

DET KGL. DANSKE VIDENSKABERNES SELSKAB  
HISTORISK-FILOLOGISKE MEDDELELSER, BIND XXIX, NR. 3

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# THE ORIGIN OF MAIZE CULTIVATION

BY

KAJ BIRKET-SMITH



KØBENHAVN

I KOMMISSION HOS EJNAR MUNKSGAARD

1943



Det Kgl. Danske Videnskabernes Selskabs Publikationer i 8<sup>vo</sup>:

Oversigt over Selskabets Virksomhed,  
Historisk-filologiske Meddelelser,  
Arkæologisk-kunsthistoriske Meddelelser,  
Filosofiske Meddelelser,  
Matematisk-fysiske Meddelelser,  
Biologiske Meddelelser.

Selskabet udgiver desuden efter Behov i 4<sup>to</sup> Skrifter med samme  
Underinddeling som i Meddelelser.

Selskabets Adresse: Dantes Plads 35, København V.

Selskabets Kommissionær: *Ejnar Munksgaard*, Nørregade 6,  
København K.

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Printed in Denmark  
Bianco Lunos Bogtrykkeri A/S



## INTRODUCTION

Next to wheat and rice, maize is the most important of all cereals. In America it formed the basis of pre-Columbian agriculture from Chile in the South to the region of the Great Lakes in the North. If we were able to clear up the origin of maize cultivation, we might be certain that a long step had been taken towards the elucidation of the early history of aboriginal American agriculture and thus also an essential part of the history of American civilization as a whole. For a considerable time it has been taken for granted that México was the original home of maize, but lately this view has been contradicted by two American botanists who, instead, have revived the old idea that maize spread from Paraguay<sup>1</sup>. This means not only a complete revolution of everything we have so far supposed we knew, but it also raises very great ethnological and archaeological difficulties. There is every reason, therefore, to take up the investigation of the problem from an ethnological point of view. The present work should be read as a contribution in this direction.

Maize is supposed to constitute a single Linnean species, *Zea mays*. There are, however, innumerable varieties — at a reasonable estimate more than 8000 — most of which are comprised within a few main groups: dent (*Z. m. indentata*), flint (*Z. m. indurata*), flour (*Z. m. amyleacea*), pop (*Z. m. everta*), and sweet (*Z. m. saccharata*)<sup>2</sup>. More than 97 p. c. of the entire world output of maize is referred to the three first-mentioned types which, consequently, are by far the most important from an economic point of view<sup>3</sup>. In addition there are still other types, of which pod corn (*Z. m. tunicata*) calls for special attention. In contradistinction to all other varieties it has the grain pro-

<sup>1</sup> MANGELSDORF & REEVES 1939, 248 seqq.

<sup>2</sup> Ibid. 7.

<sup>3</sup> HURLUM 1942, 12.

ted by glumes, and for this reason, as well as for others, it is generally supposed to be the most primitive form of maize<sup>1</sup>.

Characteristic of the species as a whole is the great transformation which the plant must have undergone since its domestication. As early an author as ALPH. DE CANDOLLE calls it "*une plante singulièrement dépourvue de moyens de dispersion et de protection*"<sup>2</sup>. HARSHBERGER expresses the same opinion in these words: "The cultivated forms would disappear, if man did not sow the kernels, for the grain is too large to be carried by the winds, and the sheathing husks prevent animals from reaching the ripened achenes"<sup>3</sup>. These facts have been interpreted as evidence of the high antiquity of maize cultivation. According to the latest botanical investigations it seems doubtful whether this view holds true. We shall return to the point on a later occasion.

Cultivated maize is the only species within the genus *Zea*. Other species are not known, any more than wild forms of maize itself. In America there are only two genera closely related to maize, *Euchlaena* and *Tripsacum*. The former comprises two species, *E. mexicana* and *E. perennis*, the last-mentioned of which is limited to the state of Jalisco in México, whereas the former is of common occurrence from southern Chihuahua to the southern boundary of Guatemala. It was called *teocentli*, i. e. sacred or divine maize, by the Aztec and has played a considerable part in the discussion as the possible progenitor of the cultivated cereal. *Tripsacum* or Gama grass is represented by no less than six different species. One of them is found growing over great parts of North as well as South America, while the others occur exclusively within the tropical and subtropical regions of the New World.

