Agricultural Origins: Centers and Noncenters

Agriculture may originate in discrete centers or evolve over vast areas without definable centers.

Jack R. Harlan

For nearly half a century the charisma of N. I. Vavilov and the elegant simplicity of his methodology have dominated theories and concepts about the origin of cultivated plants. To be sure, it has long been known that a center of diversity is not the same as a center of origin (*1–4*). Vavilov himself recognized the problem when he established the concept of secondary centers, but it is still useful to classify the variation within a cultigen and to plot the geographic distribution of variation. Patterns of variation provide significant information and are still basic to an understanding of the germ plasm of a crop, but Vavilovian theory has been virtually demolished by other sources of evidence.

Vavilov (*5*, *6*) classified the variation within a crop in detail and then established the region or regions of maximum diversity. Using this technique, he established eight "centers of origin" (Fig. 1). P. M. Zhukovsky (*7*), an associate of Vavilov and for some years director of what is now the Vavilov All-Union Institute of Plant Industry, found it necessary to enlarge and add to Vavilov's centers in order to account for the evidence (Fig. 2). By expanding the centers to megacenters, he merely divided the world into regions and essentially admitted there were no centers. To draw a line around a continent and call it a "center" is to distort the concept of a center. H. Brücher (*2*) has questioned whether gene centers exist at all, and, after many years of field work in Africa and Asia, I am prepared to question even the fundamental concept of "centers" as a universal phenomenon.

The idea of a center—an area in which things originate and out of which things are dispersed—is reasonable, logical, and intellectually satisfying, but it does not always agree with the evidence. Sometimes there are centers, and sometimes there are noncenters. In this article I present some new concepts concerning the phytogeography of cultivated plants and the origins of agriculture. The most evident contrast is between the situation in the Near East and that in Africa.

Methodology

It has long been apparent that the methodology of "differential phytogeography" proposed by Vavilov (*6*) is entirely inadequate for locating the geographic regions in which specific crops originated. The problem is much too complex to be solved by such a simple device, and every scrap of evidence is needed from any source that might be even inferentially pertinent. Vavilov was entirely correct in stating that the problem could not be solved without a thorough knowledge of the crop and its spontaneous relatives, and that the variation must be studied in detail and in depth. But this information alone is far from adequate. In Vavilov's time it was not possible to predict the enormous support that archeology in general and archeobotany in particular could give studies of the origin of cultivated plants and the emergence of agriculture (*3*). Modern studies enlist the support of every field that can provide any sort of useful information.

The sources of evidence for the origin and dispersal of cultivated plants may be very briefly summarized as follows.

1) Plants (living): biosystematic analyses, including genetics, cytogenetics, chemotaxonomy, numerical taxonomy, morphology, ecology, geography, and so on, of the crops and their near relatives (essentially the Vavilovian approach).

2) Plants (past): archeobotany, palynology, paleobotany, carbon-14 dating.

3) Men (living): linguistics, oral tradition, techniques of use and cultivation, attitudes toward the crop in culture, religion, magic, witchcraft, and so on.

4) Men (past): history, art, archeology (artifacts and refuse left by man).

5) Other sources: geology, hydrology, erosion and siltation patterns, soil analyses, limnology, animal remains, and so on, for supporting evidence of changes in climate, vegetation, and fauna, as well as for circumstantial evidence of agriculture.

The modern approach is more in the tradition of de Candolle (*8*) than Vavilov, in that it attempts to integrate all sources of information. A synthesis of the available evidence leads to a rather different pattern from that proposed by Vavilov.

The Near East Center

In the last 20 years, a large and impressive body of data has accumulated from archeological work and related studies. What appears to be emerging is a nuclear area that is definable, if not yet accurately defined, in terms of time and space. A sampling of sites of early farming villages has been excavated in the arc of hilly flanks from the Deh Luran Plain in Iran through southeast Turkey and south to the southern Jordan highlands (Fig. 3). Techniques and methodology are sufficiently sensitive that investigators can detect a phase in which wild cereals and wild pulses were harvested without any evidence of cultivation. At a later time, occasionally in the same sites, evidences of cultivated or semicultivated cereals and pulses appear (*9*). It seems that the actual time span required for domestication could be determined with reasonable accuracy. A sequence of genetic events associated with the evolution of some of the crops can also be detected (*10*).

