mesoamerica.

Material Culture

Bennett excavated fine-grained circular stone mirrors from the island of Kauai, Hawaii, which resemble certain Mesoamerican biconically perforated mirrors (Probst 1963, 29-30). Heyerdahl (1950, 33) reports that polished stone mirrors occurred in Peru and Tonga.

Ellis (1831-32, III: 102-3, 112) told of the use of litters to carry important people in the Society Islands as well as in New Zealand and Rarotonga (Tregear 1904, 145; Linton 1925, 44). Both Aztec and Maya (Tozzer 1941, 165) and Peruvian cultures (Rowe 1947) also used them for transporting high-status persons.

Sewn plank canoes were made in the Marquesas, Hawaii, Tahiti, Easter Island and elsewhere (Metraux 1940, 204ff.) The same was true of Chile (Lothrop 1932, 249ff.)

Virtually identical bark beaters have been found in Mexico and Polynesia (Von Hagen 1944, 52-3, 48). The process of bark cloth manufacture was “identical.”

Wooden pillows were used in northern South America and Central America, as well as generally throughout Polynesia (Nordenskiöld 1933, 262).

Sliding panel-type doors were in use in Bolivia (Bennett 1947, II: 118) as in the Marquesas and New Zealand (Linton 1926, 77-8.)

A sharply recurved-point fish hook with narrow opening comes from shell middens of northern Chile and generally in Polynesia (Heizer 1949). The same shape was used in Ecuador (Bushnell 1951, Fig. 24, t-v).

A unique implement from Kauai, Hawaii, is a grinding stone for which there is no evolutionary development visible in the archaeological record nor analogies elsewhere in Oceania (there only pounders are used). These grinding stones show “a remarkable similarity” to the metates of Mexico and Central America (Stokes 1932).

Feather cloaks were in use as luxury items in Mexico in the late centuries BC (Vaillant 1950, 146). In Peru they come from the Nazca culture (early centuries AD) (Means 1936, 105). Buck (1938) reports similar garments in Polynesia.

Agricultural terracing in Peru and central Mexico is as old as 800 BC (Donkin 1979, 18) and continued later. In Hawaii and the Marquesas (but not farther west) elaborate terrace systems were in use at the time of European discovery (Linton 1926, 35).

Small cultivated plots were dug below ground level on Easter Island (Skottsberg 1920, I: 13). On the coast of Chile also crops were planted in moist plots dug below ground level (Moseley 1969).

Faced stone construction (like that notably in Peru) in sacred plazas appears in Hawaii, Easter Island, and the Society Islands (Emory 1933, 48). Emory (1963) attributed dressed-stone masonry on Easter Island to an Andean source. Bellwood (1989) agreed that the “occurrence of an Inca style of stone facing on at least one Easter Island temple platform” is evidence for Peruvian contact.

Massive sacred structures were built in the Society Islands “late” (AD 1300?) in their traditional history. These were pyramids of stone up to 50 feet

high and with as many as 11 stages or terraces (Emory 1933). They of course had parallels in Mesoamerica and to a lesser degree in Peru.

Irrigation channels of fine-laid stone were constructed in the Marquesas (Linton 1925, 102). An earth and stone ditch 1.3 miles long had been built on Oahu (McAllister 1933, 28). Stone channel ditches were in use in Peru by AD 1000 (Bennett 1947, II).

Hairless, virtually barkless small dogs were raised for food in Hawaii (McAllister 1933, 23). The same occurred in Mexico (also Peru) (Covarrubias 1957, 93).

Almost a score of patently “Maori” (“mere” and “toki” forms of) stone clubs have been found at various places in western North and South America (Imbelloni 1930; Lehmann-Nitsche 1909-1910; Schobinger 1956). Imbelloni (1934) compared Maori and Chilean chants used when the “toki” stone axe was used to fell a tree (the axe was called by the same name on the mainland and in the islands) and found them essentially the same. Imbelloni also said that several specific wooden club forms were shared in Polynesia and South America. Clubs whose heads were in the shape of stars or rings are found in both Polynesia and Ecuador (Verneau and Rivet 1924).

Peruvians cooked in an oven with hot rocks, as in Polynesia (Rivet 1956).

Ellis (1831-32, 116-19) noted the poncho as a similarity between Polynesia and South America. Contrary to some assertions the poncho was pre-Columbian in the New World (Ihle 1939).

Closely grouped, contiguously walled masonry houses are unknown in Polynesia except at the site of Orongo, Easter Island. Similar house construction occurred in highland Bolivia (Ferdon 1961).

Other South American features that are found on Easter Island (but nowhere else in Polynesia): stone pillows and shallow grinding stones indistinguishable from Amerindian metates (Heyerdahl 1968).

Easter Island spearheads found in an Indian grave in Chile (Aichel 1925) are surely from the island (although Metraux {1940, 416} supposed without a substantive basis that they were carried to the mainland after the European conquest). Zaki (1981), an archaeologist who had worked on Easter Island, said that at three ruin groups obsidian artifacts and waste “show a strong resemblance to South American types.”

Langdon (1988) explained how Easter Island chickens that lay blue eggs closely resemble those from Chile and maintained that they were brought to the island by raft voyagers.

In addition to these specific parallels (and still more could be added), several scholars have offered more general lists of trait similarities (e.g., Sorenson 1952; Heyerdahl 1952; MacLeod 1928a, 13), which offer other possible evidences for diffusion, although some of the items mentioned are rather too general to be relied on unquestionably.

A large number of the cultural features listed are sufficiently arbitrary that it seems highly unlikely that the duplication could have originated strictly by the inventiveness of “the human mind.” There must have been multiple voyaging episodes connecting the mainland with the islands, especially as shown in Chapter 3. Furthermore the shared traits are not mere “cultural embroidery.” Enough important elements of the cultures are represented in the list that we must suppose that, in accordance with Heyerdahl’s view, major influences from the continent were at play on the island populations with foci at three points, Easter Island, the Marquesas, and Hawaii.

Chapter 8

Traditions about Transoceanic Voyages

In histories or traditions documented in some parts of the world voyages of discovery or settlement from across the oceans are reported. These are usually difficult or impossible to establish as absolute fact, yet they are of value in establishing the probability that ancient people made significant voyages across the oceans.

Scholars acknowledge that the Norse (or Vikings) sailed to Iceland and then Greenland. Actual ruins of their settlements have been discovered that agree with traditions in the eddas about colonizing parties dating around 1000 years ago. Conjecture about the location of “Vinland,” an area reportedly farther west than Greenland, has been rampant since the late 19th century. In the early 1960s excavation at a site in northern Newfoundland (most fully reported in Ingstad and Ingstad 1985) revealed a non-Amerindian settlement that was widely (although not universally) accepted as representing Vinland. However, since the stretches of open sea between Scandinavia and North America along that route only occupied a few hundred miles, this tradition and discovery did not provide strong evidence for “transoceanic” voyaging of the sort we are concerned about in this book.

Even less substantial traditions suggest that other medieval explorers might have crossed the Atlantic. A great deal of ink has been spilled about two purported explorers of North America, Brendan and Madoc, from Ireland and Wales, respectively (for example, Little 1946 and Davies 1984). Even more doubtful is speculation based on fragmentary reports of “Fortunate Islands,” “Brasil,” “Antilia,” and other (perhaps) mythical islands in the North

Atlantic (Villiers 1957; Quinn 1989). Nothing substantive has come to light, either from European or American sources giving firm assurance that actual voyages were made to America in connection with these reports. Equally ephemeral are suggestions that Roman or Greek classical sources (e.g., Cronau 1892) referring to mysterious “lands to the west” (including “Atlantis”) were based on actual sea journeys, although external evidence for Roman ocean travel is somewhat more substantial (e.g., Pohl 1973). Reports of medieval voyages from Arab Africa (e.g., Morales Belda 1973) are little better backed by credible evidence.

The Fu-sang tradition and others from China (e.g., Watson 1935; Vining 1885) have also been discussed extensively without a convincing case being made that voyages to America were reported thereby. Menzies’ very popular book (2004) about a Chinese fleet that might have reached the Americas in AD 1421 has convinced few scholars of the reality of such a visit, although there is little question of the capability of Chinese vessels to cross the Pacific then. But even if accepted as historically accurate, a 1421 event is too late to carry much weight in reference to the question of early transoceanic voyaging.

The question of sailing across the North Pacific to the Northwest coast of North America has also drawn a certain amount of attention. Adam (1931), Badner (1966), and Hentze (1951) have made solid arguments toward showing Shang and Chou dynasty influences on the art of the Northwest Coast but traditions related to that influence are almost entirely lacking. Vine DeLoria (1995, chap. 4), noted Amerindian historian and writer, said that some North American tribes have traditions that report that their ancestors crossed the ocean in boats, but he did not specify them.

Historical accounts are sparse in South America that might indicate an overseas connection. In Colombia the inland Tukano people are reported to

believe in their origin across the Pacific (Fulop 1954, 105), as do the Cashibo of interior Peru (Robinson 1969). There is also the legend of one Naymlap, a purported ruler in northern Peru who was said to have arrived there accompanied by a fleet of rafts; Heyerdahl et al. (1995) interpreted that tradition as reporting the arrival of raft people in the Lambayeque area of Peru around AD 1100. Caillot (1914, 145, 173; cf. Christian 1924) reported a tradition on the Polynesian island of Mangareva about the arrival of a novel form of raft that arrived from the east, under the leadership of a red-skinned chief named Tupa. Rivet (1956) considered this to have come from Peru and tied the tradition to the Inca report that ruler Tupac Amaru sent a fleet of rafts into the Pacific on an exploration not long before the arrival of the Spaniards, although the claim that the expedition returned after having found “rich lands” is hard to square with any Polynesian destination. None of these legends is substantial enough to be significant in regard to the general question of whether transoceanic voyages arrived in America.

A body of traditions that does hold promise comes from Mesoamerica. These reports have commonly been ignored by Mesoamericanists or seen by them as mere myths rather than as historical accounts, but their considerable number among Mesoamerican peoples and their relative specificity argue that there are historical facts behind some if not all of them.

Of course it is hard to credit large-scale migrations on the basis of legends that are more likely to be about the movement of small groups (often of elite persons). A good example is the case in West Mexico where a tradition recorded by early Spanish priests told of the arrival of the Tarascan people by boat. Freddolino (1973) compared this account with the archaeological record but found no evidence of the arrival of any immigrant group. She concluded that probably a small group came into the area by sea, and upon gaining

political dominance, their story was extended as though it applied to the entire population. Of course the arrival of such a small party was not clearly reflected in the limited material remains that have been excavated. Robertson and Houston (2003, 729) make the point more generally in speaking of linguistic and archaeological evidence together: “The cause of migration in many cases is very complicated, and transparent links with ceramics or with other artifacts are improbable.” They add that, “cultures don’t emigrate. Frequently it is only a narrowly defined sub-group” that moves. That statement certainly describes situations where small parties typically would arrive via transoceanic voyages.

Peoples in Mexico and Guatemala believed that some of their ancestors originated from across the ocean. In the light of the data already presented, some of the reported voyagers could very well have consisted of limited parties who arrived bearing Old World plants and cultural features.

No doubt some of the traditions sketched below are duplicate reports of the same event(s), nevertheless resumés of all the best-known Mesoamerican traditions are reported on the assumption that the number of distinct sources is meaningful in weighing the historical significance of the evidence.

Central Mexico

- “It is the common and general opinion of all the natives of all this . . . land, which now is called New Spain, besides what seems demonstrated in their pictures [books], that their ancestors came from western parts; . . . as appears in their histories their first king was called Chichimecatl, who was the one who brought them to this new world where they settled” (Alva Ixtlilxochitl 1952, I: 15-6).

- “Those who possessed this new world in this third age were the Ulmecas and Xicalancas; and according to what is found in their histories, they came in ships or barques from the east to the land of Potonchan”

(Alva Ixtlilxóchitl 1952, I: 19).

- “For a long time and by means of our writings, we have possessed a knowledge, transmitted from our ancestors, that neither I nor any of us who inhabit this land are of native origin. We are foreigners, and came here from very remote parts. We possess information that our lineage was led to this land by a lord to whom we all owed allegiance [vassalage]. He afterward left this for his native country Because of what you [Spaniards] say concerning the region whence you came, which is where the sun rises ... , we believe and hold as certain that he [the Spanish king] must be our rightful lord (As told by the Aztec ruler Moctezuma to Cortéz’s party soon after their arrival in Mexico—see Nuttall 1906, 135-6).

- “Concerning the origin of this people the account which the old people give is that they came by sea from toward the north, and it is certain that they came in some vessels of wood, but it is not known how they were built; but it is conjectured by one report which there is among all these natives, that they came out of seven caves and that these seven caves are the seven ships or galleys in which the first settlers of this land came The first people to settle this land came from toward Florida, and they came along the coast and disembarked at the port of Pánuco [in Veracruz]” (Sahagun 1946, II: 13-4; compare II: 300, 306).

- Códice Matritense, folios 191r and v, presents a Nahuatl epic poem as Sahagún recorded it in the mid-1500s: “This is the story the old men used to tell: In a certain time which no one can now describe, which no one can now

remember, those who came here to sow, our grandfathers and grandmothers, landed here, arrived here, following the way, and came at last to govern here in this land, which was known by a single name, as if it were a little world of its own. They came in ships across the sea in many companies, and arrived there on the seashore, on the northern coast, and the place where they left their ships is now called Panutla which means, ‘Where one crosses the water’” (León-Portilla 1971, 455).

- Domingo Francisco de San Anton Munon Chimalpahin Quautlehuanitzin (Rendón 1965, 166, 169) was a noble from the Chalco region of the Valley of Mexico, born in the 16th century, who compiled histories from native documents in his possession. He wrote of an ancient lineage that came from across the ocean “many units of four hundred years ago.”

Highland Guatemala

- “According to sources available to Fuentes y Guzman (he had . . . before him all the books, records, and other papers in the secret archives of the [native] city [of Utatlán]), ‘The nation of the Quichés or Tultecas, extended its empire over the greatest portion of the present kingdom of Guatemala; and, on the authority of the manuscripts mentioned above (which were composed by some of the Caciques [native lords], who first acquired the art of [Spanish] writing), it is related that from Tanuh, who commanded them, and conducted them from the old to the new continent, down to Tecum Uymama, who reigned at the period when the Spaniards arrived, there was a line of 20 monarchs. They first established themselves in the kingdom of Mexico, where they founded the famous city of Tula . . . ” (Juarros 1823, 88-9).

- The Lacandon Indians of southern Mexico have stories parallel to the account in the Quiché documents, that is, they believed their ancestors arrived from across the sea (Bruce 1977).

- “In the Testimonio de los Xpantzay, that group claimed they are descendants of Adam, Abraham, Isaac, and Jacob, and that they helped build the Tower of Babel, another center in the Judeo-Christian myth of partition. Thus, in this seventeenth-century legal document, the Xpantzay contextualize and legitimate themselves” (Braswell 2001, 51-8).

- Concerning the ancestors of the lords of Totonacapan in highland Guatemala, “They came from the other part of the ocean, from there where the sun rises” (Recinos and Goetz 1953, 169) In their annals “we have written that which by tradition our ancestors told us, who came from the other part of the sea, from Civán-tulán, bordering on Babylonia.” (Recinos and Goetz 1953, 194).

- “From the other side of the sea we came to the place called Tulán, where we were begotten” And “From the west we came to Tulán, from across the sea; and it was at Tulán where we arrived, to be engendered and brought forth by our mothers and our fathers” (Recinos and Goetz 1953, 43, 45).

Yucatan

- “Some of the old people of Yucatán say that they have heard from their ancestors that this land was occupied by a race of people, who came from the East and whom God had delivered by opening twelve paths through the sea” (Landa, in the 16th century, in Tozzer 1941, 16).

- “Many Indians of discretion said they had heard from their ancestors that certain people who had come from the east had settled that land. God had

freed them from other peoples by opening a road for them through the sea” (Herrera, in 1601, quoted in Tozzer 1941, 214).

Chiapas

- A native Tzental Maya source, known to Ordoñez y Aguiar as well as Núñez de la Vega, but subsequently gone missing, spoke, according to those 17th-century historians, of the “True origin of the Indians: their departure from Chaldea: their immigration to these southern parts: their crossing the ocean,” etc. (Sorenson 1955, 432; Nuñez de la Vega 1702; Ordoñez y Aguiar 1907).

Obviously some of these statements include historical and geographical interpretations by the colonial Indians that would not have been so phrased in their original records (e.g., names like “Babylonia,” “Abraham,” and “Chaldea”). Still there can be little question that the native interpreters believed that their traditions referred to voyages across the ocean. Their use of Biblical expressions to convey their rudimentary knowledge of world geography that the Spaniards had imparted to them is natural enough. Scholars ought not to refuse out of hand to accept their use of such names but should interpret their intentions in utilizing such nomenclature. They clearly believed that their ancestors (at least some of the ruling class) had arrived from overseas.

On balance it may fairly be said that traditions were widespread in Mesoamerica to the effect that ancestors of a number of that region’s peoples originated from across the ocean.

Chapter 9

Ethnic Variety in America

Supposing that seaborne visitors from the Old World actually came ashore in America, what happened to them? In some cases they apparently succeeded in communicating cultural information from the Old World to local groups who later absorbed them. In other cases they could have maintained themselves as distinct populations. Is there physical or linguistic evidence for the existence of such enclaves on the ancient New World scene?

An obvious place to search for incoming foreigners is languages. At one time the most widely accepted model for the linguistic (and anthropological) settlement of the Americas was that put forward by Greenberg, Christy and Zegura (1986), which posited three separate early populations entering the Western Hemisphere by way of the Bering Strait. But critics were numerous, and not many years later the theory was said to have “slowly unravelled” (Crawford 1998, 24).

On logical grounds alone Swadesh (1960, 896) supposed that “New languages probably came into America in the late millennia just before Columbus, but their speakers must have been absorbed” After studying more than 300 language families throughout the world (each completely unintelligible to one another), Nichols (1995) identified 143 families in the New World, a surprisingly high proportion. Based on rates she worked out for the development of new families, a supposed single original family that came across the Bering Strait would have had to arrive something like 60,000 years ago to account for the large number of surviving families, but such a date is archaeologically unacceptable. One optional explanation Nichols offered said

there must have been about 10 separate infusions of new language groupings into the New World in order to account for the actual 143 families.

In another study, Ruth Gruhn (1988) concentrated on what she calculated to be scores of “isolate languages” in the Americas, single tongues that have no identified relatives. She supposed that they were remnants of languages introduced as much as 35,000 years ago but that had been left isolated by subsequent events. Again this view seems highly unlikely in terms of archaeology. It is far more logical that at least some of the speech isolates resulted from later transoceanic incursions that failed either to flourish or to be assimilated.

Several instances of such arrivals have been documented by competent scholars, despite a general reluctance of historical linguists to address the problem. Especially notable is the case laid out in several publications by the late Otto von Sadvosky (for example, Sadvosky 1985; 1996). As a graduate anthropology student at Berkeley this Hungarian immigrant learned from the linguistic archives there that he could understand a good deal of the Wintu and related “Penutian” tongues used by tribes who inhabited central California when modern Americans arrived there. In a lifetime of subsequent research he demonstrated that those languages were related to the Ob-Ugrian branch of the Uralic family; his native Hungarian was also Uralic. He hypothesized that a group of emigrants left western Siberia in the first millennium BC and traveled east along the Arctic coast to Alaska, then coasted south as far as central California. He backed up this proposition by listing thousands of cognate terms as well as a large body of ethnographic parallels. He further concluded that there were several separate migrations by Uralic ancestors that came to roughly duplicate in California the relative geographical positions among their original homelands (Sadvosky 1984).

Ruhlen (1998) subsequently established that the Na-Dene family in North America shared a common origin with the Yenisei family located in western Siberia. Both had once been considered isolates on their respective continents. The migration of the first, Na-Dene, he supposed took place sometime between 11,000 and 3,000 years ago. In an e-mail (March 1999) to Sorenson Ruhlen accepted the possibility that the initial group of Na-Dene arrived by sea in coastal British Columbia where they became the Haida people. (Linguist B. Stubbs, who speaks Navaho, a Na-Dene tongue and has associated with members of that tribe for over 35 years, told me in a personal communication {Sorenson in 2010} that certain Navaho speakers have known of the Yenisei relationship for years and have even made occasional visits to their west Asiatic relatives.)

The late Mary LeCron Foster, a long-time adjunct professor of anthropology and linguistics at Berkeley, in a pair of substantial papers in 1992, concluded that, (1) Uto-Aztecan and California Penutian share a genetic relationship with Indo-European, the former (i.e., U-A) actually deriving from Proto-Indo-European; (2) Afro-Asiatic languages, and in particular ancient Egyptian, are genetically close to and probably ancestral to a group of languages in Mesoamerica, namely Mixe-Zoquean, Mayan, Zapotec, and Mixtec; and, (3) the Quechua tongue in Peru is closely related to the "Egyptoid" languages just mentioned, and also apparently to a Semitic tongue, perhaps Arabic. These connections, together with several mythological parallels she cites, "are so close as to throw doubt on an exclusive scenario of ancient Bering Straits crossings" (1992b; 1992a).

An expert on the Uto-Aztecan language family, Stubbs (2008), has demonstrated that this group of 30 tongues in northern and central Mexico and the southwestern U.S. is linked in some fashion with Hebrew/Arabic. This is

evidenced by more than 1,000 cognate pairs that Stubbs has identified. According to him the connection probably reflects the development of a creole language that took place in Mexico during the Formative era (1988; 2004; and personal communications to Sorenson) involving an intrusive Semitic-speaking group and a body of speakers of some Native American language.

Jones and Klar (2005) have made a convincing case from ethnography and archaeology, with some language input, that a Polynesian group arrived in the area of Southern California's off-shore islands in the period between AD 400 and 800, bringing with them specific nautical innovations. DuBois (1908) and Kroeber (1928) had earlier observed that the religion and mythology of the Luiseño Indians of that specific area seemed to be connected to Polynesia.

Other evidence for anomalous incoming peoples derives from human biology. This is of two sorts, data on visible physical forms or morphology and that from genetics. One would expect that this sort of information would become evident in conjunction with the intrusions of peoples indicated by language as just discussed. As far as I know, no scientist has investigated the genetics of the central California Indians to determine whether Sadovszky's data has biological backing. The same is true of Ruhlen's position in regard to the Na-Dene and that of Jones and Klar concerning the Luiseño, but that research would be worth pursuing.