While there is much detail to be learned, the general outlines of a nu-

The author is professor of plant genetics, Crop Evolution Laboratory, Department of Agronomy, University of Illinois, Urbana 61801.

clear area are beginning to take shape. Within this area, barley, einkorn, emmer, peas, lentils, flax, vetch, and chickpeas appear to have been domesticated, together with sheep, goats, pigs, and possibly cattle. As far as we know, plant and animal domestication were approximately synchronous. There are evidences that the nuclear area must be considered as a unit. Much local differentiation can be detected, but events that occurred in one part of the nuclear area seem to have affected other parts. A rather extensive trade in obsidian may have been one factor in lacing the area together (*11*).

The impression that there was a center is further amplified by the fact that one can trace the movement of various culture traits or of agriculture itself out of the area (*12*). Early agricultural sites seem to flow in a temporal sequence in all directions, across Anatolia to Greece, to North Africa, to Turkmenistan, up the Danube Valley, and down into the alluvium. It appears that all of the characteristics of a center can be established on archeological grounds alone.

The evidence of a center becomes even more impressive when the plant evidence is integrated with the archeological evidence. Recent studies on the distribution of the wild relatives of wheat and barley, as well as the distribution, ecological behavior, and genetic interaction of the weed races with the cultivated races, all support the idea of a center of agricultural origin (Fig. 4) (*13*). Even the evidence presented by H. E. Wright (*14*) that there had been a climatic change prior to the domestication of these plants finds support in the now disjunct distributions of spontaneous barley, einkorn, and emmer (*13*). The change in climate might or might not have something to do with stimulating the process of domestication, but it does not seem to alter appreciably the general pattern that is now emerging.

In short, all the evidence we can now muster indicates a nuclear area of plant and animal domestication that, as of about 7000 B.C., occupied the regions outlined in Figs. 3 and 4. The inadequacy of the Vavilovian method is shown by the fact that the barley of this region is not particularly variable, and the cultivated einkorn and emmer are hardly to be found at all. Einkorn is cultivated on a large scale in Turkish Thrace, but it is a very minor crop elsewhere. Most of the emmer grown today is found in such places as the

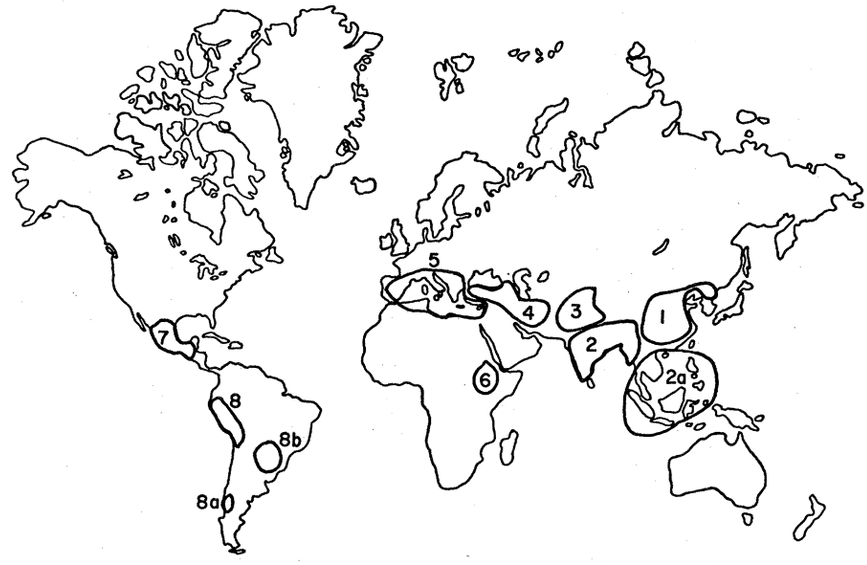

Fig. 1. The eight centers of origin, according to N. I. Vavilov.

U.S.S.R., Yugoslavia, Ethiopia, and South India. There is far more variation in both barley and emmer in Ethiopia than there is in their center of origin.

For centers of diversity to occur far from the center of origin is, in fact, a common pattern (*15*, *16*). However, crops do not necessarily develop centers of diversity—even when they are grown extensively in a region where other crops show such a pattern. P. F. Knowles (*17*) refers to "centers of similarity" as typical for safflower, even in Ethiopia. The fact that a crop can change drastically as it moves out of its area of origin led to the concept of diffuse origins, which I described some years ago (*18*). The crop as we now know it may be a far cry from that which started in the nuclear area. To say that "wheat" originated in the nuclear area which existed in 7000 B.C. would be misleading, to say the least. There is good evidence to suggest that hexaploid bread wheat originated outside of the nuclear area (*13*). To make any sensible statement about the place of origin of wheat, one would have to specify "what" wheat and "when." The famous Mexican wheats of Norman Borlaug originated in Mexico, not in the Near East nuclear area. Modern hybrid grain sorghums originated in the United States, not Africa.