Detailed investigation of the genetic structure of many American Indian groups has actually been limited. Tests of DNA in the late 1900s established the widespread presence in Amerindians of four haplotypes (sets of closely linked genetic markers which tend to be inherited). These were interpreted as representing four initial groups who entered North America via Bering Strait on the order of 13,000 years ago or earlier and have been considered by molecular anthropologists to be ancestral to all American native peoples (e.g.,

Crawford 1998). In a worldwide typology they were labeled haplotypes A, B, C, and D (later redesignated A2, B2, C1, and D1). However that broad labeling failed to accommodate the entire spectrum of New World data. Various anomalous findings involving different haplotypes have been lumped under the heading “Others.” They are usually supposed to represent genes from modern Indian subjects who had unacknowledged Caucasoid ancestors in the period since the arrival of Europeans thus “contaminating” the authentic ancient genome, but that interpretation has not been established.

There have also been rarely acknowledged sampling problems in Amerindian studies that casts doubt on the usual picture. Most American continental or hemispheric studies have utilized DNA samples from reservation populations who in some cases involved subjects of uncertain ethnic identity. Furthermore, until recently almost all research was limited to mtDNA or Y chromosome materials that provide data on only a tiny fraction of the genomic whole. The result of these indeterminacies is that “the real work is [only] now beginning to fully elucidate the genetic history of the two continents” (O’Rourke 2009).

A significant number of geneticists have been finding unexpected connections for certain Amerindian groups. Dillehay (2000, 242-243) summarizes that situation concisely: “. . . genetic studies hint at oceanic contacts between Asia and South America. For instance, after studying newly discovered alleles and virus strains among the living Cayapa . . . of Ecuador, Elizabeth Trachtenberg and her colleagues have determined that they have some molecular similarities to those in Southeast Asians and Japanese, but these similarities are absent in northeast Asian populations. The alleles and strains from Japan also are related in their molecular structure to those found in Native South Americans in Chile, Colombia, and Brazil. . . . For some

researchers, these southern affinities add strength to the proposal that ancient voyagers would have followed Pacific sea currents from Japan and the South Pacific to South America. Many other genetic and virus studies also suggest different degrees of distant contacts (see Trachtenberg et al. 1995; Hildebrand et al. 1992; Leon et al. 1995; and others cited by Dillehay 2000, 355, note 25).

Another body of information of interest involves the X haplotype. Presence of this feature in certain North American Indians was established in 1996. Since then research in a number of areas of the world have revealed its presence elsewhere, including in the Near East. Subtypes have now been differentiated. The North American sub-haplotype is now called X2a; it is not clear how this may relate to recently discovered Old World members of the X family of haplotypes (see, e.g., Shlush et al. 2008). If a scientifically credible relationship should be established to the North American complex, it would seem to indicate that at some point in time an Old World group arrived in America, obviously by voyaging.

The type of data that would show such a relationship might be like that provided in preliminary form by a commercial firm that offers personal DNA identification to Amerindians who wish by that means to establish their right to be entered on tribal membership rolls. The service's web site (DNA Consultants 2010) reports on a sample of 52 persons, most of whom claimed Cherokee maternal ancestry. These folks have been puzzled to learn that they are connected to Middle Eastern groups. "Haplogroup T emerges as the largest lineage, followed by U, X, J and H." "Similar proportions of these haplogroups are noted in the populations of Egypt, Israel, Lebanon and other parts of the eastern Mediterranean." No "normal" scientific DNA studies have reported the presence of these haplotypes in America. (There is some {disputed} evidence for the presence of Hebrews including inscriptions in the

eastern United States—see, for example, Gordon 1993.) While far from definitive, this limited information suggests that more focussed research might reveal additional information about peoples intruding from the Old World.

One other source to examine for evidence of incoming groups from esoteric locations is art. Some Mesoamerican figures carved on stone suggest the arrival of people from the Old World. One that has particularly caused comment by archaeologists and art historians is on Stela 3 at La Venta. One of two figures there is so visibly different from the norm for men shown in other Olmec art that it led art historian Proskouriakoff (1968, 121-122), artist Covarrubias (1957, 77) and archaeologist Bernal (1969) to agree that the scene on the stela shows two leaders of “racially distinct” groups posing as though in a formal encounter. The bearded, foreign face on one of them has evoked the labels “Semitic” and “Uncle Sam” because of the “hooked” or aquiline (“Armenoid”) nose it displays (Coe 1965b, 755; Drucker 1981, 44). That physical feature is particularly reminiscent of some peoples of the Mediterranean Levant. A similar facial form is seen on a number of other examples of Mesoamerican stela art dated to the first millennium BC.

A still more interesting source of evidence for foreigners arriving in America is the heads of the little clay figurines that abound in Mesoamerica and part of Andean South America. As reported above, one such head was unearthed in 1933 in a ruin of Aztec date (García-Payón 1961). It was obviously Roman in style. Mexican archaeologists Hristov and Genovés (1998; 1999) reexamined original sources on the context of its discovery and established that it was indeed found in a pre-Columbian stratum. They also submitted it to a thermoluminescence dating test; the suggested date of manufacture was around AD 200. Two experts on Roman art had previously dated it thereabouts on stylistic grounds. Several reports of other Roman

figurines in Mexico have surfaced but no other objects can now be located to test. The best guess for its source is that a Roman ship had come ashore on the Gulf of Mexico. Perhaps that was nothing more than an abandoned ship, although that seems to stretch a point.

Also highly interesting are collections of the little heads especially those gathered by Wuthenau (1965; 1975) and González C. (1991). Sylistically these artifacts appear ancient, and there is no reason to think they are not ancient. In fact quite a number of them are from established archaeological contexts of comparatively early date. Furthermore suggestions by some observers that they represent merely random artistic anomalies rather than portraits of real individuals are quite unbelievable. González (page 39) describes and shows “heads from La Venta represent[ing] individuals with aquiline noses, with beards carefully arranged [These representations] coincide with the racial characteristics . . . [of] the . . . personage on the monument [Stela 3], also from La Venta, on which . . . is clearly observed a lineage or a race completely different [from] . . . Olmec classic iconography” Interestingly González found that all the “Chinese-looking” heads in his collection came the giant site of San Lorenzo in the Isthmus of Tehuantepec, suggesting that an intruding ethnic group had been localized at that site.

Chadwick (1974) and Piña Chan (Piña Chan and Covarrubias 1964) concurred with the proposition that one or more physical types intruded into Mexico from Eurasia other than via Bering Strait.

Figure 7a through 7i (below) show a selection of images, mainly from Wuthenau, that makes clear that a variety of non-Amerindian ethnic groups—Black African, Mediterranean, Near Eastern, Southeast Asian, East Asian--were present anciently in Mesoamerica. Their ancestors could only have arrived by sea. Some of those types are also visible in South American

figurines, especially those from southern Colombia and Ecuador to which area Mesoamerican folks spread in the early AD centuries (Errázuriz 1980; Fauria 1986).

These facts constitute a puzzle for the conventional interpretation of American ethnic history. Berjonneau and Sonnery (1985, 268) commented that “In Mesoamerican art it is not unusual to find faces with somethat ‘Negroid,’ ‘Semitic’ or ‘Chinese’ features,” while Irene Nicholson (1967, 19) posed the rhetorical question, “How is it that the New World before the arrival of the Spaniards contained ethnic types of such a wide diversity that there have been clay and stone portraits discovered representing practically every known human race?” Arrival of transoceanic voyagers at various times provides the only plausible answer.

Evidence of the arrival of intrusive groups on the basis of physical or morphological characteristics can also be seen. This mode of analysis is not very popular these days, but some work done in the past has proven informative and likely significant. One of the largest and most careful was a comparative study of skulls (n=193) by Wiercinski (1972a; 1972b) considering pretty much all of the Formative era (and other) cases then available for study from throughout Mesoamerica. This work led him to these tentative conclusions: (1) in addition to “basic Ainoid” (Ainu of early Japan) and Mongoloid features, (2) the area’s inhabitants represented a chain of related populations who were not typical Mongoloids; (3) visible Negroid traits in skulls from Olmecoid Tlatilco would seem to have arrived from North Africa; (4) sporadic groups of immigrants from the western Mediterranean area are also indicated; (5) a particular constellation of traits could be from the eastern Mediterranean; and (6) possible Chinese elements also appear. His

ideas are not definitively established but tend to confirm what other data tell us.

A few paleobiologists continue today to look for historical links between human groups basis of morphology with suggestive results (e.g., Steele and Powell 2002). Some anthropologists have felt that data of this sort provide evidence of transoceanic arrivals in the Americas (e.g., Bosch-Gimpera 1970). Dillehay (2000, 286), who is no diffusionist, urges that “archaeological and human skeletal diversity that is showing up increasingly in eastern Brazil . . . may suggest early contacts with Africa, Australia, and Oceania.”

Other characteristics point in the same directions. Markedly different skin colors represented in art are one such. For example, artist Ann Morris, who copied the murals at Chichen Itzá for the Carnegie Institution, observed that on one of them a class of painted figures had “natural, light-colored skins, [and] . . . extraordinary yellow hair, very long and thick . . .” She went on, “it is difficult . . . to reconcile all of these physical qualities with [the appearance of] a member of the [Maya] race. The painter, in depicting the hair and skin with such care in order to contrast them with their black, armed captors, evidently had some notion of a distinct physical difference in his two sets of actors” (Morris 1931, I: 446, Plate 159). That difference in physical type may lie behind the statement in the *Popol Vuh*, the native book of highland Guatemala, that in a certain area there were “the black men and the white men” (Goetz and Morley 1950, 172).

Research on beards shown in Mesoamerican art is still another line of evidence. The earliest occurrence of beards in art was in the mid-first millennium BC. They are most commonly shown on men’s faces during the period from about 300 to 50 BC, then a decline in frequency prevailed through

the Classic era (Magleby 1979; cf. Wirth 2003, 11-26). At the peak of their popularity beards were often shown wholly as fulsome as those appearing nowhere else in the world except the Near East (for instance, see the assortment from La Venta in González C. 1991). Ekholm (1975, 152) posed the key question about this matter in a comment about a wooden sculpture from the Maya area that displays a man with an elaborate handlebar mustache; it “raises the often-argued question as to whether the Mongoloid American Indian could have had sufficient facial hair to grow a heavy beard—or a mustache such as this—and who might have been the model for this figure.” The same question applies to baldness (a genetically determined feature virtually absent in Amerindians). See Figure 7f below for a bald European-looking pre-Columbian figurine head from Mexico.

We have seen considerable and varied evidence for the presence in the areas of ancient American civilization of minority populations of ethnic groups from many regions of the Old World. They seem to demonstrate that transoceanic voyagers did arrive and that their descendants survived and flourished sufficiently to influence the majority populations among whom they lived, as chapters 4 through 7 indicate.

Chapter 10.

An Historical Resumé of Ancient Voyaging

We have examined a good deal of evidence that some humans have long been movers and travelers across the face of the globe. Most people have no doubt been conservative sticks-in-the-mud happy enough stay with the status quo, yet seemingly a minority have been impelled to escape their local situations, seeking “greener grass on the other side of the[ir cultural] fence,” or perhaps just to satisfy their curiosity about what is out there, what Helms (1988) calls the Ulysses factor. That curiosity has often been sparked by stimuli such as lands espied from afar or exotic artifacts washed ashore.

As discussed in Chapter 2, travel by sea began among Lower Paleolithic hominids in island Southeast Asia as much as 850,000 years ago. Australia was settled by voyages out of sight of land on the order of 50,000 or 60,000 years ago. The Solomon Islands were inhabited 27,000 years ago after an open-sea crossing of over 100 miles. By 10,000 years ago many islands (e.g., Corsica and Japan) had been reached by sailors.

Prevailing winds and currents naturally helped to determine which areas of the earth made the most plausible “nursery” for the development of boats and sailing, as well as shaping the most likely long-distance routes from which voyages issued. The most productive experimental zone may have been the islands of Southeast Asia; other areas of significance for the encouragement of maritime activity were the Mediterranean, the Persian Gulf, the Bay of Bengal, and the sea around Japan.

We can only guess at the reasons why seafarers by 6000 BC (voyaging episode I) set sail on a voyage that would end up in South America. Their journey may have been accidental. Whatever push or pull they felt, their craft

and people aboard it survived the rigors of the voyage, for, when they finally went ashore, they carried with them hookworms from Asia that would infest their descendants. They may have set out with the intention to follow the track of earlier vessels that had reached North America via the North Pacific current, as suggested by Fladmark (1986) and other researchers, but found themselves shunted onto a different track because of still-primitive navigation capability or by unfortunate weather.

It is certain that whatever American area they reached would have been only sparsely populated by non-agricultural groups, since that was the condition in the entirety of South, Central and North America at that time. Survival at landfall would have been difficult, but survive at least one group did, for in no other way can we explain the transmission of hookworms that were to afflict the next 300+ generations of South American peoples.

The cultural adaptations such immigrant groups underwent in order to make a success of life in their new environment must have been difficult. Much of the resulting culture(s) would have depended on the creativity they manifested in order to forge a successful life on their new scene. (Of course we can safely assume that they borrowed ideas and behavior patterns from “indigenous” peoples they encountered and mixed with.) Of course at this distance in time we have no indication of what particular knowledge they brought with them across the sea versus what they invented or what they borrowed from their new neighbors.

No one knows how many voyages might have succeeded in reaching the New World in the remote era from the eighth to the third millennium BC. We are certain of only one fact, that determined, lucky sailors could cross the oceans safely. Hence it is highly likely that over thousands of years other

seacraft either sailed intentionally or drifted across the Pacific, and probably the Atlantic, to the Americas.

A rationale for this expectation is offered by anthropologist John Greenway (1977): "... any boat that sails east from Asia and manages to miss the islands with which the Pacific Ocean is peppered, can only end up in either of two places: at the bottom [of the ocean] or in the Americas." Over the years there must have been hundreds of thousands of rafts and boats in use off East and Southeast Asia. (Ling {1956} reported that in 1955 there were at least 14,000 "raft boats" in use in Formosa/Taiwan alone). Surely some early vessels were blown adrift. No fewer than 15 drift vessels from Japan landed on the northwest coast of North America in the first two-thirds of the 19th century (Davis 1872). Quimby (1985) estimated that "some thousands of disabled vessels [must have] reached American shores during the first 17 centuries of the Christian era," and Shapiro (1964) made a similar point. It would be incredible if none of the thousands of vessels sailed or swept out to sea off Asia over the generations were carried to landfall in the Western Hemisphere with survivors aboard. A few crews may even have contrived to make the return trip to Asia, their stories spurring new voyages by subsequent adventurers. From such could have arisen the notion of Fu-Sang, the fabled land supposed by the Chinese to lie eastward in the ocean (Leland 1875).

Because such early voyages and landings were no doubt made by small groups it might be argued that they would have had minor, if any, cultural influence on the areas where they landed. (Some naïve scholars have insisted that such parties "would have been immediately killed or sacrificed" by local populations they encountered, but there is no empirical evidence that anything of the sort would have happened regularly if at all.) Landing in territory that was lightly populated, some early immigrants could have become established

as independent societies that may then have been little influenced by “indigenous” peoples; in the long run they could have constituted a distinct cultural force. (Stengar {1989} reported excavating a site in the state of Washington that yielded “Japanese influenced” pottery, in a region where no other ceramics were known. Those remains were dated on the order of AD 1400. That group must have been of the intrusive type we are talking about.)

Even some sympathetic to the idea of arriving voyagers (e.g., Meggers 1963) have suggested that vessels and crew reaching the Americas may have brought mere cultural “embroidery” of little fundamental significance for the development of native American cultures. Others disagree. Non-diffusionist Gordon Willey (1964), for example, thought that if pottery arrived with Jomon voyagers to Ecuador, as Meggers believed, that would have been of great cultural importance, and the same with regard to religious elements. If transpacific contacts to western South America did occur, Willey ventured, they were probably of “signal importance” to the culture history of the New World. But conjecture does not settle the matter. As Tolstoy (1974) said, “Once we acknowledge that there were transpacific contributions to native American culture at all, we have no basis but empirical research for limiting the scope of those contributions.”

Ship-borne immigrants would have carried markedly different ideas and behavior patterns that had originated in more advanced areas of Eurasia than those that had come by land across the Bering Strait. The interplay between “indigenes” and newcomers could have shaped the regional traditions that characterized what American archaeologists call the Archaic period, between about 8000 and 2500 BC (see, for example, Clark and Cheetham 2002).

Episode II involved a voyage across the Pacific from China to America and return. (There is no hint that any culture in the New World had by this

time developed sufficient nautical capability to voyage to China.) The only evidence for this voyage is specimens of the American native plant, the peanut, excavated in China that were dated by radioactive carbon at near 3500 BC (Chang 1973; calibrated). Peanuts were still being grown in China during the Han dynasty 3,500 years later.

Both the ability to sail and a feasible route across the North Pacific via the Kuro-Shiro current are apparent when we consider the discovery of pottery of the Jomon people of Japan in America (pottery from a cave in southern China is the oldest in the world, from a level radiocarbon dated at 20,000 years ago—Tang 2012; Jomon-style ceramics began in Japan before 12,000 BC (Aikens 1995). Since Estrada and Meggers (1961) first compared decorated pottery of the Valdivia archeological phase in coastal Ecuador with Jomon pots, their proposal has been considered controversial by some archaeologists, yet influential American scientists have accepted the view. Willey (1971, 16), Kidder II (1964, 474), and Jennings (1968, 176) were joined by James Ford (1965; 1967) who spoke of “amazing resemblances” and “essentially indistinguishable” ceramics revealed by comparisons. He concluded that “Meggers, Evans, and Estrada have demonstrated that human history is a single connected story.” After visiting Japan and examining further collections there, Meggers (1987) reported other parallels and even earlier stylistic ties, as well as further C-14 dates for Valdivia material as early as ca. 4000 BC (calibrated). We know in any case that Jomon seafarers sailed very long distances.

Of course Japan is not the same departure point as China, whose culture we have examined for parallels. And travelers from the mainland may not have gone as far as Ecuador, as Jomon sailors presumably did, but the Chinese had access to the same North Pacific current headed eastward. So a roundtrip

voyage from China to tropical America is not only plausible, we can be certain it occurred, because of the presence of the peanut during the Neolithic of North China.

Another historical step toward a transoceanic reach by voyagers took place in India. Again the evidence is circumstantial, but quite overwhelming. As explained in Chapter 3 an Asiatic cotton, either *Gossypium arboreum* or *herbaceum*, reached the New World in time to combine with a local species to become a genetic ancestor of all species of American domesticated cottons (Silow 1949, 112-8). One of those descendants, *G. barbadense*, is attested archaeologically at Huaca Prieta, Peru, at about 3100 BC (calibrated), so the arrival of *arboreum/herbaceum* and its hybridization with an American species had to have been still earlier. But perhaps not by much, for the development of nautical skills as well as the loom that seems to have been transferred with cotton from India could hardly have been much before 3100 BC, based on what little is known about southern Asia's culture history at that early period.

How did Indian sailors know that America even existed before they set sail? Possibly word about the land-from-which-the-peanut-came was passed on from China, yet the course from India to the New World would have been entirely different than that followed by Chinese mariners. From South Asia the track followed must have passed across the Pacific near the equator.

Voyaging episode IV is assumed to have included the date 2200 BC. Four kinds of "beans" were apparently moved from some American location to India: kidney and lima beans, a close relative called the phasey bean, and the little-related "jackbean." The first three appear in Indian archaeological sites early in the second millennium BC. On the basis of eight Sanskrit names the jackbean probably arrived at about the same time. And the fact that Levey

(1973, 55) traced names for *Phaseolus vulgaris*, the kidney bean, from medieval Arabic *lubiya* (Hindi *lobiya*) back through Akkadian *lubbu* to *LU.ÚB* in Sumerian apparently puts this bean in Mesopotamia by the end of the second millennium BC; the Sumerians were in trade contact by sea with the Indus Valley (“Meluhha”) culture on the order of 2500-2000 BC (Parpola and Parpola 1975), and presumably the kidney bean could have passed from the Indian subcontinent to Mesopotamia by that means.

Whether the voyagers who brought American beans to South Asia were at home in India or in America we cannot know. As noted earlier the level of cultural development in America does not appear to have been high enough at this early date to initiate transoceanic exploration from that side. Chinese (or perhaps intermediaries from Indo-China) appear, however, to have sailed rafts to Ecuador or Peru by roughly this time, for raft-navigation based on Chinese models was begun off the coast of Ecuador in the third millennium BC (see Chapter 2). We cannot be sure whether the successful planting of the beans in the new India area demanded special knowledge (seasonality, soils, and moisture parameters) or not. It might be that some American personnel accompanied the crew who provided that knowledge. Nevertheless possibly some Native Americans (likely from the area of Ecuador) fairly quickly became adept in raft sailing, and themselves undertook voyaging adventures in the Pacific.

Distinguishing one voyaging episode from another is a problem. What I have called episode V is dated largely on the basis of multiple Sanskrit names—an amazing 45 different ones reported for *Mucuna pruriens* and a considerable number also for *Bixa orellana* and the cashew nut, *Anacardium occidentale*. Those three plants might have arrived as early as episode IV, but it seems more likely that a renewed period of voyaging brought them over the

ocean near the end of the third millennium BC. Again it is impossible to be sure whether the sailors involved were Asian or American.

Movements both from and to China are indicated by the set of species categorized as episode VI. As noted in Chapter 3 the small barkless, edible dog known in pre-hispanic Mesoamerica and Peru has recently been found to provide a genetic match with canines in China who looked the same and were used in the same way. The presence of *Luffa cylindrica*, an Asiatic native plant, on the Pacific coast of Guatemala was also reported in Chapter 3 at this date. At around the same time grain amaranths were introduced from the New World into East Asia where they spread dramatically. On this basis it is not only reasonable but necessary to suppose a roundtrip either from China to America or vice versa.

In both target areas the economic impacts of these exchanges proved sizable. Dogs kept for sacrificial ends, but even more for food, played significant roles in the resultant societies. The little dogs became one of the main sources of protein in the Mesoamerican diet. The Aztecs served this meat routinely to the Spanish conquerors of the 16th century, and they relished it. Meanwhile in Asia grain amaranths became one of the important foods eaten by groups in the interior of much of Asia.

A number of researchers have concluded on the basis of studies of art and archaeology that voyagers from Shang China arrived in Mesoamerica around 1200 or 1100 BC (Meggers 1975; Schneider 1977; Jairazbhoy 1974; Shuang 1992). They see parallels to features of classic Olmec civilization. Furthermore, Gonzalez C. (1977) said that on the basis of his collection of thousands of Olmec figurines that “almost all” of the “Chinese looking” heads in his extensive figurine collection came from the site of San Lorenzo in the Isthmus of Tehuantepec whose primary date of occupation was 1200-1000

BC. The cultural comparisons made by these scholars, including some of the features listed in Chapter 5, are consistent with the arrival of one or several transpacific vessels that would have been part of voyaging episode VI. Moreover, Chinese similarities to Chavín art in Peru show that some voyage or voyages also reached Peru, although the date for that is still in some question.