While a center in which agriculture originated and out of which it was dis-

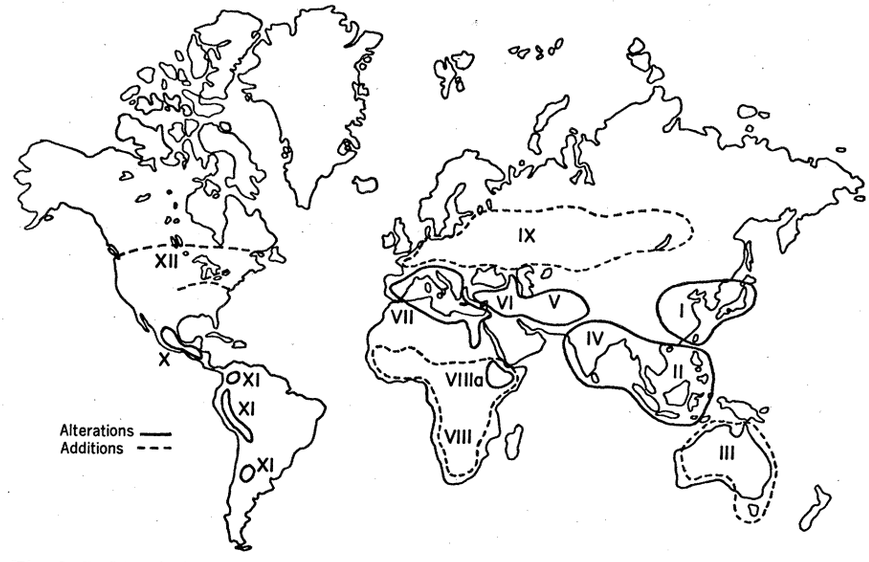

Fig. 2. P. M. Zhukovsky's alterations (solid lines) and additions (broken lines) to Vavilov.

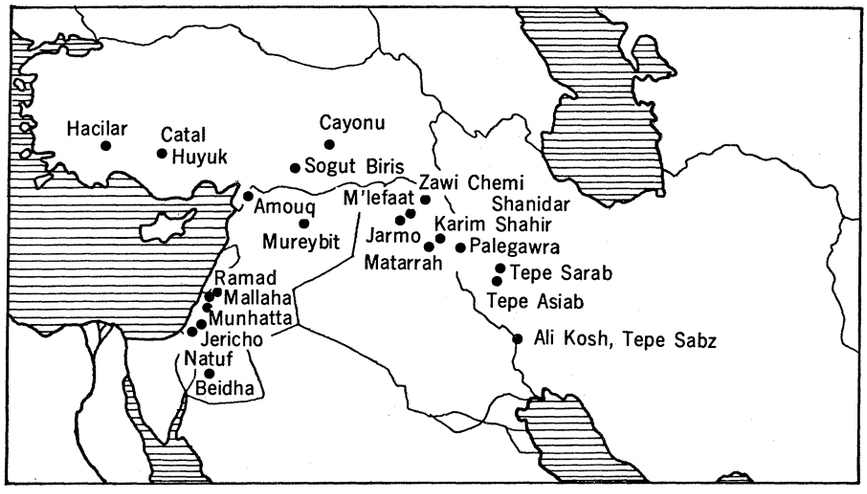

Fig. 3. Sites early farming villages from 7500 to 6500 B.C.

persed existed in the Near East, the modern crop derivatives are often strikingly different from the primitive races that had their beginnings there. The wild and weedy relatives are there, but most of the evolution of the crops took place elsewhere. As of 20 years ago, one could still detect microcenters, small geographic areas into which enormous variability is packed (*19*). These were scattered from Turkish Thrace to the Caucasus (*20*), parts of Iran (*21*), and Afghanistan (*22*). Some of them have been wiped out, and the rest are threatened by replacement with modern varieties. Nearly all of the microcenters were located outside of the nuclear area, and the source of variation is attributed to current evolutionary activity rather than to any relationship to place of origin.

Africa

The evidence from Africa is of a different order than that from the Near East. Very few excavations have been made of sites representing the appropriate time range; many deal with early man, and others with late iron-age sites. Rather extensive surveys have been made and a substantial number of carbon-14 dates have been obtained. These tell us that "Neolithic" cultures ranged widely over the Sahara in the fourth millennium B.C. and earlier, when the rainfall was greater than it is now and the flora was largely Mediterranean in nature (*23*). In the third millennium B.C., a progressive desiccation of the Sahara is demonstrable, and there are tenuous evidences suggesting that agriculture had become established in the savanna zone stretching from the Atlantic to the Lake Chad region. The archeological surveys indicate that agriculture was developed much later south of the equator. The archeobotanical evidence for plant domestication is essentially nil at the present time, and most of our evidence for Africa must come from the plants themselves.

The plant evidence, first of all, reveals a rather impressive list of cultigens (Table 1), including sorghum, one of the four major cereals of the world. These plants were domesticated by Africans in Africa and provided an adequate base for a widespread development of sedentary agriculture. The high cultural levels of Nok, Ife, Benin, and the Sudanic kingdoms were supported by an indigenous African agriculture. This fact has been established; the time range remains to be determined by archeological research. For the time being, the locale of domestication must

Table 1. Short list of African domesticates and probable areas of domestication.

Crop	Area of domestication
Cereals	
Brachiaria deflexa (a millet)	Guinea
Digitaria exilis (fonio)	Senegal to Cameroun
Digitaria iburua (black fonio)	Togo and Nigeria
Eleusine coracana (finger millet)	Highlands, Ethiopia to Uganda
Eragrostis tef (tef)	Ethiopia
Pennisetum americanum (pearl millet)	Dry savanna, Sudan to Senegal
Sorghum bicolor (sorghum)	Broad-leaved savanna, Sudan and Chad
Pulses	
Kerstingiella geocarpa (a groundnut)	Nigeria and Cameroun
Vigna unguiculata (cowpea)	Nigeria
Voandzeia subterranea (a groundnut)	Nigeria and Cameroun
Tubers	
Dioscorea rotundata (yam)	Ivory Coast to Cameroun
Dioscorea spp. (yams)	Forest zones, Sierra Leone to Congo
Plectranthus esculentus (kafir potato)	Guinea to Togo
Tubers (continued)	
Sphenostylis stenocarpa (yampea)	Nigeria to Guinea
Solenostemon rotundifolius (piasa)	Guinea to Togo
Oil-yielding	
Balanites aegyptica (desert date)	Sudan to Senegal
Butyrospermum paradoxum (karité)	Nigeria to Senegal
Elaeis guineensis (oil palm)	Wet forest, Sierra Leone to Congo
Guizotia abyssinica (noog)	Ethiopia
Telfairia occidentalis (a gourd)	Forest zone, West Africa
Others	
Abelmoschus esculentus (okra)	Savanna zones, West Africa
Adansonia digitata (boabab)	Sudan to Senegal
Caffea arabica (coffee)	Ethiopia
Catha edulis (chat)	Ethiopia
Colocynthis citrullus (watermelon)	Sudan (wild races widespread)
Gossypium herbaceum (cotton)	Sudan, origin in doubt
Musa ensete (ensete)	Ethiopia

be determined by the patterns of distribution and variation of the several crops.

Some African domesticates appear to be Ethiopian in origin (*15*). *Musa ensete* is widespread in Africa as a wild plant, ranging from Ethiopia to Angola and the Cameroun, but it is an important crop only in Ethiopia. Noog (*Guizotia abyssinica*) is a major crop only in Ethiopia, where the complete range of wild, weed, and cultivated races are found in great abundance. Tef (*Eragrostis tef*) is grown on a very large scale in Ethiopia, but almost nowhere else. The range of wild and weed forms is not known, although tef appears to have become naturalized in parts of South Africa. Chat and *arabica* coffee are also important Ethiopian domesticates.

Other African crops appear to be West African in origin. The *Brachiaria* millet is grown only in Guinea; glaberrima (African) rice is (or was) grown from Senegal to Chad, but the older areas of culture are clearly in the Bend of the Niger, the Casamance, and Guinea (*24*). The *Digitaria* millets, African yams, and cowpeas appear to have originated in the zone from the Ivory Coast to Cameroun (*25*). The groundnuts *Voandzeia* and *Kerstingiella* are known to grow wild only in the area of the Nigeria-Cameroun border (*26*), although they may grow wild elsewhere as well.