Among the organisms transferred in episode VII the grouping of four drugs/narcotics (*Argemone mexicana* {prickle poppy}, *Nicotiana tabacum* {tobacco}, *Erythroxylon novagranatense* {coca}, and *Cannabis sativa* {marijuana}, the first three coming from America) suggests an intense interest in psychoactive substances on the part of Indian voyagers. Two pests that inhabited mummy bundles (*Stegobium paniceum* and *Alphitobius diaperinus*) also indicate that some cultural features under the rubric of “mummification” were exchanged between Egypt and the Andean area. The exact relationship between Egypt and India that resulted (?) in transfer of tobacco to the former from the latter is unclear. The (faint?) possibility remains of a direct voyage to or from Egypt across the Atlantic that carried the practice of ingesting such substances and also moved the mortuary pests.

The arrival of the American plants frangipanni (*Plumeria rubra*), the pumpkin (perhaps) and the chilacayote (*Cucurbita pepo* and *C. ficifolia*), and the two amaranths (*Amaranthus caudatus* and *A. spinosus*) in India is credited to voyaging episode VIII dated around 1000 BC. *Mycobacterium tuberculosis*, the cause of tuberculosis, arrived in America perhaps around the same time and is best accounted for by an infected person or persons from Asia having arrived by the ship that on its return trip carried the plants mentioned. This voyage, or these voyages, would be at least the fifth contact between India and America (more likely Ecuador/Peru than Mesoamerica?).

Accumulated lore about sailing directions and conditions must have been well established by this time. Another alert may be appropriate at this point that the biological data provide us with no more than the minimum number of voyages that took place across the Pacific; there could well have been other, exploratory trips for which we have as yet no confirmed proof, and in fact the five plants supposed to have made the trip in this episode seem more likely to have traveled on two vessels than on a single one.

Voyaging episode IX carried three, and perhaps four, floral species to the Mediterranean/Near East. From there they were transferred to India. As documented in Chapter 3 art representations of the pineapple (*Ananas comosus*) show its presence in Assyria soon after 900 BC, as well as in Turkey, Israel, Egypt and at Pompeii. In India, besides having two Sanskrit names, the fruit appears in art of the fifth century AD. The plant's attestation in Assyria and elsewhere in the Mediterranean/Near East at such an early date supports the idea that the voyage that brought it arrived via the Atlantic. The same situation is found in relation to *Cyperus esculentus*, the American plant mentioned in a Babylonian record but which also bore two Sanskrit names. *Portulaca oleracea*, purslane, a "troublesome weed" but edible herb, was mentioned in texts "of pharaonic times" as well as carrying up to six Sanskrit names. The pumpkin, *Cucurbita pepo*, is credited by Aiyer (1956, 57) with mention in the Sanskrit text of the Atharvaveda which he dates before 800 BC. Inasmuch as the translated term "pumpkin" appeared also in historical records from Persia, Iraq, Arabia, Egypt, and Greece (Johannessen and Parker 1989b, 16-17; whether referring to *C. pepo* is not certain), it is plausible that this plant too may have arrived via an Atlantic voyage. Taken together these data indicate the pumpkin's probable transport from America to the Mediterranean then on to India.

A major concern is to identify the nautical mechanism responsible for the massive movement of Near Eastern ideology and religion, and probably other aspects of culture, identified in Chapter 6. Those cultural elements linked the Near East and Mesoamerica in vast detail. The date is not certain but on cultural grounds it is likely to have been around the middle of the first millennium BC, although part of the complex might have crossed over earlier. Alcina Franch's (1958) analysis of a large sample of stamp seal designs from both sides of the Atlantic showed that that artifact occurred in a band from the Near East westward through Italy, Spain, North Africa, the Canaries, the Caribbean and Nuclear America between 3000 BC in the origin area and 1500 BC when these seals are first present in Mesoamerica. We have no particular biological evidence for such voyaging westward, but there is evidence for possible travel from the Mediterranean/Near East in connection with voyaging episodes IV, VII and IX. In respect to IV, the Sumerian word for the kidney bean places the plant in Mesopotamia before 2000 BC when the Sumerian language was still in vernacular use. Some transoceanic voyage bringing the American bean obviously took place by that time. Whenever that was it could have carried some Near Eastern cosmological concepts and ritual practices on its westward trip at the time of episode IV. Or during episode VII the ship that brought tobacco to Egypt (if the plant did not come via India) could, on its trip to Mesoamerica around 1300 BC, have been instrumental in transmitting additional elements of Near Eastern culture. A third option is that in episode IX the return voyage westward of the ship that brought the pineapple also carried Near Eastern features of ideology and religion. Or all three possibilities could have been involved as mechanisms.

But none of those possibilities is likely to account for the scale and complexity of the transfer of ideas that Chapter 6 documents as having crossed

to the New World. A cultural movement of the scope indicated there could only have come about by a conscious voyage or voyages of colonization involving more than a minor boatload of sailors. Such may or may not be included in or implied by the present list of voyaging episodes. Chapter 8 recounts a number of traditions in Mesoamerica that tell of pre-Columbian colonizing voyages, some of which are said to have originated in the Near East. In the light of the parallels discussed in Chapter 6, it can be supposed that a major act or sequence of cultural transplantation(s) took place. Whatever biological exchanges these involved remain unclear in detail, but that there were such consequences, yet to be discovered, seems highly likely. That Chapter 6's features of ideology and religion became so widely and integrally involved in Mesoamerican civilization in its developed stage agrees with their arrival in the second and/or first millennium BC, the Mesoamerican Formative era.

Voyaging episode X shifts attention back to the Pacific and to East Asia. The definition of this episode supposes the transfer of five plants. The daturas (a genus of plants employed for narcotic, hallucinogenic and medicinal purposes), of American origin, were widespread in south, southwestern and East Asia. *Datura stramonium* and *D. metel* were present in India where one had seven Sanskrit names and the other at least four, arguing for the genus' arrival in India on the order of 800-700 BC. The importation of those plants from America indicates a continuation of the search by people from India for narcotics/stimulants. That search curiosity could have played a motivating role for exploitation and commerce comparable to the role of "spices" in Western Europe in the 15th-16th centuries AD.

One fruit, *Annona reticulata*, was known by at least four Sanskrit names. Moreover the fruit is called *ata* in Malabar, *ate* or *atte* in the

Philippines and *ahata* or *ate* in Mexico (Pokharia and Saraswat 1999, 97). Cunningham (1879) identified this fruit sculpted on a stone panel at Bharhut Stupa, India, dated to the second century BC, although no one seems to have believed him for years. The species was also mentioned in a text of the sixth century BC. Both the fruit of *A. reticulata* and *A. squamosa* are called in modern Malabar “the fruit of Lord Rama,” confirming considerable time-depth of the plant in Indian tradition. Seeds of *A. squamosa* have been excavated from a cave site on the island of Timor that may date as early as the third millennium BC (Glover 1977, 43), and at another site in India they were radiocarbon-dated at c. 800 BC (Pokharia and Saraswat 1999, 101; calibrated). The *squamosa* bears four Sanskrit names besides being mentioned in the ancient Ramayana text. *A. cherimolia* appears only on a thirteenth-century temple sculpture (Johannessen and Wang 1998, 16-17), but probably it was transferred from America at the same time as the other two annona species.

The fact that native vernacular names for the annona are clearly related in Malabar, the Philippines and Mexico suggests that at least one actual person from Mexico accompanied the plants and their seacraft on the return trip to South Asia, for instead of substituting a translation name for the Mesoamerican source term, at least some farmers in south India seem to have copied the plant’s name as the discoverers heard it from the tongue of the American expatriate(s) accompanying them (the name eventually reached the Philippines from India, or was much later transferred by the Spaniards engaged in the Manila trade).

At about the same time as episode X developed, around the eighth century BC, so did XI, but from (southern?) China instead of India. Two species were feasibly transferred by this means, *Morus* sp., the fig tree from

which bark cloth and paper were manufactured, and *Gallus gallus*, the chicken.

Tolstoy (1963) argued powerfully that the Southeast Asian technology and tradition of bark-cloth manufacture were transferred to Mesoamerica, probably in the early part of the first millennium BC. A confirming discovery was made by MacNeish and colleagues (1967, 85), none of them sympathetic to the idea of long-range diffusion, of a particular form of stone bark-beater at a site in central Mexico that was so similar to an Indonesian form that they considered it “extremely difficult” to believe in its independent invention. Bark cloth/paper technology seems to have been accompanied by specimens of *M. alba* or *M. rubra*; those two species plus *M. nigra* were present in Mesoamerica before Columbus, where they were used in the manufacture of bark cloth and paper. Use of *M. alba* for similar uses is very old in China according to tradition (Bretschneider 1892, 203, 328-9). It is assumed here that one or two species of mulberries, and the accompanying technology of paper-making found in Middle America came via a south China raft ship that made a stop in southeast Asia (there is no satisfactory evidence of transoceanic sailing capability directly from those islands as early as this).

Multiple introductions of Asiatic chickens (*Gallus gallus*) are required to account for those present among pre-Columbian Native Americans in Chile (see Chapter 3). Non-European black-boned, black-meated chickens were used ritually by native peoples in Latin America (Johannessen et al. 1984) in a manner distinctly recalling Chinese usages. Even more telling is that a reconstructed proto-language attributed to the bearers of the Olmec art style in Mexico (Campbell and Kaufman 1976) and dating to the second millennium BC contains terms for hen and cock (Wichmann 1995, 76, 276). An effigy of a chicken attributed to a pre-Columbian culture in Peru is shown as Figure 16 in

Sorenson and Johannessen 2009. Finally, actual chicken bones have been excavated at a Classic Maya site (Teeter 2004).

Both some Chinese and American scholars have been prone to speak of “a Maya-China cultural continuum” that supposedly stretched across the Bering Strait and into Mesoamerica long ago (e.g., Chang 1989); its remnants are claimed to account for similarities in art styles and cosmology at the extremes of the supposed continuum, that is, between Shang China and Mesoamerica. This notion has always been left vague, but even a little thought demonstrates the lack of reality behind it, as Wiesheu Forster (1998) argued effectively. How could a cultural continuum that existed millennia ago have left stylistic evidence only at the two ends of its arc but little of the supposed style in the intervening stretch of ten thousand miles through Siberia and North America? The obvious answer to this puzzle is that the similarities between the Maya civilization and China can only be understood plausibly as due to transfer by direct ocean voyages, not to any hypothetical continuum.

Chapter 3 presented information on the Kyrenia (Crete) shipwreck which marine archaeologists found to have employed layers of agave leaves as caulking inside its hull. Since *Agave* species are exclusively American, the builders of this Greek ship of the third century BC must either have used (transplanted) plants growing somewhere near the Mediterranean Sea, or the vessel itself must have reached Mexico where it was refitted. Some have doubted that the plants really were *Agave* sp., but J. R. Steffy (2001), one of the archaeologists in charge of excavating the ship, says that identification of the genus was made at the Royal Botanic Gardens at Kew as well as at a major institution in the USA.

Another maritime excavation seems to confirm the Kyrenia find. The New Scientist (September 2010, at

<http://www.newscientist.com/article/dn19436-2000yearold-pills-found-in-greek-shipwreck.html>) reports that a 130 BC shipwreck off Tuscany, Italy, that was investigated in 1989 yielded a box of pills (medications) that were only recently researched by DNA analyses of the contents. The ingredients included the sunflower, *Helianthus annuus*, an American species heretofore shown to have reached India by the fourth century AD (see below). For this plant to have come into “standardized” medicinal use by Greek physicians by 130 BC suggests that it probably reached the Mediterranean at least a century before, one supposes directly from Mesoamerica (where it was known more than 2,000 years earlier). Its time range would fit voyaging episode XII.

Episode XIII was a heyday for India voyagers. Not only were a substantial number of plants transferred to that land but much in the way of cultural transfer was left in Mesoamerica as a kind of balance-of-payments. According especially to Kelley (1960; 1972; 1974; 1975) as well as others, important elements of the Mayan calendrical and cosmological systems were borrowed from India, apparently between the fourth and first centuries BC. Yet there is no one critical date we can establish for this exchange; several voyages were likely involved, perhaps beginning in the third century. I assume that a considerable number of the cultural parallels listed in Chapter 4 were introduced to Mesoamerica then. The features of culture transmitted to India at that time we have no way of distinguishing, but from the number of Sanskrit plant names we can assume that some elements beyond the plants themselves could have been carried over the Pacific. Assuming that the sailors were from India seems obvious, although some native Americans could also have been employed.

Plants brought to south Asia at this time probably included *Carica papaya* (the papaya), *Lycopersicon esculentum* (the tomato), *Psidium guajava*

(guava), and maize (*Zea mays*). (Although corn is known from the island of Timor in Indonesia dating possibly as early as the third millennium BC {Glover 1977}, it might not have reached India until this later moment. The evidence for this set of plants is their appearance in dated art, mention in Indian documents, and names in Sanskrit. Shared also were three species of flowers, the four-o'clock (*Mirabilis jalapa*) and the marigold and dwarf marigold (*Tagetes erecta* and *T. patula*), both of which were and are used in both Mexico and India in the decoration of sacred images and in connection with ceremonies having to do with the dead.

The American sunflower, *Helianthus annuus*, appears in Indian art in the second century BC (Gupta 1996, 86). As noted in the discussion regarding episode XII, the plant is now known to have been in use in Greek medicine around the same time. We have no way of establishing whether a voyage across the ocean to the Mediterranean or one to India, or both, was responsible for the plant's presence in the two regions.

Episode XIV seems to have carried to India, probably on two or more voyages, the following American plants: *Canna edulis* (Indian shot), *Capsicum* sp. (chili pepper), *Cucurbita maxima* (Hubbard squash), *Maranta arundinacea* (arrowroot), *Mimosa pudica* (the sensitive plant), *Opuntia dillenii* (prickly pear cactus), and *Sapindus saponaria* (soapberry). The time would have been the first century AD. Most of the evidence for these seven species is lexical, so the precise date of transfer is less than certain although surely pre-Columbian. Trips at the indicated time could have given opportunity for more cultural transmissions (including to America). Certainly the number of species transferred per century was picking up, and so would have been the number of attempted and successful voyages.

The much-argued movement of the sweet potato (*Ipomoea batatas*) from South America into Polynesia is now established to have occurred on the order of AD 400 as episode XV. But the Polynesian distribution's relation to the fact of the sweet potato's presence in China by AD 300 and also the fact that the tuber bears three Sanskrit names in India are left unclear.

Number XV is assumed also to have moved *Cucurbita pepo* (pumpkin) and *Pharbitis hederacea* (ivy-leafed morning glory) to China. A fifth-century Chinese work on agriculture used a term later applied to *C. pepo* among a list of "various pumpkins and gourds ... cultivated in China." The phrasing suggests the species may have been present before that date. In India *C. pepo* also bore two Sanskrit names. *P. hederacea* is referred to in another Chinese document of the sixth century (Bretschneider 1882, 77-79), and it too had a Sanskrit name, which may indicate its transport direct to India via episodes XIII or XIV.

Interestingly, and perhaps significantly, several names for the pumpkin (as well as for the moschata squash) current in India today (e.g., *cumbuly*, *kumbala*, *koomra*, *kumhra*) show the same root (*kum*) as Mayan names for those plants.

Rickettsia prowazekii, and *R. typhi*, agents for endemic and epidemic typhus, were apparently in Ecuador and Peru by the sixth century AD (Alchon 1991, 21). They could have been brought there on a ship bringing some of the plants being exchanged with Asia.

By the time of episode XVII in the sixth century AD, voyaging to America and back to India must have been based on a good deal of nautical lore and actual sailing experience. This is not to say that voyages were commonplace, but it is likely that there was knowledge enough of how to make the voyage, or to try to, that adventurous crews at times thought about

the possibility and sometimes actually outfitted vessels and made the attempt. Based on an increasing corpus of sacred art that showed crop plants and on the use of Sanskrit names, we can detect significant biological results in India. It is a safe supposition that a variety of cultural consequences were also felt at both ends of that trajectory.

Prominent among the introduced crops due to this voyaging episode were three species of agave, the ubiquitous fiber plant of Mesoamerica. These agaves had five Sanskrit names among them. At least one species of the American genus *Physalis* also arrived about now. The taxonomy of this genus as used in nineteenth and early twentieth century sources is confused, so we are not sure of the precise species in today's terms. The common expressions for this fruit range from ground cherry ("a sort of wild tomato"), winter cherry, and Cape gooseberry through husk tomato to the tomatillo. Species reported in India included *P. peruviana*, *P. lanceifolia*, and *P. pubescens*, each of which was called "ground cherry" by early botanists. At least two Sanskrit names were used for "ground cherry." However, Dioscorides, the first-century Greek physician, also described a *Physalis* species that has been translated "husk tomato," so possibly episode XII introduced it earlier across the Atlantic perhaps along with the agave of the Kyrenia shipwreck.

Meanwhile Shen Nung ("the father of Chinese medicine"), according to tradition dating to the third millennium BC, but who probably lived much later, left a register of contemporary crops that included three American cultivars--maize, purslane, and the pumpkin--along with the "winter cherry," *P. alkekengi* (Bretschneider 1882, 32); while we are uncertain about exactly what *Physalis* species reached the Eastern Hemisphere, we are confident that there was at least one, and it seems to have become widespread in Eurasia.

On the basis of its two Sanskrit names *Cyperus esculentus* (the bulbous edible sedge) also appears to fit into this episode, along with two weeds *Alternanthera philoxeroides* and *Erigeron canadensis*, both of which also bear a pair of Sanskrit names.

It was explained in Chapter 3 that *Gossypium barbadense*, an American prototype tetraploid cotton, appears too in India with a couple of Sanskrit names. The most likely way that could have happened is by its being brought from America by a voyage at about the time of episode XVII or earlier.

China was a recipient of biological exchange dating to episode XVIII around AD 600-800 of *Cucurbita moschata* (butternut squash), *Diospyros ebenaster* (black zapote), and *Pachyrhizus tuberosus* (the yam bean). A porcelain teapot representing clearly a moschata squash (see Sorenson and Johannessen 2009, Figure 12) dates in China to before AD 900. *D. ebenaster* in India was considered by Balfour (1871-73, I: 23) “a native of China,” but it is actually Mesoamerican in origin (Brücher 1989, 227-28). The term *she* used for it in modern China is unchanged from its Classical Chinese name (Bretschneider 1892, 407), and the species is also grown throughout India (Chopra et al. 1958, 505). These facts suggest an introduction to China at a date of this order. *P. tuberosus* is represented by a sketch in a Chinese volume before AD 1200 (Johannessen and Wang 1998, 26-27), although Chang accepted it as one of the “early” crops of China (1970, 177). Its arrival can hardly be later than episode XVIII.

Episode XIX has no fixed date discernible. Moreover there are a number of “ifs” about the circumstances of the biological exchanges I have supposed were involved at this time. The data indicate that exchanges there indeed were. It is reasonable to combine them as part of a two-or-more-voyage episode.

Artemisia vulgaris (mugwort) was present in China, India and the Mediterranean/Near East and used in a number of ways, as an ingredient in food, medicinally, and in witchcraft. The artemisia plant had many of the same cultural associations in Mexico as in the Mediterranean. It could have been carried to Mesoamerica from any of the three Old World areas. *Chenopodium* (modern preference, *Dysphania*) *ambrosioides* (epazote or “Mexican tea”) was common long ago in Mesopotamia, China and India. It was native to Middle America, yet it had three Sanskrit names in India and was present in early AD centuries in China. These data make it plausible that “Mexican tea” arrived as much as 2,000 years ago in Eurasia. *Solanum nigrum*, black nightshade, while native to Asia, was widely distributed in pre-Columbian America. It must have been involved in a plant exchange perhaps at about the time of episode XIX.

The cotton species *Gossypium gossypioides* has been found only in the state of Oaxaca in southern Mexico. Wendel and associates (1995, 308) assigned it to an African (genetic) clade. How its genes might have reached Oaxaca (only; it has no close relative anywhere else in the New World) is a mystery, unless one supposes a voyage from, say, Egypt as part of episode XIX. A natural drift across the ocean specifically and only to Oaxaca is unbelievable.

Voyaging episode XX is based on the presence of the turkey, *Meleagris gallopavo*, in central Europe and Italy by around 900 AD. Bökönyi and Jánossy (1959) reported that archaeologists have excavated turkey bones in the 14th-century royal castle at Budapest as well as at a site of the same age in Switzerland. Signet rings in Hungary of the 10th-13th centuries show images of turkeys with the fleshy wattle on the fowl’s neck. A letter written in 1490 by Hungarian King Matthias, who died that year, requested that the Duke of

Milan (Italy) furnish him with some turkeys and a caretaker for them. This fowl is, of course, of American origin.

A substantial number of plant exchanges constitutes the basis for supposing episode XXI. *Amaranthus cruentus*, although native to Guatemala, is widely grown in East Asia where it was considered likely pre-Columbian by J. Sauer. Unlike other grain amaranths it is not reported as having either a Chinese or Sanskrit name, so it might have been a relatively late arrival in Asia. *Ageratum conyzoides* (goat weed) had one Sanskrit name and was involved in Ayurvedic medicine. *Couroupita guianensis*, is a tree especially sacred to the Indian god Shiva and is represented in sculptures on at least five temples. The blossoms are considered to represent a lingam before an erect cobra and thus a sign of Shiva. However, the tree was a native of America (where it had no sacred significance), although long grown in India. *Monstera deliciosa*, a parasitic epiphyte from Mexico and Guatemala, is pictured on sculptures from 11th through 13th century temples in India.

Five additional American items of flora bore Sanskrit names, which would not have been the case had they not arrived in India before AD 1000: *Asclepias curassivica* (a weed, false ipecac); *Cyperus vegetus* (edible sedge); *Pachyrhizus erosus* (jicama); *Pennisetum americanum* (pearl millet); and *Salvia coccinea* (the flower scarlet salvia).

It is plausible that this set of plants arrived in India by ship around AD 800, however, it seems unlikely that such a variety of flora would have been gathered and transported on just one vessel; two ships might be a minimum.

Twenty-four species were shared between the mainland and Polynesian islands to the north of Easter Island. The series of voyages to account for that distribution is called episode XXIII. The list is far too large even to summarize at this point; data in evidence can be seen in Chapter 3. The contact points

were Hawaii, presumably from Mesoamerica, and the Marquesas, from Ecuador. In most cases there is little or no information from which to determine a time period for the voyages. It may safely be assumed that they occurred relatively late in pre-Columbian times, after the eastern Polynesian groups had developed populations substantial enough either to impel canoe crews from there to seek lands to the east or to have been able to receive and take advantage of what American rafts brought their way.

The array of cultural elements laid out in Chapter 4, 5, 6, and 7 that were shared between the Old World centers and civilized areas in America bear further witness that major cultural exchanges took place. Their historical implications wait for further chronological information to be brought forward. The material in those four chapters makes unquestionable that major impacts took place on America. It remains to be seen whether cultural exchanges can be detected that went in the other direction. It is tempting to lay out some speculations in that direction, but I prefer to rely on established data rather than interesting conjectures.

With more detailed chronological data our historical narrative could, of course, be spelled out in greater detail. What we have so far is only partial outlines of a history of transoceanic travel that linked major cultures and civilizations. While a substantial number of those voyages over thousands of years is firmly established from the biological data, what we would like to see now is firmer dates for the parallels and the clarification of their origin points and destinations, plus more detailed information on the nautical capabilities of the parties involved and the consequent cultural exchanges.

Chapter 11

The Second Issue. A Model of Communication and Civilization

The old, passé model of how groups of humans became civilized supposed that increments of inventive effort by individuals slowly accumulated until a society passed some threshold that qualified it as “civilized” with few or no contributions from the outside. The processes by which that cumulation might come about were barely explored and never explicated.

Constructing a more accurate model begins at the same point, one innovator at a time. The source of innovation in human activity is indeed the individual human mind. What else would it be? We must assume that each mind has more or less the same inherent capability to innovate as other persons’ minds; at least we do not have any scientific evidence to the contrary. Based on their sheer, innate mental and physical capacity we have no reliable evidence to question that Australian aborigines, for example, individually could have been just as socially and technologically inventive as Amerindians. That would mean that any people is as potentially “civilizable” as Europeans or Chinese, on the basis of their inherent individual capacities.

But no mind exists in isolation. No individual’s thoughts are ever just his own, because humans are necessarily social beings. From our earliest moments following our birth we feel, hear and see stimuli from others, including ideas expressed through language and represented in action. Consider the question, what thoughts have I ever had that have not been based fundamentally on information received from others? The only rational answer is, virtually none. We all constantly live on and amid borrowed intelligence and information.

The innovations that resulted in civilization came from people who dwelt in superior information-borrowing situations. The more densely populated with diverse ideas and information a person's mental ecology is, the more likely is his or her possibility of making a significant innovation to what society will find cumulatively progressive. Thus the possibility of contributing to the evolution of civilization depended more on where a society or innovator was located in terms of access to borrowed ideas than to whom he or she might be in terms of an ethnic label. We are safe in saying that an individual or a group that has access to, say, twice as much knowledge as another group will be considerably more likely to contribute substantively to the potential development of culture/civilization than a less-informed person or group. In a real sense, then, the history of the development of civilized life must begin with the history of communication.

In prehistory, when communication was largely on a local scale, the only significant sociopolitical nexus was likely a band of hunters or gatherers. Communication within that body was oral only, and the accumulation of knowledge was by memory alone. Some ties would have been forged with neighboring groups, especially for procuring mates and the exchange of a few physical resources. Those limiting facts suggest why innovation was so painfully slow in humanity's early stages. But especially after the development of agriculture, villages and sociopolitical formulations that we now call "chiefdoms" and tribes appeared, offering tighter spheres for the exchange of ideas. As communication links increased in density and power, knowledge accessible at a given location necessarily increased.

What we currently call cultures (in political and demographic terms those were embodied as tribes or kingdoms) eventually became effective communication units. By that era of history knowledge that might be shared

had swelled to the point where no single person within a culture could encompass the whole corpus; specialists, often shamans or priests but also craftsmen, controlled particular segments of the totality. With the appearance of writing of course the range of specialized knowledge further increased and could be passed down cumulatively through the generations.

By the third millennium BC in the Near East conquest by a single culture/people of its neighboring peoples resulted in the political structure we call empires. Early empires (e.g., the Egyptian) extended the boundaries of direct communication and shared knowledge across immediate cultural boundaries. Within the communication sphere of an archaic empire cultural sharing was greatly enhanced as the ideas and techniques stemming from a much greater number of inventive individual minds could come to the attention of other culture creators. The sharing of a language or lingua franca facilitated sharing of knowledge. Empires of antiquity often operated within the boundaries of what we call distinct civilizations, yet those civilizations also produced partial cultural blockages at their boundaries (for example, the Persian/Greek barrier) so that in some ways still larger interaction spheres were actually inhibited from forming.

Later empires (e.g., the Roman) became even farther-flung communication spheres, and by that time written messages and books had become vital mechanisms for the communication and accumulation of knowledge, although limited access to them (since written documents existed only in manuscript form), as well as very limited literacy, moderated the influence they had.

By the time of the later empires three levels of communication and sharing of knowledge about local and distant lands had developed. First of course was the commonsense or vernacular level. Potters or weavers, for

instance, generally learned little of what their craft potentially involved beyond what was transmitted to them orally or demonstrated within a rather narrowly drawn circle of their own kind. Farmers too would generally know only of local crop plants and techniques. Of philosophy and esoteric rituals in the hands or minds of the central priests, locals (including local priests) would have been aware only of rudimentary versions of knowledge. Had a local population been transported by ship to a different land, their version of “the culture” would have been quite basic and definitely unrepresentative of what constituted the actual original culture in an expanded, holistic sense.

A second level embraced communication mechanisms wherein a general knowledge of a distant area and a few of the ideas and ways of life common to that area became known, although details were rarely successfully transmitted. In fact, many details would have been selectively disbelieved. An example might be the Fusang tradition in China or the one among the Inca of a raft expedition to Pacific islands.

A third level of communication and accessible knowledge would be represented by the development of traditions of commerce and exploration within which greater penetration of novel cultural ways were possible among those so engaged. Two prime examples of communication along established trade routes were, (1) the Bronze and Iron Age Amber Route that connected the Mediterranean world with sources of amber near the Baltic Sea, and (2) the Silk Road, a multi-route way connecting China and the Mediterranean (Wood 2002). Great volumes of cultural interchange are supposed to have passed along both, nevertheless the process proceeded piecemeal. Effective transfer required hundreds or even thousands of trips that might have gone on over as much as 1,500 years. For instance printing using movable type and the use of paper money were copied in Europe from China, yet thousands of other ideas

did not make that transfer successfully. Cultural movements were of very uneven significance. Even in the 13th century when Marco Polo and his father made their journey to China and, upon their return, described its culture in much detail, a good deal of what they reported was not believed by Europeans or was considered weird or unfeasible to try to borrow. It would have taken communication involving hundreds of travelers to make major inroads in the receiving culture, and even then the consequences might be nearly invisible to historians today because it happened so gradually. (A fascinating case of an alien resident in Roman Italy is reported at

<http://www.sciencedaily.com/releases/2010/02/100201171756.htm>.)

Remains of an East Asian male, identified as such by his DNA, were found in a Roman cemetery. But almost never would such a single visitor have had an enduring cultural impact.)

Yet despite the obstacles to cultural sharing, by AD 1500 a great deal of knowledge was held in common by the civilizations and peoples across Eurasia from the Atlantic to the Pacific as a result mainly of trade relations, military expeditions and conflicts, and social and religious interchanges. Two anthropologists, Kroeber (1952) and Hewes (1961), provided a useful framework for discussing that degree of sharing by referring to the pan-Eurasian cultural sphere as an “oikoumene” (“world”; Hewes preferred the spelling “ecumene”; contrast a distinct usage of the latter term by historian McNeill {1963}).

Kroeber defined the oikoumene by listing over a hundred culture traits that were shared essentially throughout it. Hewes expanded the list. They both maintained that, in Kroeber’s words (1952, 391), the situation “leaves little moral doubt of there having been a connection of some sort” throughout the

vast area. The linkages, Kroeber thought, might be due either to “conscious and specific imitation of something foreign” or else to “an ideational germ which was transported [from place to place] and which slumbered, perhaps for centuries, until its environment awoke it.”

Kroeber (page 393) saw the cultures of marginal areas as products of a lesser degree of communication. “Primitives”--enclaves inside the oikoumene or exclaves that adjoined it--“derive[d] their cultures mainly from the civilization characteristic of the Oikoumene through reductive selection. They preserve[d] old elements largely discarded elsewhere, and they [did] without elements which their retardation [made] them unable or unwilling to accept. Basically, however, these retarded or primitive cultures in or adjacent to the Oikoumene are fully intelligible only in terms of ‘Oikoumenical’ civilization.”

By the same reasoning Kroeber and Hewes employed, the area called by Americanist anthropologists and archaeologists Nuclear America (Mesoamerica and the Andean area considered as one unit) can be construed as something of its own New World oikoumene.

Yet, indeed, it appears to be related to the grand Eurasian one. In 1971 I calculated that one in eight of Hewe’s expanded list of ecumenical culture traits in the Old World were also found in Mesoamerica. That seemed too high a proportion to be due to coincidence. Since then the number of matches has increased modestly. Language I used about this situation 40 years ago remains accurate now: “It is plausible, and perhaps necessary, to interpret the rise of civilization in Mesoamerica as significantly dependent upon communication from . . . Eurasia” (Sorenson 1971, 226). In other words, New World civilization is “fully intelligible only in terms of ‘Oikoumenical’ civilization,” to use Kroeber’s words.

The relationship between Nuclear America and the Old World oikoumene falls somewhere between full participation and that governing communication to Kroeber's "primitive" societies. Especially when one puts together the different influences that came from the three centers of Old World civilization, India, China, and the Mediterranean/Near East, it is clear that Mesoamerica and Peru would not have developed in the way they did, nor to the same degree, had major contacts with Eurasia not occurred. The connection between Polynesia and the Americas is different, however. The influences in that case were predominantly to the island sphere, not in the reverse direction.

A substantial proportion of the imports of biology and culture from the civilized Old World to Mesoamerica and Peru that we have discussed in this book must have arrived early, in the Formative era, for those features became widespread internally as well as being manifest at early points in the cultural sequence. I see the additions to American civilization from Eurasia as the equivalents of both seeds and transplants in the biological sphere. Once introduced to the American scene(s) their growth and development responded, if at all, to local conditions. That gives the appearance that many of them sprang up "independently." But given the evident facts of transoceanic voyaging it is clear that that degree of independence was limited. Absent the "seeds/transplants" from the Old World, it is unlikely that any American civilization would have developed to the level and in the manner that it did.

Lubensky (1991) contributed a helpful concept to clarify this pattern of arrested communication and development. After observing that, "the ability of ancient peoples to . . . pass ideas and technology to others . . . probably has been greatly underrated," as this book has demonstrated, he concluded that diffusion must generally be important in initiating culture change. But its

commonest form, he believed, was a process of “dependent invention” (“modifying and building upon what is learned from others”). This process would capitalize on “seeds,” to use Kroeber’s term, that had reached the New World from Eurasiatic cultures and civilizations. Of course it was not possible that an entire culture could be loaded aboard a ship to be transported wholesale to a new land where the full range of the original patterns would be reproduced entire. But productive ideas brought from overseas could have arrived piecemeal that might evoke different, yet somewhat-the-same, institutions and notions as they became adapted to the new physical and social environments.

The high degree of specificity and range of parallels displayed, especially between the Near East, but with China and India as well, and involving Mesoamerica in particular, argues that a more powerful process was involved in the transfer of biology and culture than would have been possible from only a few ships’ crews cast ashore in the New World. To account for the scope and variety of the transfers we have pointed out, a whole coterie of priests and other cultural specialists seem likely to have been involved in some cases, and their knowledge had to have been passed on systematically to representatives of resident populations and incorporated among them.

This much seems inescapable: on the basis of the biological and cultural connections evident, pre-Columbian American civilization(s) represent cases where partial transmission took place of important features brought from the civilizations of Eurasia. Had the means of transport and communication across the oceans led to more consistent contacts, the American oikoumene might actually have become part of that of the Old World. But it did not. The relationship between the Old World and the New World civilized arenas was not like that of siblings but of cousins.

Links to Old World civilizations—both biological and cultural—are too patent and too fundamental to allow for radically separate, utterly independent development in America. In many ways what evolved here appears to have been the working out of patterns communicated in rudimentary—yet occasionally in developed--form from across the oceans.

Meanwhile judging by the backflow of plants, influences from the American oikoumene on Old World centers in pre-Columbian times were probably of considerable significance in Eurasia. That topic, until now entirely neglected by scholars, invites serious study.

References

- Ackerknecht, Erwin H. 1965. *History and Geography of the Most Important Diseases*. (New York: Hafner).
- Adam, Leonhard. 1931. "Das Problem der asiatisch-altamerikanischen Kulturbeziehungen mit besonderer Berücksichtigung der Kunst," *Wiener Beiträge zur Kunst und Kulturgeschichte Asiens* 5: 40-64.
- Aichel, Otto. 1925. "Österinselpalaeolithen in präistorischen Gräbern Chiles," in *Proceedings of the 21st International Congress of Americanists (Part 2, Gothenburg, Sweden, 1924)*: 267-269.
- Aikens, C. M. 1995. "First in the world: the Jomon pottery of early Japan," in *The Emergence of Pottery: Technology and Innovation in Ancient Societies*, W. K. Barnett and J. W. Hoopes, eds., 11-21. (Washington and London: Smithsonian Institution Press).
- Aiyer, A. K. Yegna Narayan. 1956. *The Antiquity of Some Field and Forest Flora of India*. (Bangalore, India: Bangalore Press).
- Alchon, Suzanne Austin. 1991. *Native Society and Disease in Colonial Ecuador*. (Cambridge, UK: Cambridge University Press).
- Alcina Franch, José. 1958. *Las "pintaderas" mejicanas y sus relaciones*. (Madrid: Consejo Superior de Investigaciones Científicas, Instituto "Gonzalo Fernandez de Oviedo").
- Allison, Marvin J., Daniel Mendoza, and A. Pezzia. 1973. "Documentation of a case of tuberculosis in pre-Columbian America," *American Review of Respiratory Disease* 107: 985-991.

- Allison, Marvin J., E. Gerszten, J. Munizaga, C. Santoroto, and D. Mendoza. 1981. "Tuberculosis in pre-Columbian Andean populations," in *Prehistoric Tuberculosis in the Americas*, J. E. Buikstra, ed., 49-61. (Northwestern University Archaeological Program, Scientific Papers, No. 5).
- Alsar, Vital. 1973. *La Balsa: The Longest Raft Voyage in History*. (New York: Reader's Digest Press/E. P. Dutton).
- Alsar, Vital. 1974. *Pacific Challenge*. An 84-minute video, released by Concord Films (dba ALTI Publishers), La Jolla, CA.
- Alva Ixtlilxochitl, Fernando de. 1952 [ca. 1600]. *Obras Históricas*, A. Chavero, ed. Vol. I: *Relaciones*; Vol. II: *Historia de la nación chichimeca* (México, 1891-1892; reprinted 1952).
- [Anonymous]. 1983. "Blind sailor nears trans-Pacific goal," *Davis (California) Enterprise* (United Press International), Aug. 19, page 5.
- [Anonymous]. 1994. "Prehistory of languages," *Archaeology* 47 (July/August): 17.
- [Anonymous]. 2007. *Unraveling the Mystery: The Hawaii and Tuamotus Connection*. <http://www.bishopmuseum.org/media/2007/pr07093.html>
- Anthony, Irvin. 1930. *Voyagers Unafraid*. (Philadelphia: Macrae Smith).
- Araújo, Aduato. 1988. "Paleoepidemiologia da Ancilostomose," in *Paleoparasitologia no Brasil*, L. Fernando Ferreira, A. Araújo, and U. Confalonieri, eds., 144-151. (Rio de Janeiro: Programa de Educação Pública, Escola Nacional de Saúde Pública).
- Ashraf, Jaweed. 1985. "The antiquity of tobacco (*Nicotiana tabacum*) in India," *Indica* 22: 91-101.
- Badner, Mino. 1966. "The protruding tongue and related motifs in the art style of the American Northwest Coast, New Zealand and China," *Wiener Beitrage zur Kulturgeschichte und Linguistik* 15: 5-44.
- Bailey, Liberty Hyde. 1935. *The Standard Cyclopedia of Horticulture*. 3 Vols. (New York: MacMillan).
- Baity, Elizabeth Chesley 1973. "Archaeoastronomy and ethnoastronomy so far," *Current Anthropology* 14: 389-449.
- Balabanova, Svetlana, Franz Parsche, and Wolfgang Pirsig. 1992. "First report of drugs in Egyptian mummies," *Naturwissenschaften* 79: 358.
- Balfour, Edward G. 1871-1873. *Cyclopedia of India*. 2nd ed. 5 vols. (Calcutta).

- Balser, Carlos. 1968. "Metal and jade in lower Central America," in Proceedings of the 37th International Congress of Americanists (Mar del Plata, Argentina, 1966) 4: 57-63.
- Balser, Carlos. 1988. "Jade de América Central con una posible influencia China," *China Libre (Magazine)* 6 (6): 14-21.
- Bancroft, Hubert Howe. 1875. *The Native Races of the Pacific States*. 5 vols. (London: Longmans, Green). (Reprinted, San Francisco: History Co., 1882).
- Barthel, Thomas S. 1974. "Zur Frage der 'Señores de la Noche,' eine indische Planetenserie in Alt-Mexiko," *Indiana* 2: 47-67. (Berlin).
- Barthel, Thomas S. 1975a. "Weiteres zu den hinduistischen Äquivalenzen im Codex Laud," *Tribus* 24: 113-136.
- Barthel, Thomas S. 1975b. "Weiteres zur Frage der altmexikanischen Nachtherren," *Indiana* 3: 41-66. (Berlin).
- Barthel, Thomas S. 1979. "Enigmatisches in Codex Vaticanus 3773: Kosmogramm und Eschatologie," *Tribus* 28: 83-122.
- Barthel, Thomas S. 1981. "Planetary series in ancient India and prehispanic Mexico: an analysis of their relations with each other," *Tribus* 30: 203-230.
- Barthel, Thomas S. 1982. "Hindu-Maya syncretism: the Palenque focus," *Ibero-Amerikanisches Archiv* 11: 51-63.
- Barton, Humphrey. 1962. *Atlantic Adventures: Voyages in Small Craft*. (New York: Van Nostrand; Southampton, England: Adlard Coles).
- Batres, Leopoldo. 1908. *Civilización Prehistórica de las Riberas del Papaloapam, Costa de Sotavento, Estado de Veracruz*. (México).
- Beals, Ralph L. 1932. *The Comparative Ethnology of Northern Mexico before 1750*. *Ibero-Americana* 2. (Berkeley, CA: University of California).
- Beckwith, M. W. 1932. *Kepelino's Traditions of Hawaii*. B. P. Bishop Museum, Bulletin No. 95. Honolulu.
- Beckwith, M. W. 1940. *Hawaiian Mythology*. (New Haven, CN: Yale University Press).
- Bednarik, Robert J. 1997. "The initial peopling of Wallacea and Sahul," *Anthropos* 92: 355-367.
- Bednarik, Robert J. 2001. "Replicating the first known sea travel by humans: the Lower

Pleistocene crossing of Lombok Strait,” *Human Evolution* 16: 229-242.

Bellwood, Peter S. 1989. “The colonization of the Pacific: some current hypotheses,” in *The Colonization of the Pacific: A Genetic Trail*, A. V. S. Hill and S. W. Serjeantson, eds., 1-59. (Oxford, UK: Clarendon Press).

Bennett, Wendell C. 1947. “The archaeology of the central Andes,” in *Handbook of South American Indians*. Julian H. Steward, ed., 61-147. Bureau of American Ethnology, Bulletin No. 143. (Washington, DC).

Bentley, Jerry H. 2006. “Beyond modernocentrism: toward fresh visions of the global past,” in *Contact and Exchange in the Ancient World*, Victor H. Mair, ed., 17-29. (Honolulu, HI: University of Hawai’i Press).

Berdan, Frances F. 1982. *The Aztecs of Central Mexico. An Imperial Society*. (New York: Holt, Rinehart and Winston).

Bernal, Ignacio. 1969. *The Olmec World*. (Berkeley: University of California Press).

Bhishagratna, K. K., trans. 1907. *The Sushruta Samhita. Vol 3. Chowkhamba Sanskrit Series XXX*. (Varanasi, Indi).

Birket-Smith, Kaj. 1966-1967. “The circumpacific distribution of knot records,” *Folk* 8-9: 15-24. (Copenhagen, Denmark).

Bökönyi, Sándor, and Dénes Jánossy. 1959. “Adatok a pulyka kolumbusz ellötti Európai előfordulás ához,” *Aquila: a Magyar Ornithologiai Központ Folyóirata* 65: 265-269. (Budapest).

Borden, Charles A. 1967. *Sea Quest: Global Blue-Water Adventuring in Small Craft* (Philadelphia, PA: Macrae-Smith).

Borhegyi, Stephan F. de. 1951a. “A study of three-pronged incense burners from Guatemala and adjacent areas,” *Carnegie Institution of Washington, Notes on Middle American Archaeology and Ethnology*, No 101.

Borhegyi, Stephan F. de. 1951b. “Further notes on three-pronged incense burners and rimhead vessels in Guatemala.” *Carnegie Institution of Washington, Notes on Middle American Archaeology and Ethnology*, No. 105.

Borhegyi, Stephan F. de. 1954. ”Jointed figurines in Mesoamerica and their cultural implications,” *Southwestern Journal of Anthropology* 10: 268-277.

Borhegyi, Stephan F. de. 1961. “Miniature mushroom stones from Guatemala,” *American Antiquity* 26: 498-504.

- Borhegyi, Stephan F. de. 1970. "Wheels and man," *Archaeology* 23 (1): 18-21.
- Bosch-Gimpera, Pedro. 1970. "Paralelos transpacíficos de las altas culturas americanas y su cronología," *Anales de antropología* 7: 43-89. (México).
- Bowen, Richard L., Jr. 1953. "Eastern sail affinities, Parts I and II." *American Neptune* 13: 81-117, 185-211,
- Braswell, Geoffrey E. 2001. "Ethnogenesis, social structure, and survival: the Nahuatization of Kichéan culture, 1450-1550," in *Maya Survivalism*, Veli Hostettler and Matthew Restall, eds. (*Acta Mesoamericana*, Vol. 12), 51-58. (Markt Schwaben, Germany: Anton Saurwein).
- Bretschneider, E. 1882. *Botanicum Sinicum. Notes on Chinese Botany from Native and Western Sources.* (London: Trübner).
- Bretschneider, E. 1892. *Botanicum Sinicum. Notes on Chinese Botany from Native and Western Sources, Part II. The Botany of the Chinese Classics, with Annotations, Appendix, and Index by Rev. Ernst Faber.* (Shanghai, China: Kelly & Walsh, Ltd.)
- Bretschneider, E. 1896. "Botanicum Sinicum, Part III. Botanical investigations into the materia medica of the ancient Chinese," *Journal of the Royal Asiatic Society, Chinese Branch* (n.s.) 29: 1-623.
- Brockington, J. L. 1994. "Sanskrit," in *The Encyclopedia of Language and Linguistics*, R. E. Asher, ed., 7: 3649-3651. (Oxford, UK: Pergamon).
- Brown, Forest B. H. 1931. "Flora of southeastern Polynesia. I. Monocotyledons." *Bishop Museum Bulletin* 84. (Honolulu, HI: B. P. Bishop Museum Press).
- Brown, Forest B. H. 1935. "Flora of southeastern Polynesia. III. Dicotyledons." *Bishop Museum Bulletin* 130. (Honolulu, HI: B. P. Bishop Museum Press).
- Bruce, Robert. 1977. "The Popol Vuh and the Book of Chan K'in," *Estudios de Cultura Maya* 10: 173-208.
- Brücher, Heinz. 1989. *Useful Plants of Neotropical Origin and Their Wild Relatives.* (Berlin: Springer-Verlag).
- Buck, Peter H. [Te Rangi Hiroa]. 1938. *Vikings of the Sunrise.* (New York: Frederick A. Stokes).
- Burkill, Isaac H. 1966. *A Dictionary of the Economic Products of the Malay Peninsula.* (Kuala Lumpur, Malaysia: Ministry of Agriculture and Cooperatives).
- Burrows, E. G. 1938. "Western Polynesia, a study in cultural differentiation," *Etnologiska Studier*, No. 7: 1-192. (Stockholm, Sweden).