It is not possible to locate a "center" for sorghum domestication (*27*) on the basis of botanical evidence alone. The wild races are widespread and often extremely abundant. My present understanding, based on patterns of variation and genetic interaction among wild, weed, and cultivated races, would suggest a wide zone in the broad-leaved savanna belt that stretches from about Lake Chad to eastern central Sudan. Vast amounts of truly wild sorghum are found along the Sudan-Ethiopia border, but there is no indication that the area was ever farmed before government settlement projects were established. Variations in sorghum do not suggest that its homeland is Ethiopia; by far the bulk of Ethiopian sorghums are durras, which are the most specialized and derived of cultivated sorghum.

As for pearl millet, the evidence suggests an even longer zone in the drier savanna, from the Nile to Senegal and Mauritania. The most conspicuous areas of interaction among the cultivated and the wild and weedy races are near Jebel Marra in the western Sudan

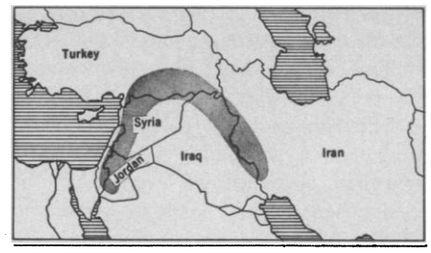

Fig. 4. Concentration of wild races of barley, emmer, and einkorn.

and in Senegal. The significance of this is not yet established.

Evidence from other crops simply reinforces the impression that domestication took place south of the Sahara and north of the equator, from Cape Vert to the Horn (Fig. 5). There is no "center," unless you wish to refer to something 7000 kilometers across as a center. This would seem to distort the idea of a center beyond utility. The pattern is no pattern. For want of a better name, I refer to this vast area as a noncenter. To be sure, some minor crops were domesticated locally and never spread much, and a few have a demonstrable nuclear area from which they were dispersed. But a center must be established one crop at a time, and there is no evidence in Africa for a center in which agriculture originated; nor is there evidence for the kind of center described by Vavilov, in which dozens of crops originated.

The integrated evidence so far available indicates a center in the Near East and a noncenter in Africa. What about the situation in the rest of the world?

Far East

A considerable amount of archeological work has been done in China (*28*, *29*). The pattern that emerges with respect to prehistoric agriculture is reasonably clear and shows a distinct nuclear area that can be defined in time and space. At present, it is much more clearly defined in space than in time because there is no carbon-14 date for