- Burrows, Thomas. 1955. *The Sanskrit Language*. (London: Faber and Faber).
- Bushnell, G. H. S. 1951. *The Archaeology of the Santa Elena Peninsula in Southwest Ecuador*. (Cambridge, UK: Cambridge University Press).
- Caillot, A. C. E. 1914. *Mythes, legendes et traditions des Polynésiens; texts polynésiennes, recueillis, publiés, traduits en français et commentés*. (Paris: Ernest Leroux).
- Campbell, Joseph. 1989. *Historical Atlas of World Mythology, Vol 2. The Way of the Seeded Earth. Part 3. Mythologies of the Primitive Planters: The Middle and Southern Americas*. (Perennial Library). (New York: Harper and Row).
- Campbell, Lyle, and Terrence Kaufman. 1976. "A linguistic look at the Olmecs," *American Antiquity* 41: 80-89.
- Carlson, John B. 1977. "The case for geomagnetic alignments of precolumbian Mesoamerican sites—the Maya," *Katunob* 10 (2): 67-88. (Greeley, CO).
- Carlson, John B. 1981a. "Olmec concave iron-ore mirrors: the aesthetics of a lithic technology and the lord of the mirror," in *The Olmec and Their Neighbors: Essays in Memory of Matthew W. Stirling*, Elizabeth P. Benson, ed., 117-148. (Washington, DC: Dumbarton Oaks).
- Carlson, John B. 1981b. "A geomantic model for the interpretation of Mesoamerican sites: an essay in cross-cultural comparison," in *Mesoamerican Sites and World Views*, Elizabeth P. Benson, ed., 143-215. (Washington, DC: Dumbarton Oaks).
- Carter, George F. 1971. "Pre-Columbian chickens in America," in *Man across the Sea: Problems of Pre-Columbian Contacts*, Carroll L. Riley et al., eds., 7-22. (Austin, TX: University of Texas Press).
- Carter, George F. 1972. "Musings," *Anthropological Journal of Canada* 10 (2): 25-27.
- Carter, George F. 1974. "Domesticates as artifacts," in *The Human Mirror: Material and Spatial Images of Man*, Miles Richardson, ed., 201-230. (Baton Rouge, LA: Louisiana State University Press).
- Casella, Domenico. 2002a. "The annona and the pineapple depicted at Pompeii," *Pre-Columbiana: A Journal of Long-distance Contacts* 2 (4): 322-323.
- Casella, Domenico. 2002b. "Concerning the depiction of pineapple and *Annona squamosa* in Pompeian paintings," *Pre-Columbiana: A Journal of Long-distance Contacts* 2 (4): 326-333.

- Casella, Domenico. 2002c. "More concerning the depiction of pineapple and *Annona squamosa* in Pompeian paintings," *Pre-Columbiana: A Journal of Long-distance Contacts* 2 (4): 337-341.
- Castello, Salvador. 1924. "The *Gallus inaeureis* and the hen which lays blue eggs," *Second World Poultry Congress (Barcelona)*, 113-118. (Barcelona).
- Chadwick, Robert E. L., Jr. 1974. *The Archaeology of a New World Merchant Culture*. Unpublished Ph.D. dissertation, Tulane University.
- Chang Kwang-chih. 1959. "Chinese prehistory in Pacific perspective: some hypotheses and problems," *Harvard Journal of Asiatic Studies* 22: 100-149.
- Chang Kwang-chih. 1970. "The beginnings of agriculture in the Far East," *Antiquity* 44: 175-185.
- Chang Kwang-chih. 1973. "Radiocarbon dates from China: some initial interpretations," *Current Anthropology* 14: 525-528.
- Chang Kwang-chih. 1989. "The circum-Pacific substratum of ancient Chinese civilization," in *Reprint Proceedings, Circum-Pacific Prehistory Conference, Seattle, August 1-6, 1989, Part IV: Development of Pacific Region Agriculture, Domestication and Emergence of Formative Civilizations, Section B*. (Pullman, WA: Washington State University Press).
- Chen Wenhua. 1994. *Zhongguo nongye kaogu tu lu*. (Nanchang, China: Jiangxi kexue jushu chubanshe).
- Chichester, Francis. 1973. *Along the Clipper Way*. (New York: Ballantine Books).
- Chopra, R. N., S. L. Nayar, and I. C. Chopra. 1956. *Glossary of Indian Medicinal Plants*. (New Delhi, India: Council of Scientific and Industrial Research).
- Chopra, R. N., I. C. Chopra, K. L. Handa, and L.D. Kapur. 1958. *Chopra's Indigenous Drugs of India*. 2nd ed.. (Calcutta and New Delhi, India: Academic Publishers).
- Christian, Frederick William. 1924. "Early Maori migrations as evidenced by physical geography and language," in *Report, Sixteenth Meeting, Australasian Association for the Advancement of Science (Wellington, 1923)*: 523-535. (Wellington, NZ).
- Clark, John E., and David Cheetham. 2002. "Mesoamerica's tribal foundations," in *The Archaeology of Tribal Societies*, W. A. Parkinsons, ed., 278-339. (Archaeological Series 15). (Ann Arbor, MI: International Monographs in Prehistory).
- Coe, Michael D. 1965. "The Olmec style and its distributions," in *Handbook of Middle American Indians, Vol. 3. Archaeology of Southern Mesoamerica, Part 2*. R. Wauchope and G. R. Willey, eds., 739-775. (Austin: University of Texas Press).

Coe, Michael D. 1968. "San Lorenzo and the Olmec Civilization," in *Dumbarton Oaks Conference on the Olmec, October 28th and 29th, 1967*. Elizabeth P. Benson, ed., 41-71. (Washington, D.C.: Dumbarton Oaks).

Coe, Michael D. 1975. "Native astronomy in Mesoamerica," in *Astronomy in Pre-Columbian America*, Anthony F. Aveni, ed., 3-31. (Austin, TX, and London: University of Texas Press).

Coe, Michael D. 1981. "Comment," in *Mesoamerican Sites and World-views*, Elizabeth P. Benson, ed., 214. (Washington, DC: Dumbarton Oaks).

Coedes, G. 1968. *The Indianized States of Southeast Asia*. W. F. Veila, ed. (Canberra: Australia: Australian National University Press).

Compton, Todd. 1997. *Leap into Fire and Rabbit in Moon: Auto-Sacrifice and World Age in Aztec, Indian and Native American Myth*. Unpublished paper, copy in possession of John Sorenson.

Cook, Orator F. 1904. "Food plants of ancient America," *Annual Report of the Board of Regents of the Smithsonian Institution . . . [for 1903]*. (Washington, DC).

Covarrubias, Miguel. 1957. *Indian Art of Mexico and Central America*. (New York: A. A. Knopf).

Crawford, Michael H. 1998. *The Origins of Native Americans: Evidence from Anthropological Genetics*. (Cambridge, UK: Cambridge University Press).

Crawley, E. 1951. "Human sacrifice (introductory and primitive)," in *Encyclopedia of Religion and Ethics*, James Hastings, ed., VI: 1024. (New York: Scribner's).

Cronau, Rudolf. 1892. *Amerika: Die Geschichte seiner Entdeckung von der ältesten bis auf die neueste Zeit.* (Leipzig, Germany: Abel und Müller).

Cronk, Lynn Ellen. 1973. *Mesoamerican and Indian Fire Gods and Ceremonies*. Unpublished M. A. thesis. University of Calgary (Canada).

Culin, Robert Stewart. 1903. "America the cradle of Asia," *Harper's Monthly Magazine* 106: 534-540.

Cunningham, Alexander. 1879. *The Stupa of Bharhut: A Buddhist Monument Ornamented with Numerous Sculptures Illustrat[ive] of Buddhist Legend and History in the Third Century B.C.* (London; reprinted, Varanasi, India: Indological Book House, 1962).

Davies, Arthur. 1984. "Prince Madoc and the discovery of America in 1477," *Geographical Journal* 150: 363-372.

Davis, Horace C. 1872. "Japanese wrecks in American waters," *Overland Monthly* 9: 353-360.

Day, John. 1992. "Leviathan," in *Anchor Bible Dictionary*, David N. Freedman, ed., 4: 295-296. (New York: Doubleday).

Degener, O. 1930. *Ferns and Flowering Plants of Hawaii National Park*. (Honolulu, HI).

(:)

Denison, Thomas Stewart. 1908. *The Primitive Aryans of America: Origin of the Aztecs and Kindred Tribes, Showing Their Relationship to the Indo-Iranians and the Place of the Nauatl [sic] or Mexican in the Aryan Group of Languages*. (Chicago, IL: T. S. Denison).

Denison, Thomas Stewart. 1913. *Mexican Linguistics: Including Nauatl [sic] or Mexican in Aryan Phonology; The Primitive Aryan of America; A Mexican-Aryan Comparative Vocabulary; Morphology and the Mexican Verb, and The Mexican-Aryan Sibilants; with an Appendix on Comparative Syntax*. (Chicago, IL: T. S. Denison).

Dickinson, William R., Y. H. Sinoto, R. Shutler, Jr., M. E. Shutler, J. Garanger, and T. M. Teska. 1999. "Japanese Jomon sherds in artifact collections from Mele plain on Efate in Vanuatu," *Archaeology in Oceania* 34:15-24.

Dillehay, Tom D. 2000. *The Settlement of the Americas: A New Prehistory*. (New York: Basic Books).

Dixon, E. James. 1993. *Quest for the Origins of the First Americans*. (Albuquerque, NM: University of New Mexico Press).

Dixon, E. James. 1999. *Bones, Boats, and Bison: Archeology and the First Colonization of Western North America*. (Albuquerque: University of New Mexico Press).

DNA Consultants. 2010. "Cherokee DNA project,"
<http://dnaconsultants.com/Cherokee/index.htm>

Donkin, R. A. 1979. "Agricultural terracing in the aboriginal New World," *Viking Fund Publications in Anthropology* 56. (Published for the Wenner-Gren Foundation by the University of Arizona Press, Tucson, AZ).

Doran, Edwin, Jr. 1971. "The sailing raft as a great tradition," in *Man across the Sea: Problems of Pre-Columbian Contacts*, Carroll L. Riley et al., eds., 115-138. (Austin, TX: University of Texas Press).

Doran, Edwin, Jr. 1978. "Seaworthiness of sailing rafts." *Anthropological Journal of Canada* 16: 17-22.

- Drögmüller, Cord, et al. 2008. "A mutation in hairless dogs implicates FOX 13 in ectodermal development," *Science* 321 (5895): 1426.
- Drucker, Philip. 1981. "On the nature of the Olmec polity," in *The Olmec and their Neighbors: Essays in Memory of Matthew W. Stirling*. Elizabeth P. Benson, ed., 29-47, (Washington, DC: Dumbarton Oaks).
- DuBois, Constance Goddard. 1908. *The Religion of the Luiseño Indians of Southern California*. University of California Publications in American Archaeology and Ethnology 8 (3): 69-186.
- Dumont, Henri J., Christine Cocquyt, Michel Fontugne, Maurice Arnold, Jean-Louis Reyss, Jan Bloemendal, Frank Oldfield, Cees L. M. Steenbergen, Henk J. Korthals, and Barbara A Zeeb. 1998. "The end of *moai* quarrying and its effect on Lake Rano Raraku, Easter Island," *Journal of Paleolimnology* 20: 409-422.
- Durbin, Marshall. 1971. "The evolution and diffusion of writing," *American Anthropologist* 73 (2): 299-304.
- Easton, N. Alexander. 1992. "Mal de mer above terra incognita, or what ails the coastal migration theory?" *Arctic Anthropology* 29 (2): 28-41.
- Edwards, Clinton R. 1965. *Aboriginal Watercraft on the Pacific Coast of South America*. (Berkeley: University of California Press).
- Edwards, Clinton R. 1972. "New World perspectives on pre-European voyaging in the Pacific," in *Early Chinese Art and Its Possible Influence in the Pacific Basin*. Vol. 3. Noel Barnard, ed., 843-887. (New York: Intercultural Arts Press).
- Ekholm, Gordon F. 1964a. *A Maya Sculpture in Wood*. (New York: Museum of Primitive Art).
- Ekholm, Gordon F. 1964b. "The possible Chinese origin of Teotihuacan cylindrical tripod pottery and certain related traits," *Proceedings of the 35th International Congress of Americanists (Mexico, 1962)*: 39-45.
- Ekholm, Gordon F. 1973. "The archaeological significance of mirrors in the New World," *Proceedings of the 40th International Congress of Americanists (Rome and Genoa, 1972)*, 1: 133-135. (Rome).
- Elkin, Adolphus P., and N.W. G. MacIntosh, eds. 1974. *Grafton Elliot Smith: The Man and his Work*. (Sydney, Australia: Sydney University Press).
- Ellis, W. 1831. *Polynesian Researches during a Residence of Nearly Eight Years in the Society and Sandwich Islands*. 4 vols. (London).

Emerson, N. B. 1909. "Unwritten literature of Hawaii." Bureau of American Ethnology, Bulletin No. 30. (Washington, DC).

Emory, Kenneth P. 1933. "Stone remains in the Society Islands," Bernice P. Bishop Museum, Bulletin No. 116. (Honolulu, HI).

Emory, Kenneth P. 1942. "Oceanian influence on American Indian culture: Nordenskiöld's view," *Journal of the Polynesian Society* 51: 126-135.

Emory, Kenneth P. 1963. "Review of Archaeology of Easter Island, by Thor Heyerdahl and Edwin N. Ferdon, Jr.," *American Antiquity* 28: 565-567.

Erlandson, Jon M. 2002. "Anatomically modern humans, maritime voyaging, and the Pleistocene colonization of the Americas," in *The First Americans*, Mina G. Jablonski, ed., 59-92 (Memoirs of the California Academy of Science, No. 27). (San Francisco, CA).

Erlandson, Jon M., Michael H. Graham, Bruce J. Bourque, Debra Corbett, James A. Estes, and Robert S. Steneck. 2007. "The kelp highway hypothesis: marine ecology, the coastal migration theory, and the peopling of the Americas." *Journal of Island and Coastal Archaeology* 2: 161-174.

Errázuriz, Jaime. 1980. *Tumaco-La Tolita: una cultura precolombina desconocida*. (Bogotá, Colombia: C. Valencia Editores).

Estrada, Emilio, and Betty J. Meggeers. 1961. "A complex of traits of probable transpacific origin on the coast of Ecuador," *American Anthropologist* 63: 913-939.

Fauria, Carmen. 1986. "El grupo Tumaco-Tolita a través de la colección de Torredembarra," *Boletín Americanista* 35: 91-114. (Barcelona.)

Fenyvesi, Charles. 1996. "A tale of two cultures," *U.S. News & World Report* (December 4): 46-48.

Ferdon, Edwin N. 1961. "Easter Island house types," *El Palacio* 68: 28-46. (Santa Fé, NM).

Ferreira, Luiz Fernando, Adauto Araújo, and Ulisses Eugenio Confalonieri. 1982. "Os parasitos do homem antigo," *Ciência Hoje* 1 (3, Nov.-Dez.): 63-67.

Ferreira, Luiz Fernando, Adauto Araújo, Ulisses Eugenio Confalonieri, M. Chame, and B. Ribeiro Filho. 1988. "Encontro de ovos de ancilostomídeos em coprólitos humanos datados de 7,230±80 B. P. no estado de Piauí, Brasil," in *Paleoparasitologia no Brasil*, L. Fernando Ferreira, A. Araújo, and U. Confalonieri, eds., 37-40. (Rio de Janeiro, Brazil: Programa de Educação Pública, Escola Nacional de Saúde Pública).

Fladmark, K. R. 1979. "Routes: alternate migration corridors for early man in North

America,” *American Antiquity* 44: 55-69.

Fladmark, K. R. 1983. “Times and places: environmental correlates of Mid-to-Late Wisconsin human population expansion in North America,” in *Early Man in the New World*, Richard Shutler, ed., 13-42. (Beverly Hills, CA: Sage Publications).

Fladmark, K. R. 1986. “Getting one’s Berings,” *Natural History* 95: 8-19.

Fonseca, Olympio da. 1970. *Parasitismo e migrações da parasitologia para o conhecimento das origens do homem Americano. (Estudos de Pré-história Geral e Brasileira)*. (Sao Paulo, Brazil: Instituto de Pré-história de Universidade de São Paulo).

Ford, James A. 1965. “Review of *Prehistoric Man in the New World*, ed. J. Jennings and E. Norbeck,” *American Anthropologist* 67: 157-9.

Ford, James A., 1967. “Review of *Early Formative Period of Coastal Ecuador*, by B. Meggers, C. Evans, and E. Estrada,” *American Antiquity* 32: 258-9.

Foster, Mary LeCron. 1992a. “Old World Language in the Americas, 1.” Unpublished paper presented at the annual meeting of the Association of American Geographers, San Diego, CA. Copy in possession of John Sorenson.

Foster, Mary LeCron. 1992b. “Old World Language in the Americas, 2.” Unpublished paper presented at the annual meeting of the Language Origins Society, Cambridge University, Cambridge, England. Copy in possession of John Sorenson.

Frankfort, Henry. 1935. *Oriental Institute Discoveries in Iraq, 1933/34. Fourth Preliminary Report of the Iraq Expedition*. (University of Chicago, Oriental Institute Communications, No. 19).

Freddolino, Marie Kimball. 1973. *An Investigation into the “Pre-Tarascan” Cultures of Zacapu, Michoacán, Mexico*. Unpublished Ph.D. dissertation, Yale University.

Fuchs, Stephan. 1951. “Ancient cultural links between America, Asia and Oceania,” *Journal of the Anthropological Society of Bombay* 5: 51-75.

Fulop, Marcos. 1954. “Aspectos de la cultura Tukana: cosmología,” *Revista colombiana de antropología* 3: 97-137.

Furst, Peter T. 1965. “West Mexican tomb sculpture as evidence for shamanism in prehispanic Mesoamerica,” *Antropológica* 15: 29-80. (Caracas, Venezuela).

Furst, Peter T. 1978. “The ninth level: funerary art from ancient Mesoamerica,” in *Selections from the Gerald and Hope Solomons Collection*, 11-39. (Iowa City, Iowa: University of Iowa Museum of Art).

Gamble, Clive. 1993. *Timewalkers: The Prehistory of Global Colonization*. (Phoenix Mill, UK: Alan Sutton, and Cambridge, MA: Harvard University Press).

García-Payón, José. 1961. "Una cabecita de barro de extraña fisonomía," *Boletín, Instituto Nacional de Antropología e Historia* 6 (Oct.): 1-2. (México).

Gardiner, Alan. 1950. "The baptism of Pharaoh," *Journal of Egyptian Archaeology* 36: 3-12.

Garibay Kordell, Ángel María. 1959a. "Semejanza de algunos conceptos filosóficos de las culturas Hindú y Náhuatl," *Cuadernos Americanos* 18 (2): 119-144.

Garibay Kordell, Ángel María. 1959b. "Review of *Las pintaderas mejicanas y sus relaciones* by Alcina Franch," *América Indígena* 19: 237-239.

Gartlemann, Karl Dieter. 1986. *Digging up Prehistory: The Archaeology of Ecuador*. (Quito, Ecuador: Ediciones Libri Mundi).

Giesing, Kornelia B. 1984. *Rudra-Siva und Tezcatlipoca: ein Beitrag zur Indo-Mexikanistik*. (Tübingen, Germany: Verlag Science und Fiction, Reihe {Ethnologische Studien 1}).

Gingerich, Owen. 1980. "Foreword," in *Skywatchers of Ancient Mexico*, by Anthony F. Aveni, p. x. (Austin, TX, and London: University of Texas Press).

Glassner, Jean-Jacques. 1995. "The use of knowledge in ancient Mesopotamia," in *Civilizations of the Ancient Near East*, Jack M. Sasson et al, eds., 3: 1815-1823. (New York: Charles Scribner's Sons, Macmillan Library Reference USA, and Simon and Schuster Macmillan).

Glover, Ian C. 1977. "The Late Stone Age in eastern Indonesia," *World Archaeology* 9 (June): 42-61.

Goetz, Delia, and S. G. Morley, trans. from the Spanish of Adrián Recinos. 1950. *Popol Vuh. The Sacred Book of the Ancient Quiché Maya*. (Norman: University of Oklahoma Press).

Golzio, Karl-Heinz. 1985. "Review of *Rudra-Siva und Tezcatlipoca, ein Beitrag zur Indo-Mexikanistik*, by Kornelia B. Giesing," *Review of German Research* 21 (2): 148-152.

Gonzalez Calderón, O. Luis. 1991. *Cabecitas Olmecas: orígenes de la primera civilización de América*. (Coatzacoalcos, Veracruz, Mexico: Privately printed).

Gordon, Cyrus Herzl. 1971. *Before Columbus: Links between the Old World and Ancient America*. (New York: Crown).

Gordon, Cyrus Herzl. 1993. "Hebrew presence in pre-Columbian America," NEARA Journal 28 (3-4): 91-96. (New England Antiquities Research Association)

Graham, John A. 1971. Comments on a paper, "Calendrics and writing," by Hanns J. Prem, in Observations on the Emergence of Civilization in Mesoamerica, R. F. Heizer and John A. Graham, eds, 133-140. (Contribution 11). (Berkeley, CA: University of California Archaeological Research Facility).

Graulich, Michel. 1983. "Myths of paradise lost in pre-Hispanic Central Mexico," Current Anthropology 24 (5): 575-588.

Greenway, John. 1977. "An introduction to an age of conquest," in Fernando Cortés, his Five Letters of Relation to the Emperor Charles V, trans. and ed. by F. A. MacNutt, 1908. (Reprinted with new front matter by John Greenway. Glorieta, NM: Rio Grande Press).

Greenberg, Joseph H., C. G. Turner II, and Stephen Zegura. 1986. "The settlement of the Americas: a comparison of the linguistic, dental, and genetic evidence," Current Anthropology 27: 477-497.

Gruhn, Ruth. 1998. "Linguistic evidence in support of the coastal route of earliest entry into the New World," Man 23: 77-100.

Gunther, Robert T., ed. 1934. The Greek Herbal of Dioscorides. (Oxford, UK: Oxford University Press).

Gupta, Shakti M. 1996. Plants in Indian Temple Art. (Delhi, India: B. R. Publishing).

Handy, Edward Smith Craighill, III. 1930. "Marquesan legends," Bernice P. Bishop Museum Bulletin 69. (Honolulu, HI).

Handy, Edward Smith Craighill, III. 1936. "Dreaming in relation to spirit kindred and sickness in Hawaii," in Essays in Anthropology Presented to A. L. Kroeber, 119-127. (Berkeley, CA: University of California Press).

Handy, Lowell K. 1992a. "Serpent (religious symbolism)," in Anchor Bible Dictionary, David N. Freedman, ed., 5: 1113-1116. (New York: Doubleday).

Handy, Lowell K. 1992b. "Serpent, bronze," in Anchor Bible Dictionary, David N. Freedman, ed., 5: 1117. (New York: Doubleday).

Hartman, Orar M. 1973. The Origin and Dispersal of the Domestic Fowl: A Study in Cultural Diffusion. Unpublished M.A. thesis, University of Oregon.

Hather, J., and P.V. Kirch. 1991. "Prehistoric sweet potato (*Ipomoea batatas*) from Mangaia Island, central Polynesia," Antiquity 65: 887-893.

- Heine-Geldern, Robert von. 1964. "Traces of Indian and southeast Asiatic Hindu-Buddhist influences in Mesoamerica," *Proceedings of the 35th International Congress of Americanists (Mexico, 1962)* 1: 47-54. (México).
- Heine-Geldern, Robert von. 1967. "A Roman find from pre-Columbian Mexico," *Anthropological Journal of Canada* 5 (4): 20-22.
- Heine-Geldern, Robert von, and Gordon F. Ekholm. 1951. "Significant parallels in the symbolic arts of southern Asia and Middle America," in *The Civilizations of Ancient America; Selected Papers of the 29th International Congress of Americanists (New York, 1949)*, Sol Tax, ed., 299-309. (Chicago, IL: University of Chicago Press).
- Heiser, Charles B., Jr. 1985. *Of Plants and People*. (Norman, OK: University of Oklahoma Press).
- Heizer, Robert F. 1949. "Curved single-piece fishhooks of shell and bone in California," *American Antiquity* 15: 89-97.
- Hellmuth, Nicholas M. 1987. *Monster und Menschen in der Maya-Kunst. Eine Ikonographie der alten Religionen Mexikos und Guatemalas*. (Graz, Austria: Akademische Druck- und Verlagsanstalt).
- Helms, Mary W. 1988. *Ulysses' Sail: An Ethnographic Odyssey of Power, Knowledge, and Geographical Distance*. (Princeton, NJ: Princeton University Press).
- Henning, Paul. 1911. "Apuntes sobre la historia del chalchihuitl en América," *Memoria de la Sociedad "Antonio Alzate"* 31: 29-46.
- Hentze, Carl. 1951. *Bronzegeräte, Kultbauten, Religion im ältesten China der Shang-Zeit*. (Antwerp, Belgium: Ediciones de Sikkell).
- Hewes, Gordon W. 1961. "The ecumene as a civilizational multiplier system," *Kroeber Anthropological Society Papers* 25: 73-109. (Berkeley, CA).
- Heyden, Doris. 1981. "Caves, gods, and myths: world-view and planning in Teotihuacan," in *Mesoamerican Sites and World-Views*, Elizabeth P. Benson, ed., 1-35. (Washington, DC: Dumbarton Oaks).
- Heyerdahl, Thor. 1950. *Kon-Tiki: Across the Pacific by Raft*. (New York: Rand McNally).
- Heyerdahl, Thor. 1952. *American Indians in the Pacific: The Theory behind the Kon-Tiki Expedition*. (London: George Allen and Unwin).
- Heyerdahl, Thor. 1959. "Guara sailing technique indigenous to South America," *Proceedings of the 33rd International Congress of Americanists (San José, Costa Rica, 1958)*, 1: 333-340.

Heyerdahl, Thor. 1964. "Plant evidence for contacts with America before Columbus," *Antiquity* 38/15: 120-133.

Heyerdahl, Thor. 1968. "The prehistoric culture of Easter Island," in *Prehistoric Culture in Oceania: A Symposium*, I. Yawata and Y. G. Sinoto, eds, 133-140. Eleventh Pacific Science Congress, Tokyo, 1967. (Honolulu, HI: Bishop Museum Press).

Heyerdahl, Thor. 1969. "Archaeology in the Galapagos Islands," *Galapagos Islands: A Unique Area for Scientific Investigations; A Symposium Presented at the Tenth Pacific Science Congress* (Honolulu, 1961). *Occasional Papers of the California Academy of Sciences* 44: 45-51.

Heyerdahl, Thor. 1996. *Green Was the Earth on the Seventh Day*. (New York: Random House).

Heyerdahl, Thor, Daniel H. Sandweiss, and Alfredo Narváez. 1995. *Pyramids of Túcume: The Quest for Peru's Forgotten City*. (New York: Thames and Hudson).

Hildebrand, W. H., J. Zémour, R. C. Williams, R. Lux, M. S. Petzi Erier, and P. Parham. 1992. "Unusual HLA-B alleles in two tribes of Brazilian Indians," *Nature* 357: 326-328.

Hillebrand, W. 1888. *Flora of the Hawaiian Islands*. (Heidelberg, Germany).

Howey, M. Oldfield. 1926. *The Encircled Serpent: A Study of Serpent Symbolism in All Countries and Ages*. (Philadelphia, PA: David McKay, and London: Rider).

Hristov, Romeo, and Santiago Genovés T. 1999. "Mesoamerican evidence of pre-Columbian transoceanic contacts," *Ancient Mesoamerica* 10: 207-213.

Ihle, A. 1939. "Ponchoartige Gewänder in der südostasiatischen und oceanischen Inselwelt," *Abhandlungen der Gesellschaft der Wissenschaft zu Göttingen*, Band 24, Heft 3. (Berlin: Weidmann).

Imbelloni, José. 1930. "On the diffusion in America of onewa, okewa, paraoa, miti and other relatives of the 'mere' family," *Journal of the Polynesian Society* 39: 322-345.

Imbelloni, José. 1934. "Der Zauber 'toki.' Die Zuberformel des Maori-Zimmermannes beim Fällen eines Baumes, die wörtlich in der chilenischen Erzählung vom alten Tatrapiarhalten ist," *Proceedings of the 24th International Congress of Americanists* (Hamburg, 1930): 228-242.

Ingstad, Helge Marcus, and Anne Stine Ingstad. 1985. *The Discovery of America*. 2 vols. (Oslo, Norway: Universitetsforlaget).

- International Library Association, comp. and ed. 1996. *Medicinal Plants Sourcebook India: A Guide to Institutions, Publications, Information Services and Other Resources*. (Switzerland: International Library Association; and Dehra Dun, India: Nahraj Publishers.)
- Jairazbhoy, Rafique Ali. 1974. "Ancient Egyptians and Chinese in America. (Totowa, NJ: Rowman and Littlefield, and London: George Prior).
- James, E. O. 1966. *The Tree of Life*. (Leiden, The Netherlands: Brill).
- Jeffreys, M. D. W. 1963. "How ancient is West African maize?," *Africa* 33: 115-131.
- Jennings, Jesse D. 1968. *Prehistory of North America*. (New York: McGraw-Hill).
- Jett, Stephen C. 2002a. "Nicotine and cocaine in Egyptian mummies and THC in Peruvian mummies; a review of the evidence and of scholarly reaction," *Pre-Columbiana: A Journal of Long-distance Contacts* 2 (4): 297-313.
- Jett, Stephen C. 2002b. "Archaeological hints of pre-Columbian plantains in the Americas," *Pre-Columbiana: A Journal of Long-distance Contacts* 2 (4): 314-316.
- Jett, Stephen C. 2002c. "Postscript on pineapple and annona," *Pre-Columbiana: A Journal of Long-distance Contacts* 2 (4): 342-343.
- Johannessen, Carl L., Wayne Fogg, and May Chen Fogg. 1984. "Distributional and medicinal use of the black-boned and black-meated chicken in Mexico, Guatemala, and South America," *National Geographic Society Research Reports* 17: 493-495.
- Johannessen, Carl L., and Ann Z. Parker. 1989. "American crop plants in Asia prior to European contact," *Year Book 1988. Proceedings of the Conference of Latin Americanist Geographers* 14, 14-19.
- Johannessen, Carl L., and Wang Siming. 1998. "American crop plants in Asia before A.D. 1500," *Pre-Columbiana. A Journal of Long-Distance Contacts* 1 (1-2): 9-36.
- Jones, Terry L., and Kathryn A. Klar. 2005. "Diffusionism reconsidered: linguistic and archaeological evidence for prehistoric Polynesian contact with Southern California," *American Antiquity* 70 (3): 457-484.
- Juarros, Domingo. 1971 [1823]. *A Statistical and Commercial History of the Kingdom of Guatemala*. (London: John Hearn; reprint, New York: AMS Press, 1971).
- Kearsley, Graeme R. 2002. *Pacal's Portal to Paradise at Palenque: The Iconography of India at Palenque and Copan*. (London: Yelsraek).
- Keel, Othmar. 1978. *The Symbolism of the Biblical World; Ancient Near Eastern Iconography and the Book of Psalms*. (New York: Seabury Press).

- Kehoe, Alice B. 1998. *The Land of Prehistory: A Cultural History of American Archaeology*. (New York: Routledge).
- Kelley, David H. 1957. *Our Elder Brother Coyote: Evidence for a Mexican Element in the Formation of Polynesian Culture*. Unpublished Ph.D. dissertation, Harvard University.
- Kelley, David H. 1960. "Calendar animals and deities," *Southwestern Journal of Anthropology* 16: 317-337.
- Kelley, David H. 1964a. "Linguistics and problems in trans-Pacific contacts," *Proceedings of the 35th International Congress of Americanists (Mexico, 1962)* 1: 17-18.
- Kelley, David H. 1964b. "Knife-wing and other man-eating birds," *Proceedings of the 35th International Congress of Americanists (Mexico, 1962)* 1: 589-590.
- Kelley, David H. 1966. "A cylinder seal from Tlatilco," *American Antiquity* 31: 744-746.
- Kelley, David H. 1972. "The nine lords of the night," in *Studies in the Archaeology of Mexico and Guatemala*, John A. Graham, ed., 53-68. (Contribution 16). (Berkeley, CA: University of California Archaeological Research Facility).
- Kelley, David H. 1974. "Eurasian evidence and the Maya calendar correlation problem," in *Mesoamerican Archaeology: New Approaches*, Norman Hammond, ed., 135-143. (Austin, TX: University of Texas Press).
- Kelley, David H. 1975. "The world ages in India and Mesoamerica," *Newsletter and Proceedings, Society for Early Historic Archaeology*, No. 137. (Provo, UT).
- Kelley, David H. 1990. "Tane and Sina: a Uto-Aztecan astronomical cult in Polynesia," in *Circumpacifica. Band I: Ozeanien Miscellen. Festschrift für Thomas S. Barthel, Bruno Illius and Mathias Laubscher*, eds., 137-156. (Frankfurt, Germany: Peter Lang).
- Kelley, David H. 1998. "**Wangkang, *kumadjang, and *Longo*," *Pre-Colombiana: A Journal of Long-distance Contacts* 1 (1/2): 72-77.
- Key, Mary Ritchie. 1984. "Polynesian and American linguistic connections." *Edward Sapir Monographic Series in Language, Culture and Cognition* 12. (Lake Bluff, IL: Jupiter Press).
- Kiang Kang-Hu [Chiang Khang-Hu]. 1933. "Resemblances seen between the Maya civilization and that of the Chinese," *Transactions of the Royal Society of Canada* 2 (27): 75-85.
- Kidder, Alfred V., Jesse D. Jennings and Edwin Shook. 1946. *Excavations at Kaminaljuyu, Guatemala*. (Carnegie Institution of Washington, Publication 561).

Kidder, Alfred, II. "South American high cultures," in *Prehistoric Man in the New World*, J. D. Jennings and E. Norbeck, eds., 451-86. (Chicago: University of Chicago Press).

King, Mary Elizabeth. 1979. "The prehistoric textile industry of Mesoamerica," in *The Junius B. Bird Pre-Columbian Textile Conference, May 19th and 20th, 1973*, Ann Pollard Rowe, Elizabeth P. Benson, and Anne-Louise Schaffer, eds., 265-278. (Washington, DC: The Textile Museum and Dumbarton Oaks).

Kirchhoff, Paul. 1964a. "The adaptation of foreign religious influences in pre-Spanish Mexico," *Diogenes* 47: 13-28.

Kirchhoff, Paul. 1964b. "The diffusion of a great religious system from India to Mexico," *Proceedings of the 35th International Congress of Americanists (Mexico, 1962)* 1: 73-100.

Kirtikar, K. R., and B. D. Basu. 1935. *Indian Medicinal Plants*. Second ed. (Dehradun, India: International Books Distributors, 1987).

Knoche, W. 1925. *Die Osterinel: eine Zusammenfassung der chilenischen Osterinseln Expedition des Jahres 1911*. (Concepción, Chile: Verlag des Wissenschaftlichen Archives von Chile).

Kosakowsky, Laura J., F. Estrada Belli, and P. Pettitt. 2000. "Preclassic through Postclassic: ceramics and chronology of the southeastern Pacific Coast of Guatemala," *Ancient Mesoamerica* 11: 199-215.

Krapovickas, A. 1969. "The origin, variability, and spread of groundnut (*Arachis hypogaea*)," in *The Domestication and Exploitation of Plants and Animals*. Peter J. Ucko and C. W. Dingleby, eds., 427-441. (London: Duckworth; and Chicago/New York: Aldine-Atherton).

Kroeber, Alfred L. 1928. *Native Culture of the Southwest*. University of California Publications in American Archaeology and Ethnology 23 (9): 375-398.

Kroeber, Alfred L. 1940. "Stimulus diffusion," *American Anthropologist* 42: 1-20.

Kroeber, Alfred L. 1952. *The Nature of Culture*. (Chicago: University of Chicago Press).

Kuhn, Thomas. 1962. *The Structure of Scientific Revolutions*. (Chicago: University of Chicago Press).

Lancaster, S. P. 1965. *The Sacred Plants of the Hindus*. Bulletin of the National Botanical Garden, No. 113. (Lucknow, India).

Langdon, Robert. 1982. "New World cotton as a clue to the Polynesian past." *Oceanic Studies: Essays in Honour of Aarne A. Koskinen, Jukka Sūkala*, ed. Finnish Anthropological Society Transactions No. 11. Helsinki. 179-92.

Langdon, Robert. 1988. "Manioc, a long concealed key to the enigma of Easter Island," *The Geographical Journal* 154: 324-336.

Langdon, Robert, and D. Tryon. 1983. *The Language of Easter Island: Its Development and Eastern Polynesian Relationships*. (Laie, HI: Brigham Young University – Hawaii Campus, Institute for Polynesian Studies).

Latcham, Ricardo E. 1922. "Los animals domésticos de la América pre-Colombiana," *Museo de Etnología e Antropología, Publicación* 3 (1): 1-199.

Layard, Austen H. 1849. *Nineveh and Its Remains*. (London).

Lehmann-Nitsche, Robert. 1909-1910. "Clavas cefalomorfas de piedra procedentes de Chile y Argentina," *Revista del Museo de La Plata* 16: 150-170. (Buenos Aires).

Leland, Charles Godfrey. 1875. *Fusang, or the Discovery of America by Chinese Buddhist Priests in the Fifth Century*. (New York: J. S. Bouton).

León, Fidias E., Amparo A. de León, and Adriana Ariza. 1994. "El viaje transpacífico del virus de la leucemia de células T del adulto tipo I," *Acta Neurológica Colombiana* 10 (3, Jul.-Sep.): 132-136. (Bogotá).

León, Fidias E., Amparo A. de León, A. Ariza-de León. 1995. "HLA, trans-Pacific contacts, and retrovirus," *Human Immunology* 42: 348.

León Portilla, Miguel. 1971. "Pre-hispanic literature," in *Archaeology of Northern Mesoamerica, Part 1*. Gordon F. Ekholm and Ignacio Bernal, eds., 10: 452-458, *Handbook of Middle American Indians*. (Austin, TX: University of Texas Press).

Levey, Martin. 1966. *The Medical Formulary of Aqrabadhin of Al-Kindi, Translated with a Study of its Materia Medica*. (Milwaukee, WI: University of Wisconsin Press).

Levey, Martin. 1973. *Early Arabic Pharmacology*. (Leiden, The Netherlands: E. J. Brill).

Lindemann, Hannes. 1957. *Alone at Sea*. (New York: Random House).

Ling Shun-Shêng. 1956. "Formosan sea-going raft (sic) and its origin in ancient China," *Bulletin of the Institute of Ethnology, Academia Sinica* 1: 25-54.

Linton, Ralph. 1925. "The Archaeology of the Marquesas Islands," *Bernice P. Bishop Museum, Bulletin No. 23*. (Honolulu, HI).

Linton, Ralph. 1926. "Ethnology of Polynesia and Micronesia." *Field Museum of Natural History, Department of Anthropology Guide, Part 6*. (Chicago, IL).

- Littauer, M. A. and J. H. Crouwel. 1979. *Wheeled Vehicles and Ridden Animals in the Ancient Near East*. (Leiden, The Netherlands: Brill).
- Littauer, M. A. and J. H. Crouwel. 1992. "Chariots," in *The Anchor Bible Dictionary*, Vol. I, ed.-in-chief David Noel Freedman, 888-892. (New York: Doubleday).
- Little, George A. 1946. *Brendan the Navigator*. (Dublin, Ireland: M. H. Gill).
- Loayza, Francisco A. 1948. *Chinos llegaron antes que Colón; tesis arqueológica . . .* (Lima, Peru: D. Miranda).
- Loeb, Edwin M. 1923. "The blood sacrifice complex," *Memoirs, American Anthropological Association*, No. 30. (Menasha, WI).
- Long, Austin, B. F. Benz, D. J. Donahue, A. J. T. Jull, and L. F. Toolin. 1989. "First direct AMS dates on early maize from Tehuacan, Mexico," *Radiocarbon* 31: 1035-1040.
- Lothrop, Samuel K. 1932. "Aboriginal navigation off the west coast of South America," *Journal of the Royal Anthropological Institute of Great Britain and Ireland* 62: 229-256.
- Lou Wing-Sou, Dennis. [Liu Tun Li]. 1956. "Similarities of Rain Worshipping of the Ancient Yuehs in South China and Certain American Indian Tribes." Unpublished M.A. thesis, Texas Christian University.
- Lowie, Robert H. 1951. "Some problems of geographical distribution," in *Südseestudien: Gedenkschrift Zur Erinnerung an Felix Speiser*, 11-26. (Basel, Switzerland: Museum für Völkerkunde, und Schweizerischen Museum für Volkskunde).
- Lubensky, Earl H. 1991. "Valdivia figurines," in *The New World Figurine Project*, Vol. 1. Terry Stocker, ed., 21-36. (Provo, UT: Research Press).
- Luna Cavazos, Mario, Mejun Jiao, and Robert Bye. 2000. "Phenetic analysis of *Datura* section *Datura* (*Solanaceae*) in Mexico," *Botanical Journal of the Linnean Society* 133: 493-507.
- MacCulloch, J. A. 1951a. "Incense," in *Encyclopedia of Religion and Ethics*, James Hastings, ed., 7: 201-205. (New York: Scribner's).
- MacCulloch, J. A. 1951b. "Baptism (ethnic)," in *Encyclopedia of Religion and Ethics*, James Hastings, ed., 2: 251-253. (New York: Scribner's).
- Mackenzie, Donald A. 1924. *Myths of Pre-Columbian America*. (London: Gresham).
- Mackenzie, Donald A. 1926. *The Migration of Symbols and Their Relation to Beliefs and Customs*. (London: Kegan Paul).

- MacLeod, William Christie. 1928. *The American Indian Frontier*. (New York: A. A. Knopf).
- MacLeod, William Christie. 1931. "Hook-swinging in the Old World and in America: a problem in cultural integration and disintegration," *Anthropos* 26: 551-561.
- MacLeod, William Christie. 1934. "The nature, origin, and linkages of the rite of hookswinging, with special reference to North America," *Anthropos* 29: 1-39.
- MacNeish, Richard S. 1992. *The Origins of Agriculture and Settled Life*. (Norman, OK: University of Oklahoma Press).
- MacNeish, Richard S., Annette Nelken-Terner, and Irmgard W. Johnson. 1967. *The Prehistory of the Tehuacan Valley*. Vol. 2. *Nonceramic Artifacts*. (Austin, TX: University of Texas Press).
- Magleby, Kirk. 1979. *A Survey of Mesoamerican Bearded Figures*. (Provo, UT: Foundation for Ancient Research and Mormon Studies, Preliminary Report MAG-79).
- Mair, Victor H. 2006. "Kinesis versus stasis, interaction versus independent invention," in *Contact and Exchange in the Ancient World*, Victor H. Mair, ed., 1-16. (Honolulu, HI: University of Hawai'i Press).
- Marcos, Jorge G. 1986. "De ida y vuelta a Acapulco con mercaderes de Mullu," in *Arqueología de la costa Ecuatoriana: nuevos enfoques*, Jorge G. Marcos, ed., 163-196. (Guayaquil, Ecuador: Escuela Politécnica del Litoral, Centro de Estudios Arqueológicos y Antropológicos, y Corporación Editora Nacional.)
- Marschall, Wolfgang. 1972. *Transpazifische Kulturbeziehungen: Studien zu ihrer Geschichte*. (Munich, Germany: Klaus Renner).
- Martí, Samuel. 1971. *Mudra: manos simbólicas en Asia y América*. (México: Litexa).
- Martínez Muriel, Alejandro Claudio. 1978. *Don Martín, Chiapas: inferencias económico-sociales de una comunidad arqueológica*. Unpublished thesis, Escuela Nacional de Antropología e Historia, and Universidad Nacional Autónoma de México (UNAM).
- McAllister, J. G. 1933. "The archaeology of Oahu," *Bernice P. Bishop Museum, Bulletin* No. 104. (Honolulu, HI).
- McIvor, Robert S. 2000. "Star patterns on the Aztec calendar stone," *Journal of the Royal Astronomical Society of Canada* 94 (April): 56-60.
- McNeill, William H. 1963. *The Rise of the West: A History of the Human Community* (Chicago, IL: University of Chicago Press).