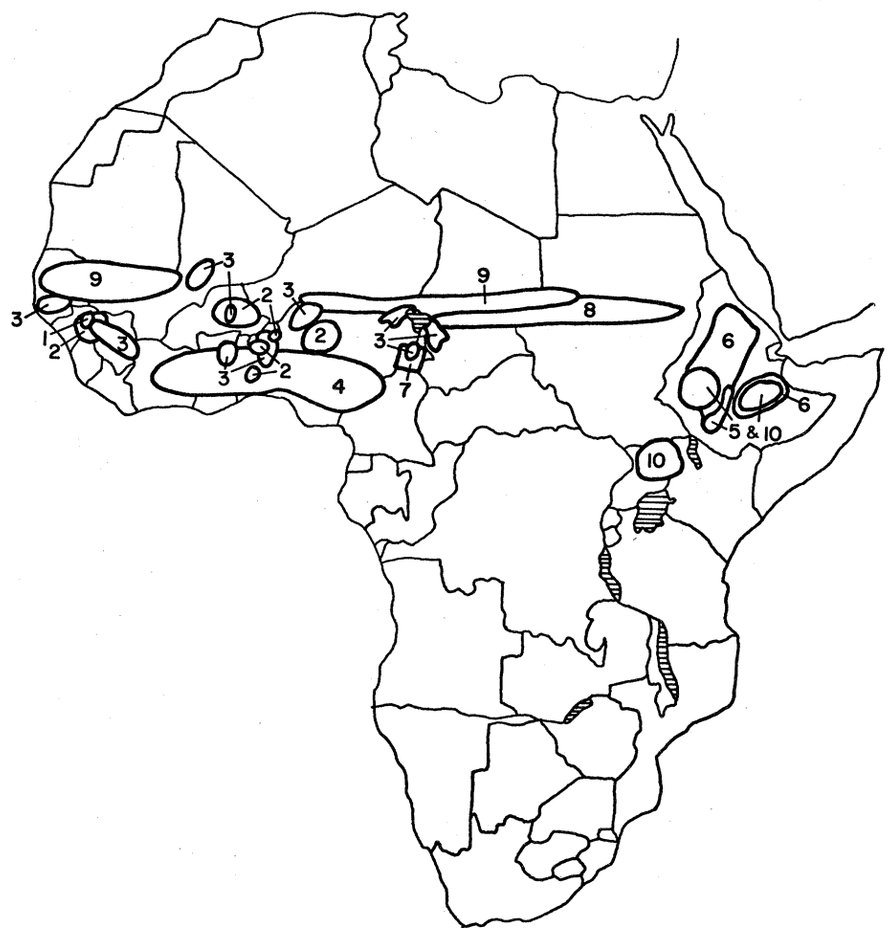

Fig. 5. Probable areas of domestication of selected African crops: 1, *Brachiaria deflexa*; 2, *Digitaria exilis* and *Digitaria iburua*; 3, *Oryza glaberrima*; 4, *Dioscorea rotundata*; 5, *Musa ensete* and *Guizotia abyssinica*; 6, *Eragrostis tef*; 7, *Voandzeia* and *Kerstingiella*; 8, *Sorghum bicolor*; 9, *Pennisetum americanum*; 10, *Eleusine coracana*.

mainland China. That there was a center out of which things were dispersed is clearly shown by P. T. Ho (*30, 31*). Not only cultivated plants, but the techniques of field agriculture, animal husbandry, pottery styles, bronze metallurgy, writing, the concept of numerals, and many other culture traits originated within the center and were dispersed outward from it. The center was indigenous, endemic, and strictly Chinese. No appreciable influence from outside is detectable until about 1300 B.C. (*30, 31*).

The antiquity of the center is not known, but reasonable estimates put it in the fourth millennium B.C., if not earlier. The Yang-shao is the earliest farming culture known in China, but the size of the villages, the elegance of pottery styles, the size of the buildings, and the apparent social stratification suggest that there may have been a considerable period during which agriculture evolved before the emergence of Yang-shao.

In any case, the Yang-shao center appears to be real, and the data to document it are convincing. However, Southeast Asia and the South Pacific are a different story altogether. The number of domesticates is impressive, and the area covered, immense. Plant domestication activities seem to have stretched from eastern India across Burma, Indochina, South China, Indonesia, the Philippines, Borneo, and New Guinea, extending perhaps to the Solomon Islands and New Caledonia. Different crops were introduced into cultivation in different areas at different times, over an area some 10,000 kilometers across and probably over a period of some millennia.

The banana is, perhaps, a good example, since polyploidy is involved and a rough sequence of events can be established. Wild bananas were, no doubt, used whenever sympatric with man, but one of the first steps in domestication was the establishment of the parthenocarpic, seedless diploids *Musa acuminata* (AA). These had to be propagated vegetatively and were consequently dependent on man. They occur primarily in Indochina, Thailand, and Malaya (*32*). A second step in domestication involved the production of triploids and tetraploids, involving either *M. acuminata* alone (AAA, AAAA), or in such combinations with *M. balbisiana* (BB) as AAB, ABB, and AABB. Such derivatives were produced on each side of the zone in which the diploid *M. acuminata* was grown, from East India and Burma on the west to the Philippines and Borneo on the east. Again, the principle of diffuse origins prevails, and a true "center" is not definable.

To the east of this area, the fe'i bananas of the Australomusa group were domesticated in the New Guinea–Solomon Islands area. They were eventually taken by Polynesians as far away as Hawaii, the Marquesas, and Mangareva. On Tahiti, they became naturalized as part of the forest vegetation. The fe'i bananas have seeds and are quite different in appearance from the true bananas and plantains.

Fig. 6. Centers and noncenters of agricultural origins. (A1, Near East center; A2, African noncenter; B1, North Chinese center; B2, Southeast Asian and South Pacific noncenter; C1, Mesoamerican center; C2, South American noncenter.)

Taro, was, perhaps, domesticated in Burma (*33*), sugarcane in New Guinea (*34*), tung and many citrus in South China and Indochina, and the coconut anywhere, or perhaps everywhere, along the shores of this vast region. A crop by crop analysis in which all available information is used simply reinforces the impression of a noncenter rather than a center (*35*).

Archeological information is meager, to say the least. Claims that agriculture existed in ancient Thailand have been made, but on evidence of unacceptable quality (*36*). The grand diffusionist theory of C. O. Sauer (*37*) is well known and would make this part of the world the hearth for all Old World agriculture. Preliminary work in Oceania is beginning to reveal a temporal sequence of diffusion out of the noncenter (*38*), but adequate dating for the noncenter is lacking. As of now, we can say very little about when agriculture was developed in the region.

The New World

The general pattern may be repeated in the New World. The archeological evidence for Mesoamerica is relatively good and getting better. Once again, we have the suggestion of a center which is definable in time and space, in which agriculture originated, and out of which it was dispersed (*39*). Mesoamerica has all the characteristics of a center of agricultural origin, including an impressive list of domesticated plants.

South America, on the other hand, tends to resemble a noncenter more than a center. Wild peanut (*40*) and wild *Ullucus* (*41*) are found in Jujuy and the adjacent, mountainous portion of Bolivia. Wild beans stretch for 5000 kilometers, from Argentina to Venezuela, and Brücher (*42*) has demonstrated that different races of beans were domesticated at different places and at different times along this distribution. H. S. Gentry (*43*) has demonstrated another area of bean domestication in Mexico. Bean domestication seems to have taken place along a band 7000 kilometers long. How can one speak of a "center of origin" for *Phaseolus vulgaris* (the common bean)? Its domestication was not even confined to one continent. Sometimes centers exist, sometimes they do not.

Most of the activity in South America would appear to have been along or near the Andes, whether in

the highlands, intermediate zones, or lowlands. Yet D. J. Rogers (*44*) places one area of cassava domestication in the dry, northeast Brazil, and the wild *Cucurbita maxima* is native to the Argentine plains. The South American Indians were domesticating plants over almost all of the continent, and, if there are centers at all, they have not been convincingly defined (*45*).

One of the most characteristic features of American plant domestication is the parallel, pointed out by C. B. Heiser (*46*), between the Mesoamerican center and the South American noncenter. Genera in which vicarious species were domesticated in the two regions include: *Amaranthus, Annona, Canavalia, Capsicum, Carica, Chenopodium, Cucurbita Gossypium, Opuntia, Pachyrrhizus,* and *Physalis*. Possible independent domestications include common bean, lima bean, cassava, avocado, and sweet potato. According to Heiser (*46*), there are no clear traces of contact between the center and the noncenter until rather late.

Systems of Centers and Noncenters

If the picture I am describing is reasonably close to the real situation, what are we dealing with? Is this a pattern of temperate centers and tropical noncenters? Do people behave differently in tropics than in more temperate zones? Is this a cleavage between seed agriculture and root and tree agriculture? Is the pattern a reflection of the distribution of our ignorance? Do we have centers in those areas where substantial information is available and noncenters in those areas where we know too little? Or are we dealing with three independent systems, each including a center and a noncenter, with interaction between the center and noncenter in each case (Fig. 6)?

For the Near East center–African noncenter, there is a tenuous archeological suggestion of cross-stimulation. F. Wendorf (*47*) and others have found on Nile terraces grinding equipment that has been dated some 12,000 years or so B.C. This is earlier than any grinding equipment that has been found in the Near East center. Is it possible that people along the Nile had learned about harvesting grass seeds in volume and about grinding them with stone implements? Is it possible that this technique of hunter-gatherers was transferred to the Near East center, where wild wheat and barley were enormously abundant and these plants were subsequently domesticated (*48*)? Is it possible that the idea of plant domestication was then returned to Africa, where the unique domesticates were developed? In other words, was there a transfer of ideas from Africa to the Near East center and back to Africa?

K. C. Chang (*29*) has suggested something of the sort for the Far East. Ho (*30*) thought perhaps the Yang-shao people came from the south. Were the people in the south already growing some kinds of crops? Did the Yang-shao domesticate cereals, spread the idea southward in early Lungshanoid times, induce the southerners to domesticate rice that spread back northward during the period of the Lungshanoid cultures? Too little is known and too little evidence exists in the Far East to answer these questions at present, but a significant interaction between the Chinese center and the Southeast Asian noncenter is a possibility.