- Means, Philip A. 1936. *Ancient Civilizations of the Andes*. (New York: Scribner's).
- Meggers, Betty J. 1963. "Cultural development in Latin America: an interpretative overview," in *Aboriginal Cultural Development in Latin America: An Interpretative Review*, Betty J Meggers and Clifford Evans, eds., 1: 131-148. *Smithsonian Miscellaneous Collections* 146. (Washington, DC).
- Meggers, Betty J. 1966. "Transpacific origin of Valdivia Phase pottery of Coastal Ecuador," in *Proceedings of the 36th International Congress of Americanists* (Barcelona and Sevilla, 1964) I: 63-67.
- Meggers, Betty J. 1975. "The transpacific origin of Mesoamerican civilization: a preliminary review of the evidence and its theoretical implication," *American Anthropologist* 77: 1-27.
- Meggers, Betty J. 1987. "El origen transpacífico de la cerámica Valdivia: una revaluación," *Boletín del Museo Chileno de Arte Precolombino*, No. 2: 9-31. (Santiago, Chile).
- Meggers, Betty J., Clifford Evans, and Emilio Estrada. 1965. "Early Formative period of coastal Ecuador; the Valdivia and Machalilla phases," *Smithsonian Contributions to Anthropology*, 1 (Washington: Smithsonian Institution).
- Mellén Blanco, Francisco. 1986. *Manuscritos y documentos españoles para la historia de la Isla de Pascua*. (Madrid, Spain: Centro de estudios de obras públicas y urbanismo).
- Mendoza, Gumesindo. 1877a. "Estudio comparativo entre el Sánscrito y el Náhuatl," *Anales del Museo Nacional*, 1a época, 75-84. (México).
- Mendoza, Gumesindo. 1877b. "Trabajo comparativo entre el Sánscrito, el Náhuatl, Griego y Latín," *Anales del Museo Nacional*, 1a época, 1: 286-288. (México).
- Menzies, Gavin. 2004. *1421 The Year China Discovered the World*. (London: Bantam Press).
- Metraux, Alfred. 1940. *Ethnology of Easter Island*. B. P. Bishop Museum, Bulletin, No. 160. Honolulu.
- Métraux, Alfred. 1957. *Easter Island: A Stone Age Civilization of the Pacific*. (New York: Oxford University Press).
- Milewski, Tadeuz. 1959. "La comparaison des systèmes anthroponymiques aztèques et indo-européens," *Onomastica* 5 (1): 119-175. (Krakow, Poland).
- Milewski, Tadeuz. 1960. "Similarities between the Asiatic and American Indian Languages," *International Journal of American Linguistics* 26: 265-274.

Milewski, Tadeuz. 1966. "Pochodzenie ludnosci Ameryki przedkolumbijskiej w odbiciu jezykowym," *Etnografia Polska* 10.

Miller, Mary, and Karl Taube. 1993. *The Gods and Symbols of Ancient Mexico and the Maya: An Illustrated Dictionary of Mesoamerican Religion*. (London: Thames and Hudson).

Milutis, Joe. 2006. *Ether: The Nothing That Connects Everything*. (Minneapolis, MN: University of Minnesota Press).

Mookerji, Radhakumud. 1912. *Indian Shipping. A History of the Sea-borne Trade and Maritime Activity of the Indians from the Earliest Times*. (London: Longman, Green).

Morales Belda, Francisco. 1970. *La marina de Al-Andalus*. (Barcelona, Spain: Ediciones Ariel).

Morris, Earl H. 1931. *Temple of the Warriors at Chichen Itza, Yucatan*. 2 vols. (Carnegie Institution of Washington, Publication 406).

Moseley, Michael E. 1969. "Assessing the archaeological significance of mahames," *American Antiquity* 34: 485-487.

Mountjoy, Joseph B., and John P. Smith. 1985. "An archaeological patolli from Tomatlán, Jalisco, Mexico," in *Contributions to the Archaeology and Ethnohistory of Greater Mesoamerica*, William J. Folan, ed., 240-262. (Carbondale and Edwardsville, IL: Southern Illinois University Press).

Mukerji, Dharendra Nath. 1936. "A correlation of the Maya and Hindu calendars," *Indian Culture* 2 (4): 685-692.

Müller, Florencia. 1978. *La cerámica del centro ceremonial de Teotihuacán*. (México: Instituto Nacional de Antropología e Historia).

Nadkarni, K. M., ed. 1914. *Indian Plants and Drugs with Their Medical Properties and Uses*. (Madras, India: Norton & Co. Reprinted 1998).

Needham, Joseph, and Lu Gwei-Djen. 1985. *Trans-Pacific Echoes and Resonances; Listening Once Again*. (Singapore and Philadelphia: World Scientific).

Needham, Joseph, Wang Ling, and Lu Gwei-Djen. 1971. *Science and Civilisation in China. Vol. 4. Physics and Physical Technology. Part III. Civil Engineering and Nautics*. (Cambridge, UK: Cambridge University Press).

Nelson, James Gordon. 1961. "The geography of the balsa," *American Neptune* 21: 157-195.

- Newcomb, Robert M., ed. and comp. 1963. *Plant and Animal Exchanges between the Old and the New Worlds*. (Notes from a Seminar at UCLA Presented by Carl O. Sauer). (Los Angeles, CA: Privately Printed).
- Nichols, Johanna. 1995. *Linguistic Diversity and the Peopling of the Americas*. (Berkeley, CA: University of California Press)
- Nicholson, Henry B. 1971. "Religion in pre-hispanic Central Mexico," in *Handbook of Middle American Indians*, Vol. 10. *Archaeology of Northern Mesoamerica*, Part 1. Gordon F. Ekholm and Ignacio Bernal, eds., 395-445. (Austin, TX: University of Texas Press).
- Nicholson, Irene. 1967. *Mexican and Central American Mythology*. (London: Paul Hamlyn).
- Nicolson, Dan H., C. R. Suresh, and K. S. Manilal. 1988. *An Interpretation of Van Rheede's Hortus Malabaricus*. (Königstein, Germany: Koeltz Scientific Books).
- Nielsen, Kjeld. 1986. *Incense in Ancient Israel*. (Leiden, The Netherlands: Brill).
- Nielsen, Kjeld. 1997. "Incense," in *The Oxford Encyclopedia of Archaeology in the Near East*, E.M. Meyers, ed., 3: 147-149. (New York: Oxford University Press).
- Nordenskiöld, Erland. 1933. "The origin of the Indian civilization in South America," in *Comparative Ethnographical Studies*, Vol. 9. E. Nordenskiöld, ed., 1-75. (Göteborg, Sweden: Pehrssons).
- Norman, V. Garth. 1976. *Izapa Sculpture. Part 2. Text*. (Brigham Young University, New World Archaeological Foundation, Papers No. 30, Part 2). (Provo, UT).
- Northern, Rebecca T. 1968. "The birdman bead," *Américas* 20 (3): 14-20.
- Norton, Presley. 1987. "El Señorío de Salangone y la liga de mercaderes. El cartel *spondylus*-balsa," in *Miscelanea Antropológica Ecuatoriana*. J. Alcina Franch and S. Moreno Yáñez, eds., 131-143. (*Boletín de los Museos del Banco Central del Ecuador* 6; and Cayambe, Ecuador: Ediciones Abya-Yala).
- Nuñez de la Vega, Francisco. 1702. *Constituciones diocesanas del Obispado de Chiappa*. (Rome).
- Nuttall, Zelia. 1906. "Some unsolved problems in Mexican archaeology," *American Anthropologist* (n.s.) 8 (1): 133-49.
- Ordoñez y Aguiar, Ramón de. 1907. *Historia de la creación del cielo y de la tierra*. (México).

- O'Rourke, Dennis H. 2009. "Human migrations: the two roads taken," *Current Biology* 19 (5): R204, www.sciencedirect.com.
- Pandey, D. S. 2000. "Exotics – introduced and natural immigrants, weeds, cultivated, etc.," in *Flora of India. Introductory Volume (Part II)*, N. P. Singh et al., eds, 266-301. (Calcutta, India: Botanical Survey of India).
- Parotta, John A. 2001. *Healing Plants of Peninsular India*. (New York: CABI Publishing).
- Parpola, Asko, and Simo Parpola. 1975. "On the relationship of the Sumerian toponym Meluhha and Sanskrit mlechha," *Studia Orientalia* 46: 205-238.
- Parsche, Franz. 1993. "Reply to 'Responding to first identification of drugs in Egyptian mummies'." *Naturwissenschaften* 80: 245-6.
- Parsche, Franz, Svetlana Balabanova, and Wolfgang Pirsig. 1993. "Drugs in ancient populations," *The Lancet* 341: 503.
- Parsche, Franz, and A. Nerlich. 1995. "Presence of drugs in different tissues of an Egyptian mummy," *Fresenius' Journal of Analytical Chemistry* 352: 380-384.
- Patiño, Victor Manuel. 1976. *Plantas cultivadas y animales domésticos en América equinoccial. Tomo II. Plantas alimenticias*. (Cali, Colombia: Imprenta Departamental).
- Pedersen, Johannes. 1946. *Israel, Its Life and Culture*. 4 vols. (London: Oxford University Press, and Copenhagen: Branner Og Korch).
- Piña Chan, Román, and Luis Covarrubias. 1964. *El pueblo del jaguar (Los olmecas arqueológicos)*. (México: Consejo para la Planeación e Instalación del Museo Nacional de Antropología). (México).
- Pokharia, A. K., and K. S. Saraswat. 1999. "Plant economy during the Kushana period (100-300 A.D.) at ancient Sanghol, Punjab," *Pragdhara [Journal of the U(ttar) P(radesh) State Archaeology Department]* 9: 75-104.
- Pohl, Frederick J. 1973. "Did ancient Romans reach America?" *New Diffusionist* 3 (10): 23-37.
- Pollock, Sheldon. 2001. "The death of Sanskrit", *Comparative Studies in Society and History* 43 (2): 392-426.
- Pritchard, James B. 1969. *Ancient Near Eastern Texts Relating to the Old Testament*. 3rd ed. (Princeton, NJ: Princeton University Press).
- Probst, Peter S. 1963. *Mirrors of Ancient China and Pre-Columbian America*. Unpublished M.A. thesis, Columbia University.

- Proskouriakoff, Tatiana. 1968. "Olmec and Maya art: problems of their stylistic relation," in *Dumbarton Oaks Conference on the Olmec, October 28th and 29th, 1967*. E. P. Benson, ed., 119-134. (Washington: Dumbarton Oaks Research Library).
- Pullaiah, T. 2002. *Medicinal Plants in India*. 2 vols. (New Delhi, India: Regency Publications).
- Quimby, George I. 1985. "Japanese wrecks, iron tools, and prehistoric Indians of the Northwest Coast," *Arctic Anthropology* 22 (2): 7-15.
- Quinn, David Beers. 1989. "Atlantic Islands," in *Atlantic Visions (Proceedings of the First International Conference of the Society of Saint Brendan, September 1985, Dublin and Kerry)*, John de Corcy Ireland and David C. Sheehy, eds., 77-93. (Dublin, Ireland: Boole Press).
- Recinos, Adrián, and Delia Goetz, translators. 1953. *The Annals of the Cakchiquels*; [and,] Dionisio José Chonay and Delia Goetz, translators. *Title of the Lords of Totonicapán*. (Norman: University of Oklahoma Press).
- Reinhard, Karl J. 1992. "Parasitology as an interpretive tool in archaeology," *American Antiquity* 57 (2): 231-245.
- Rendon, S., editor. 1965. *Relaciones originales de Chalco Amequemecan. Paleografiadas y traducidas del Náhuatl, con una introducción*. (Biblioteca Americana, Serie Literatura Indígena). (México: Fondo de Cultura Económica).
- Rensch, Karl H. 1991. "Polynesian plant names, linguistic analysis and ethnobotany, expectations and limitations," in *Islands, Plants, and Polynesians: An Introduction to Polynesian Ethnobotany*, Paul Alan Cox and Sandra Anne Banack, eds., 97-111. (Portland, OR: Dioscorides Press).
- Riley, Carroll L., J. Charles Kelley, Campbell Pennington, and Robert L. Rands. 1971. "Conclusions," in *Man across the Sea: Problems of Pre-Columbian Contacts*, Carroll L. Riley et al., eds., 445-458. (Austin, TX: University of Texas Press).
- Rivet, Paul. 1956. "Las relaciones antiguas entre Polinesia y América," *Diogenes* 4(16): 107-119.
- Robertson, John, and Stephen Houston. 2003. "El problema del Wasteko: una perspectiva lingüística y arqueológica," in *XVI Simposio de Investigaciones Arqueológicas en Guatemala. Museo Nacional de Arqueología y Etnología, 2002*, J. P. Laporte, B. Arroyo, H. L. Escobedo, y H. E. Mejía, eds., I: 723-733. (Guatemala: Ministerio de Cultura y Deportes; Instituto de Antropología e Historia; and Asociación Tikal).

Robinson, Lila. 1969. Linguistic and Folkloric Analyses of Cashibo Narrative Prose. Unpublished Ph.D. dissertation, University of Texas, Austin.

Rouget, Gilbert. 1948. "La conque comme signe des migrations océaniques en Amérique," in Proceedings of the 28th International Congress of Americanists (Paris, 1947), 297-305. (Paris).

Rowe, John Howland. 1947. "Inca culture at the time of the Spanish Conquest," Handbook of South American Indians. Julian H. Steward, ed., 487-543. Bureau of American Ethnology, Bulletin No. 143. (Washington, DC).

Roxburgh, W. 1814. Hortus Bengalensis. (Serampore, India).

Roys, Ralph L. 1931. "The ethno-botany of the Maya," Tulane University, Middle American Research Series, Publ. No. 2. (New Orleans).

Ruhlen, Merritt. 1998. "The origin of the Na-Dene," Proceedings, National Academy of Sciences USA 95 (Nov.): 13994-13996.

Ruppert, Karl. 1940. "A special assemblage of Maya structures," in The Maya and Their Neighbors, 222-230. (New York: Appleton-Century).

Sadovszky, Otto J., von. 1984. "Ob-Ugrian elements in the adverbs, verbal prefixes and prepositions of California Wintuan," in Congressus Quintus Internationalis Fenno-Ugristarum (Turku, Finland, 1980) 6: 237-243).

Sadovszky, Otto J., von. 1985. "Die Zeit der Ankunft der Cal-Ugrier in Kalifornien im Lichte des ugrischen Lautwechsels *k->x->h-," in Congressus Sextus Internationalis Fenno-Ugristarum, Abstracts: Linguistics, 1:19. (USSR Academy of Sciences. Komy Branch: Syktyvkar).

Sadovszky, Otto J., von. 1996. The Discovery of California: A Cal-Ugrian Comparative Study. (Budapest: Akademiai Kiado, and Los Angeles: International Society for Trans-Oceanic Research).

Safford, William E. 1905. "The useful plants of the island of Guam," Contributions from the U. S. National Herbarium, Vol. IX. (Washington, DC).

Sahagun, Bernardino de. 1946. Historia General de la Cosas de Nueva España. 3 vols. (México: Nueva España).

Saraswat, K.S., N. K.Sharma and D. C. Saini. 1994. "Plant economy at ancient Narhan (ca. 1300 B.C.-300/400 A.D.)" in Excavations at Narhan (1984-1989), Appendix IV, 225-337. (Varanasi, India: Department of Ancient Indian History, Culture, and Archaeology, Banaras Hindu University).

- Satterthwaite, Linton, Jr. 1946. "Incense burning at Piedras Negras," *University of Pennsylvania Museum Bulletin* 11 (4): 16-22.
- Sauer, Jonathan D. 1950. "The grain amaranths: a survey of their history and classification," *Annals of the Missouri Botanical Garden* 37: 561-632.
- Sayce, A. H. 1951. "Cosmogony and cosmology," in *Encyclopedia of Religion and Ethics*, James Hastings, ed., 1: 128-129. (New York: Scribner's).
- Schneider, Harold K. 1977. "Prehistoric transpacific contact and the theory of culture change," *American Anthropologist* 79: 9-25.
- Schobinger, Juan. 1956. "Las 'clavas insignias' de Argentina y Chile; descripción de nuevos ejemplares procedentes de las provincias del Neuquén y Mendoza, y análisis del conjunto," *Runa* 7 (2): 252-280.
- Schroeder, Gerhard. 1957. "Hallazgos de artefactos de piedra en el Perú y los problemas del poblamiento de América," *Revista del Museo Nacional* 26: 290-294.
- Science News. 1996. "Polynesian tools tout ancient travels," *Science News* 149 (Mar. 2): 135.
- Seler, Eduard. 1898. *Gesammelte Abhandlungen zur Amerikanischen Sprach- und Alterthumskunde*. Vol. 2. (Berlin: A. Asher).
- Service, Robert F. 1996. "Rock chemistry traces ancient traders," *Science* 274 (20 Dec.): 2012-2013.
- Shapiro, Harry L. 1964. *The Peopling of the Pacific Rim*. (The Thomas Burke Memorial Lecture, 1964). Seattle, WA: Thomas Burke Memorial, Washington State Museum).
- Shao, Paul. [Shao Pang-hua]. 1976. *Asiatic Influences in Pre-Columbian American Art*. (Ames, Iowa: Iowa State University Press).
- Shao, Paul. [Shao Pang-hua]. 1983. *The Origin of Ancient American Cultures*. (Ames, Iowa: Iowa State University Press).
- Shlush, Liran I., D. M. Behar, G. Yudkovsky, A. Templeton, Y. Hadid, F. Basis, M. Hammer, S. Itzkovitz, and K. Skorecki. 2008. "The Druze: a population genetic refugium of the Near East," *PloS ONE* 3 (5): e205.
- Shook, Edwin M. and Alfred V. Kidder. 1952. *Mound E-III-3, Kaminaljuyu, Guatemala*. (Carnegie Institution of Washington, Contributions to American Anthropology and History, No. 53).

Shuang, Shaohua B. 1992. Chinese Ancestors Opened up America. (Heilongjiang, China: Heilongjiang Press).

Silow, R. A. 1949. "The problem of trans-Pacific migration involved in the origin of the cultivated cottons of the New World," *Proceedings, Seventh Pacific Science Congress*, 5: 112-118.

Singhal, D. P. 1969. *India and World Civilization*, Vol. 2. (East Lansing, MI: Michigan State University Press).

Sivarajan, V. V., and Philip Mathew. 1984. *Flora of Nilambur (Western Ghats, Kerala)*. (Dehra Dun, India: Bishen Singh Mahendra Pal Singh).

Skottsberg, Carl J. F., ed. 1920. *The Phanerogams of Easter Island*, Vol. 1 of *The Natural History of Juan Fernández and Easter Island*. (Uppsala, Sweden: Almqvist and Wiksells Boktryckeri).

Smith, Grafton Elliot. 1919. "Dragons and rain gods," *Bulletin of the John Rylands Library* 5: 317-380.

Smith, Grafton Elliot. 1924. *Elephants and Ethnologists: Asiatic Origins of the Maya Ruins*. (London: Kegan Paul, Trench, Trubner; and New York: Dutton).

Sorenson, John L. 1952. *Evidences of Culture Contacts between Polynesia and the Americas in Precolumbian Times*. Unpublished M.A. thesis, Brigham Young University.

Sorenson, John L. 1955. "Some Mesoamerican traditions of immigration by sea," *El México Antiguo* 8 (Dic.): 425-438.

Sorenson, John L. 1971. "The significance of an apparent relationship between the ancient Near East and Mesoamerica," in *Man across the Sea: Problems of Pre-Columbian Contacts*, C. L. Riley et al., eds., 219-241. (Austin: University of Texas Press).

Sorenson, John L. 2009. *A Complex of Ritual and Ideology Shared by Mesoamerica and the Ancient Near East*. (Sino-Platonic Papers No. 195). (Philadelphia: University of Pennsylvania Department of East Asian Language and Civilization). (PDF accessible at <http://sino-platonic.org>)

Sorenson, John L. 2010. *The Death of Paradigms*. Unpublished paper presented at the Royal Geographical Society, London, May 2010.

Sorenson, John L., and Martin H. Raish. 1996. *Pre-Columbian Contact with the Americas across the Oceans: An Annotated Bibliography*. 2 vols. 2nd ed. (Provo, UT: Research Press).

Sorenson, John L., and Carl. L. Johannessen. 2004. *Scientific Evidence for Pre-Columbian*

Transoceanic Voyages to and from the Americas. (Sino-Platonic Papers No. 133). (Philadelphia: University of Pennsylvania, Department of Asian and Middle Eastern Studies).

Sorenson, John L., and Carl L. Johannessen. 2006. "Biological evidence for pre-Columbian transoceanic voyages," in *Contact and Exchange in the Ancient World*, Victor H. Mair, ed., 238-297. (Perspectives on the Global Past, 2). (Honolulu, HI: University of Hawai'i Press).

Sorenson, John L., and Carl L. Johannessen. 2009. *World Trade and Biological Exchanges before 1492*. (New York and Bloomington, IN: iUniverse). (Revised and expanded edition. Eugene, OR: Carl L. Johannesse , 2013.)

Spinden, Herbert J. 1924. "New World correlations," in *Proceedings of the 21st International Congress of Americanists* (Part 1, The Hague, 1924), pages 76-86.

Speiser, Ephraim. 1935. *Excavations at Tepe Gawra. Vol. 1*. (Philadelphia, PA: University of Pennsylvania Press).

Spinden, Herbert J. 1933. "Origin of civilizations in Central America and Mexico," in *The American Aborigines: Their Origin and Antiquity. A Collection of Papers by Ten Authors* (Published for Presentation at the Fifth Pacific Science Congress, Canada, 1933). D. Jenness, ed., 217-246. (Toronto, Ont.: University of Toronto Press).

Standley, Paul C. 1920-1926. *Trees and Shrubs of Mexico*. (Contribution from the United States National Herbarium 23). (Washington, DC: Smithsonian Institution).

Starr, Frederick. 1937-1939. *Nuzi: Report on the Excavation at Yorgan Tepe near Kirkuk, Conducted by Harvard University in Conjunction with the American School of Oriental Research and the University Museum of Philadelphia, 1927-1931*. 2 vols. (Cambridge, MA: Harvard University Press).

Steele, D. Gentry, and Joseph F. Powell. 2002. "Facing the past: a view of the North American human fossil record," in *Memoirs Presented to the California Academy of Sciences*, Vol. 27: 93-122).

Steffy, J. Richard. 1985. "The Kyrenia ship: an interim report on its hull construction," *American Journal of Archaeology* 89: 71-101.

Steffy, J. Richard. 2001. E-mail to John L. Sorenson. Subject: "*Agave*," 18 April.

Stengar, Alison T. 1989. "Japanese influenced ceramics in pre-contact Washington state: a view of the wares and their possible origin," in *Reprint Proceedings, Circum-Pacific Prehistory Conference, Seattle, August 1-6, 1989, Part VIII: Prehistoric Trans-Pacific Contacts*. (Pullman, WA: Washington State University Press).