In nuclear America, information is somewhat better. Developments in the Mesoamerican center and South American noncenter were parallel in many respects, and demonstrable contacts developed in due time. Eventually, maize moved southward, and the peanut, tobacco, and pineapple moved northward (*46*). These contacts were demonstrably late, but this does not mean that earlier contacts were not effective in stimulating developments in both the center and noncenter.

Summary

I propose the theory that agriculture originated independently in three different areas and that, in each case, there was a system composed of a center of origin and a noncenter, in which activities of domestication were dispersed over a span of 5,000 to 10,000 kilometers. One system includes a definable Near East center and a noncenter in Africa; another system includes a North Chinese center and a noncenter in Southeast Asia and the South Pacific; the third system includes a Mesoamerican center and a South American noncenter. There are suggestions that, in each case, the center and noncenter interact with each other. Crops did not necessarily originate in centers (in any conventional concept of the term), nor did agriculture necessarily develop in a geographical "center."

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Equinoxial Rites of the National Research Council

Walter Goldschmidt

Sirs:

In accordance with instructions from the elders of our lineage (the Executive Board of the American Anthropological Association), I proceeded to the banks of the Potomac River at the site called Washington, D.C., on 17 March 1971. My task was to observe the ritual activities attendant upon the ingathering of the diverse clans and lineages in that loose but powerful tribe known as the National Research Council (NRC), of which our lineage (anthropology) is a small and often neglected member. Thanks to the power of the theoretical perspective that our lineage has attained, I believe that I can provide some understanding of the nature and purpose of these ceremonies, known to member clans and lineages as the "annual meeting." Let me say that my understanding is based on the classical discussion of the Intichiuma Ceremonies of the Australian Aborigines (the precise reference for which is not at hand) and that I am tempted to paraphrase that great leader of my state: "If you have seen one Intichiuma Ceremony, you have seen them all."

It is my conviction that the primary purpose of this spring festival is the reaffirmation of the unity and loyalty of the several clans and lineages of which the NRC is constituted, as well as the reaffirmation of the structural relationships of these several entities, providing, in Malinowski's classic formulation, a "charter" for the established patterns of action. The very structure of the ritual provides us with an example of this. The first evening was devoted to a period of libation and commensality for the entire tribe; the second, to a similar ritual for each of the several clans (I, naturally, attended the ritual for the behavioral sciences). The lavishness of the libations and feasts gave evidence of continuing tribal and lineal solidarity in the face of those external threats that were expressed in subsequent litanies. The major ceremonials likewise reflected this segmental system, with two periods devoted to the tribe as a whole and two to each clan, or (following Evans-Pritchard) the maximal lineage.

The larger rituals were devoted to discourse on the threats against the tribe posed by changing ecological circumstances, though not until after a repository of clan lore (of a kind known as an historian of science), recounting earlier times and conditions of tribal history, assured the gathering that crises of the kind presently encountered had been weathered on various occasions over the past century and a half. The closing ceremony of the tribe involved presentation of the elders of each maximal lineage, together with ritualized discourse (formally called "resolutions") that was manifestly designed to ward off evil forces in the environment and that certainly had the latent function of reinforcing the sense of tribal solidarity.

The rituals involving our own maximal lineage seemed to me to be more revealing. Aside from the period of libation and feasting already noted, there were two gatherings. In the first of these, the elders of our lineage were arranged at the front, facing the ordinary members, the differences in their status being further symbolized by large placards bearing their names. (The "ordinaries," as I shall call those who were not elders, had their names emblazoned on their breasts in symbols too small to be clearly differentiable except by close scrutiny.)

It appeared at the outset that none present seemed to know the purpose of the rites, or clearly how to conduct them, and diverse persons, both elders and ordinaries, spoke briefly. Though, as you know, I believe it is very important to record the details of such discourse (see my "Ethnography of Encounters," *Current Anthropology*, in press), it was not possible for me to record such details. Some important generalizations can nevertheless be made. The fact that all the discourse dealt with procedural rather than substantive matters was given dramatic force by the breach of what appears to be a strong tabu. This occurred when one speaker (an "ordinary," of course) used the word "problem," and another used the word "crisis." Both speakers were covered with embarrassment at this lapse of etiquette, and they subsequently were at pains to assure the group that they had not intended to use such terms. Though it was not possible to discover what "problems" or "crises" the speakers were referring to, it was plain that no discourse directed

The author is professor of anthropology at the University of California, Los Angeles 90024, and represented the American Anthropological Association at the National Research Council's annual meeting in March 1971.