- Stewart, Joe D. 1974. Mesoamerican and Eurasian Calendars. Unpublished Ph.D. dissertation, University of Calgary (Canada).
- Stimson, J. F. 1933. "Tuamotuan religion," Bernice P. Bishop Museum, Bulletin No. 103. (Honolulu, HI).
- Stodder, Ann L. W., and Debra L. Martin. 1991. "Health and disease in the Southwest before and after Spanish contact," in *Disease and Demography in the Americas*, John W. Verano and Douglas H. Ubelaker, eds., 55-73. (Washington: Smithsonian Institution Press).
- Stokes, J. F. G. 1932. "Spaniards and the sweet potato in Hawaii and Hawaiian-American contacts," *American Anthropologist*, n.s., 34: 594-600.
- Stubbs, Brian. 1988. *Elements of Hebrew in Uto-Aztecan: A Summary of the Data*. (Provo, UT: Foundation for Ancient Research and Mormon Studies, Preliminary Report STU-88).
- Stubbs, Brian. 2004. *A Few Hundred Hints of Egyptian and Two Dialects of Hebrew (or Northwest Semitic) in Uto-Aztecan*. Unpublished 142-page manuscript. (Copy in J. L. Sorenson's possession).
- Stubbs, Brian D. 2008. *Uto-Aztecan: A Comparative Vocabulary*. 4th ed. (Yorba Linda, California: Shumway).
- Stuiver, Minze, and Paula J. Reimer. 2003. "Extended ¹⁴C database and revised CALIB radiocarbon calibration program," *Radiocarbon* 35 (1993): 215-230 (version 4.3 {2003}, online edition at <http://calib.org/calib/>)
- Swadesh, Morris. 1960. "On interhemisphere linguistic connections," in *Culture and History: Essays in Honor of Paul Radin*, Stanley Diamond, ed., 894-924. (New York: Columbia University Press).
- Symon, David E., and L. A. R. Haegi. 1991. "Datura (*Solanaceae*) is a New World genus," *Solanaceae III Taxonomy, Chemistry, Evolution*, J. G. Hawkes, R. N. Lester, M. Nee, and N. Estrada, eds., 197-210. (Richmond, Surrey, UK: Royal Botanic Gardens, Kew, for the Linnean Society of London).
- Tang, Didi. 2012. "Pottery fragments found in cave are 20,000 years old," (Associated Press) *Deseret News* (Salt Lake City), June 29, 2012. (Reprising an article by Wu Xiaohong et al. in *Science*, 3 Feb. 2012).
- Teeter, Wendy G. 2004. "Animal utilization in a growing city, vertebrate exploitation at Caracol, Belize," in *Maya Zooarchaeology: New Directions in Method and Theory*. (Monograph 51). Kitty F. Emery, ed., 177-191, (Los Angeles, CA: Cotsen Institute of Archaeology, University of California, Los Angeles).
- Tewari, Shitala P. 1987. *Contributions of Sanskrit Inscriptions to Lexicography*. (Delhi,

India: Agam Kala Prakashan).

Thapa, J. K. 1966. "Primitive maize with the Lepchas," *Bulletin of Tibetology* 3: 29-31. (Gangtok, India: Namgyal Institute of Tibetology).

Thompson, J. Eric S. 1950. *Maya Hieroglyphic Writing*. (Carnegie Institution of Washington Publ. 589; reprinted 1960, Norman: University of Oklahoma Press).

Thompson, R. Campbell. 1949. *A Dictionary of Assyrian Botany*. (London: The British Academy).

Tolstoy, Paul. 1963. "Cultural parallels between Southeast Asia and Mesoamerica in the manufacture of bark cloth," *Transactions of the New York Academy of Sciences* 25: 646-662.

Tolstoy, Paul. 1974. "Transoceanic diffusion and nuclear Mesoamerica," in *Prehispanic America*, Shirley Gorenstein, ed., 124-144. (New York: St. Martin's).

Torkelson, Anthony R. 1999. *Plants in Indian Medicine A-Z*. Vol. IV. *The Cross Name Index to Medicinal Plants*. (Boca Raton, Florida: CRC Press).

Towle, Jerry. "Jade: an indicator of trans-Pacific contact?," *Yearbook of the Association of Pacific Coast Geographers* 35: 165-172.

Towle, Margaret A. 1961. "The ethnobotany of pre-Columbian Peru," *Viking Fund Publications in Anthropology* 30. (New York: Wenner-Gren Foundation for Anthropological Research).

Tozzer, Alfred M., ed. and trans. 1941. "Landa's *Relacion de las cosas de Yucatan*: a translation," *Harvard University, Peabody Museum of American Archaeology and Ethnology, Papers*, Vol. 18.

Trachtenberg, E. A., H. A. Erlich, O. Rickard, G. F. DeStefano, and W. Klitz. 1995. "HLA Class II linkage disequilibrium and haplotype evolution in the Cayapa Indians of Ecuador," *American Journal of Human Genetics* 57: 415-424.

Tregear, E. 1904. *The Maori Race*. (Wanganui, New Zealand).

Taylor, Edward B. 1878. "On the game of patolli in ancient Mexico, and its probably Asiatic origin," *Journal of the Anthropological Institute* 8: 116-131.

Taylor, Edward B. 1894. "On the diffusion of mythical beliefs as evidence in the history of culture," *Report of the British Association*, 774-775.

Taylor, Edward B. 1896. "On American lot-games as evidence of asiatic intercourse before the time of Columbus," *Internationales Archiv für Ethnographie* 9 (supplement): 55-67.

(Leiden).

Vaillant, George C. 1950. *Aztecs of Mexico*. (Pelican edition). (Harmondsworth, England: Penguin).

Verano, John W. 1991. "Prehistoric disease and demography in the Andes," in *Disease and Demography in the Americas*, John W. Verano and Douglas H. Ubelaker, eds., 15-24. (Washington: Smithsonian Institution Press).

Verano, John W. 1998. "Disease in South American mummies," in *Mummies, Disease and Ancient Cultures*. 2nd ed. A. Cockburn, E. Cockburn, and T. A. Reyman, eds., 215-234. (Cambridge, UK: Cambridge University Press).

Verneau, René, and Paul Rivet. 1924. *Ethnographie ancienne de l'Equateur*. (Paris: Gauthier-Villars).

Villiers, Alan John. 1957. *Wild Ocean: The Story of the North Atlantic and the Men Who Sailed It*. (New York: McGraw-Hill).

Vining, Edward P. 1885. *An Inglorious Columbus; or, Evidence that Hwui Shan and a Party of Buddhist Monks from Afghanistan Discovered America in the Fifth Century, A.D.* (New York: D. Appleton).

Vishnu-Mittre, Aruna Sharma, and Chanchala [sic]. 1986. "Ancient plant economy at Daimabad," in *Daimabad 1976-79, Appendix II*. S. A. Dali, ed., 588-627. (Calcutta, India: Government of India Central Publication Branch. *Memoirs of the Archaeological Survey of India* 83).

Vokes, Emily H. 1963. "A possible Hindu influence at Teotihuacan," *American Antiquity* 29: 94-95.

Von Hagen, Victor Wolfgang. 1944. *The Aztec and Maya Papermakers*. (New York: J. J. Augustin).

Waisbard, Simone. 1980. "L'origine de Naymlap, roi de Lambayeque," *Kadath: Chroniques des civilisations disparues*, No. 39: 7-13. (Brussels).

Wallace, Howard. 1961. "Leviathan and the beast in Revelation," in *Biblical Archaeologist Reader*, G. E. Wright and David N. Freedman, eds., 290-298. (Chicago, IL: Quadrangle).

Watson, Douglas S. 1935. "Did the Chinese discover America? A critical examination of the Buddhist Priest Hui Shên's account of Fu Sang and the apocryphal voyage of the Chinese navigator Hui-Li," *California Historical Society Quarterly* 14: 47-58.

Watson, John Forbes. 1868. *Index to the Native and Scientific Names of Indian and Other Eastern Economic Plants and Products*. (London: India Museum).

- Watt, George. 1888-1893. A Dictionary of the Economic Products of India. 6 vols. (Calcutta, India: Superintendent of Government Printing).
- Wendel, Jonathan F. 1989. "New World tetraploid cottons contain Old World cytoplasm," *Proceedings, National Academy of Sciences USA* 86: 4132-4136.
- Wendel, Jonathan F., Andrew Schnabel, and T. Seelanan. 1995. "An unusual ribosomal DNA sequence from *Gossypium gossypoides* reveals ancient, cryptic, intergenomic introgression," *Molecular Phylogenetics and Evolution* 4: 298-313.
- Whalen, M. D., D. E. Costich, and C. B. Heiser. 1981. "Taxonomy of *Solanum* section *Lasiocarpa*," *Gentes Herbarum* 12: 41-129.
- Wheatley, P. 1983. *Nagara and Commandery: Origins of the Southeast Asian Urban Traditions*. (Department of Geography Research Papers 207-8, University of Chicago).
- Wheeler, Jim. 1982. "Comment on Ben Finney's review," *Archaeoastronomy* 5 (3): 8.
- Whistler, W. Arthur. 1990. "The other Polynesian gourd," *Pacific Science* 44: 115-122.
- Whistler, W. Arthur. 1991. "Polynesian plant introductions," in *Islands, Plants, and Polynesians: An Introduction to Polynesian Ethnobotany*, Paul Alan Cox and Sandra Anne Banack, eds., 41-66. (Portland, OR: Dioscorides Press).
- Wichmann, Søren. 1995. *The Relationship among the Mixe-Zoquean Languages of Mexico*. (Salt Lake City, UT: University of Utah Press).
- Wiercinski, Andrzej. 1972a. "Inter- and intrapopulational racial differentiation of Tlatilco, Cerro de las Mesas, Teotihuacan, Monte Alban and Yucatan Maya," *Actas, Documentos y Memorias, 39a Congreso Internacional de Americanistas, Lima, 1970*. Vol. 1: 231-248. (Lima, Peru: Instituto de Estudios Peruanos).
- Wiercinski, Andrzej. 1972b. "An anthropological study on the origin of 'Olmecs,'" *Swiatowit* 33: 143-174. (Warsaw, Poland).
- Wiesheu Forster, Walburga Ma. 1998. "La conexión chino-maya. Reflexiones preliminares sobre la 'hipótesis del substrato circumpacífico'," *Amerística: La ciencia del Nuevo Mundo*, año 1 (no.1): 95-104. (México).
- Wilkinson, I. G. 1879. *The Manners and Customs of the Ancient Egyptians*. 3 vols. (New York: Scribner and Welford).
- Willey, Gordon R. 1964. Review of *Aboriginal Cultural Development in Latin America*, Betty J. Meggers and Clifford Evans, eds., *American Anthropologist* 66: 442-446.

Willey, Gordon R. 1971. *An Introduction to American Archaeology*. Vol. 2. (Englewood Cliffs, NJ: Prentice-Hall).

Willey, Gordon R. 1985. "Some continuing problems in New World culture history," *American Antiquity* 50: 351-63.

Willis, William. 1955. *The Gods Were Kind: An Epic 6,700 Mile Voyage Alone across the Pacific*. (New York: Dutton).

Wirth, Diane E. 2003. *Parallels: Mesoamerican and Ancient Middle Eastern Traditions*. (St. George UT: Stonecliff).

Wood, Francis. 2002. *The Silk Road: Two Thousand Years in the Heart of Asia*. (Berkeley, CA: University of California Press).

Wuthenau, Alexander Von. 1965. *Altamerikanische Tonplastik: Des Menschenbild der Neuen Welt*. (Baden-Baden, Germany: Holle Verlag).

Wuthenau, Alexander Von. 1975. *Unexpected Faces in Ancient America, 1500 B.C.-A.D. 1500. The Historical Testimony of Pre-Columbian Artists*. (New York: Crown).

Xella, Paolo. 1995. "Death and the afterlife in Canaanite and Hebrew thought," in *Civilizations of the Ancient Near East*, Jack M. Sasson et al., eds., 3: 2059-2070. (New York: Charles Scribner's Sons, Macmillan Library Reference USA, and Simon and Schuster Macmillan).

Xu, Hui (Mike). 1996. *Origin of the Olmec Civilization*. (Edmond, OK: University of Central Oklahoma Press).

Xu, Hui (Mike). 2002. "New evidence for pre-Columbian transpacific contact between China and Mesoamerica," *Journal of the Washington Academy of Sciences* 88 (1, Mar.): 1-11.

Yacovleff, E., and F. L. Herrera. 1934-1935. "El mundo vegetal de los antiguos peruanos," *Revista del Museo Nacional* 3: 243-322.

Yen, Douglas E. 1963. "Sweet-potato variation and its relation to human migration in the Pacific," in *Plants and the Migrations of Pacific People, A Symposium Held at the Tenth Pacific Sciences Congress* (Honolulu, 1961). J. Barrau, ed., 93-117. (Honolulu, HI: B. P. Bishop Museum Press).

Yen, Douglas E. 1974. "The sweet potato and Oceania: an essay in ethnobotany," *B. P. Bishop Museum Bulletin* 236. (Honolulu, HI: Bishop Museum Press).

Yen, Douglas E. 1998. "Subsistence to commerce in Pacific agriculture: some four thousand years of plant exchange," *Plants for Food and Medicine: Proceedings of the Joint Conference of the Society for Economic Botany and the International Society for Ethnopharmacology*, London, 1-6 July 1996. H. D. V. Prendergast, N. L. Etkin, D. R. Harris, and P. J. Houghton, eds, 161-183. (Kew, UK: Royal Botanic Gardens).

Zaki, Andrzej. 1981. "Uwagi o archeologii wyspy wielkanocnej." *Symposiones*, I: 231-53. (Paper delivered at the First Symposium of the Polish University in Exile in London, on 15 October 1978).

Zeven, A. D., and J. M.J. de Wet. 1982. *Dictionary of Cultivated Plants and Their Regions of Diversity, Excluding Most Ornamentals, Forest Trees and Lower Plants*. (Wateningin, The Netherlands: PUDOC, Centre for Agricultural Publishing and Documentation).



Fig. 1a. Iraq (Starr 1937-39, 2: Pl. 113) Fig. 1b. Mesopotamia (Frankfort 1935, Pl. 48)

Fig. 1c. Oaxaca, Mexico (Leigh Coll., courtesy INAH)

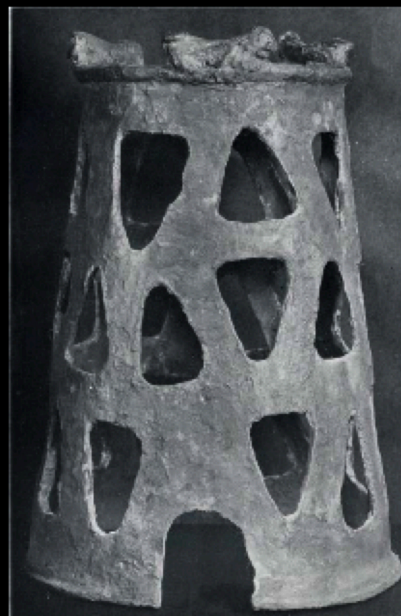
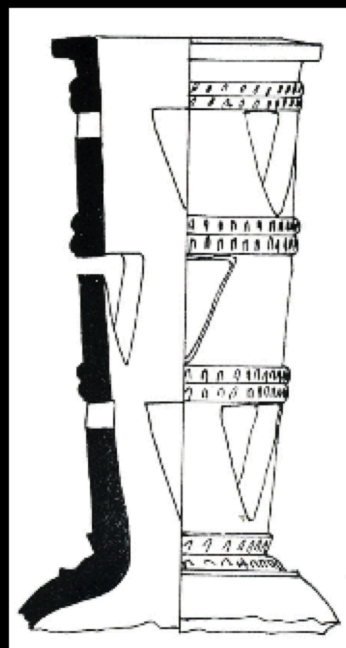


Fig. 2a. Iraq (Starr 1937-39, 2: Pl. 114)

Fig. 2b. Iraq (Starr 1937-39, 2: 120)

Fig. 2c. Guatemala (Borhegyi 1951. 111)

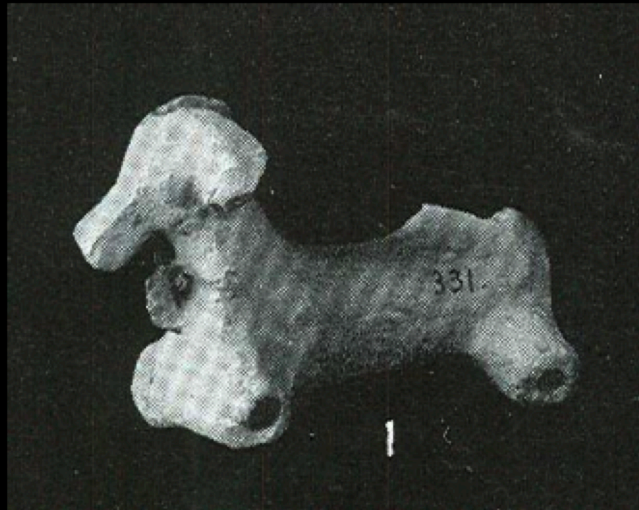


Fig. 3a. Dog, Mexico (P. Cheesman photo collection, BYU Library)

Fig. 3b. Dog, Mesopotamia (Speiser 1935, 68)



Fig. 4a. Iran (Biblic. Arch. Rev. 1996, 22(5): 80)

Fig. 4b. Mexico (P. Cheesman photo collection, BYU Library)

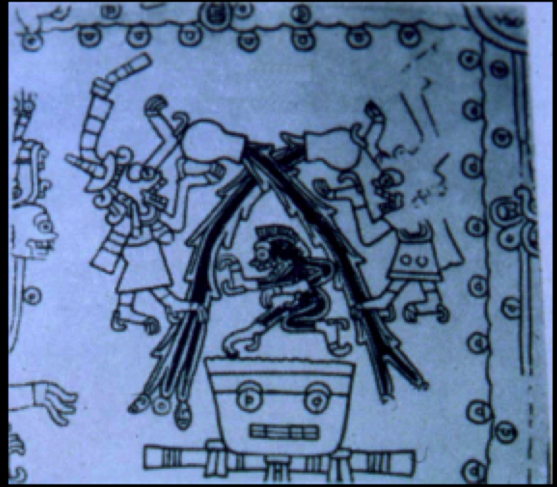


Fig. 5a. Mexico (Seler 1898, 2:31)

Fig. 5b. Egypt (Gardiner 1950)



Fig. 6. Tlatilco, Mexico (Milwaukee Publ. Mus., photo R. Hristov)



Fig. 7a. Mexico (Wuthenau 1965, 61)



Fig. 7b. Mexico (Wuthenau 1965, 42)

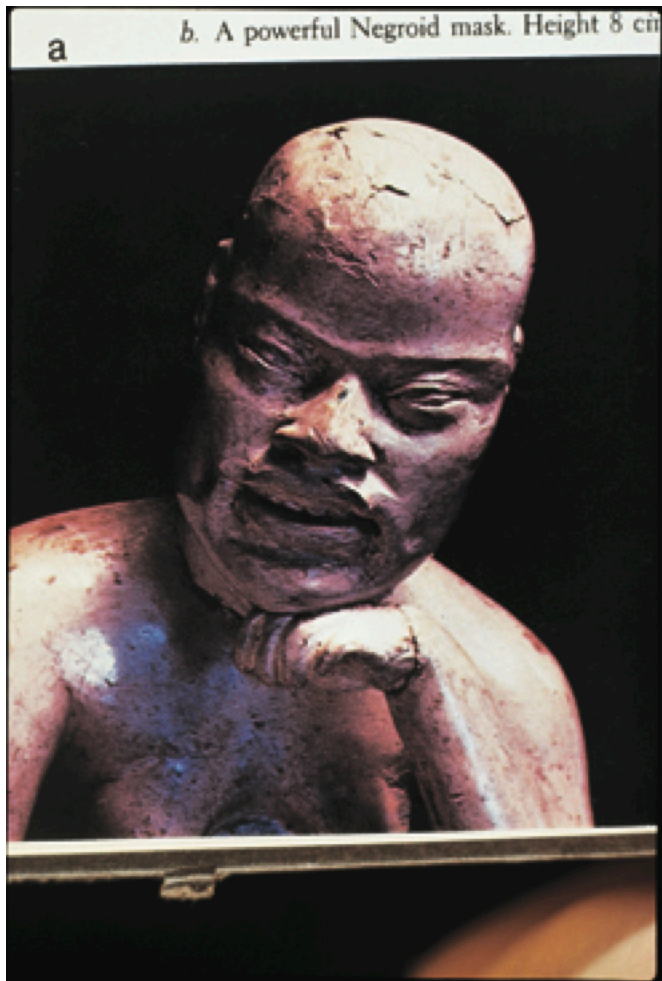


Fig. 7c. Mexico (Wuthenau 1965, 56)



Fig. 7d. Guatemala (Wuthenau 1965, 167)



Fig. 7e. Mexico (Wuthenau 1965, 135)

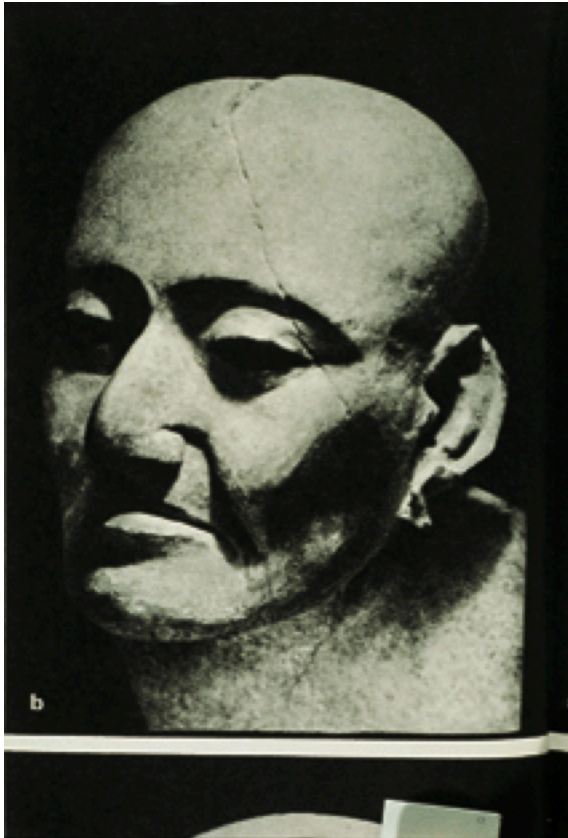


Fig. 7f . Mexico (Wuthenau 1965, 134)



Fig. 7g. Mexico (Photo courtesy A. Christenson)



Fig. 7h. Mexico (Wuthenau 1965, 115)



Fig. 7i. Mexico (Wuthenau 1965, 136)



Fig. 7j. Mexico (Wuthenau 1965, 135)