<sup>1</sup> MANGELSDORF & REEVES 1939, 222, 230 seqq. In contradistinction to this view KEMPTON (1938, 400) emphasizes that pod corn is as a rule sterile and can only propagate through hybridization. Cf. also DARWIN 1893, 339 and COLLINS 1920, 504 seq. BUKASOV (1930, 33, 472) regards flour corn as the most primitive type.

<sup>2</sup> A. DE CANDOLLE 1883, 317.

<sup>3</sup> HARSHBERGER 1893, 78. Cf. KEMPTON 1938, 390.

## PREVIOUS VIEWS

The first author to express an opinion on the origin of maize seems to have been the famous French naturalist AUGUSTE DE SAINT-HILAIRE. He was also the first to give a clear description of pod corn, although it was probably observed as early as the 17th century. As the wording of his remarks has a certain importance I cite them here verbatim: "*Quelque temps après mon retour du Brésil, M. l'abbé Damasio Larranhaga de Montevideo . . . m'envoya une portion d'épi d'une espèce de Maïs, qu'il avait étiqueté Zea Mais var. tunicata, et qu'il me disait être cultivée par les Indiens Guaycurus . . . Quant à l'assertion de M. Larranhaga sur l'origine de ce Maïs, il était bien évident qu'elle était erronée. En effet, les Indiens Guaycurus, placés très-bas dans l'échelle de la civilisation, restent étrangers à la culture des terres; ils sont un objet de mépris pour les Indiens civilisés, et j'ai vu, dans mon voyage, prendre le nom de Guaycuru pour synonyme de notre mot sauvage . . . Je fit voir le fragment que j'avais reçu de M. Larranhaga à un Guarany que j'avais amené en France, le jeune Diogo, qui bien certainement était né dans quelque partie de l'ancien Paraguay, et assez probablement dans le nord de l'Enterior, ou dans les états du docteur Francia [i. e. the present republic of Paraguay]. Ce jeune homme reconnut le Maïs que je lui présentais comme appartenant à son pays, et il ajouta qu'il y croissait dans les forêts humides . . . Je crois donc que, de tout ceci, on peut conclure que le Maïs est originaire du Paraguay. . . .*"<sup>1</sup> The view of DE SAINT-HILAIRE is the same as that set forth by MANGELSDORF and REEVES, for which reason I shall postpone further discussion till later. However, as DE SAINT-HILAIRE is sometimes cited as if he had stated that pod corn grew wild in Paraguay, it

<sup>1</sup> A. DE SAINT-HILAIRE 1829, 144 seq.



should be emphasized that this is by no means implied in his words. Others also have called attention to this fact<sup>1</sup>.

In his great work on cultivated plants DE CANDOLLE does not share the opinion of DE SAINT-HILAIRE. As maize is an annual, he is convinced that it cannot originate from the Amazon area or the forests of Paraguay. He shows, however, that pre-Columbian agriculture had attained its climax in México and Perú, but since the Indians of these regions were without mutual contact, he concludes that it spread from an intermediate area, i. e. Colombia<sup>2</sup>. It need hardly be pointed out that this is a rather slender proof of a hypothesis of so far reaching consequences. DARWIN subscribes to the idea of DE CANDOLLE as far as the American origin of Maize is concerned and mentions some of his own observations in support of the high antiquity of maize cultivation in South America<sup>3</sup>. On the other hand, I fail to see that he should have maintained the South American origin of the cultivation as asserted by MANGELSDORF and REEVES<sup>4</sup>.

In modern times México has decidedly taken the lead in the discussion concerning the home of maize. Originally HARSHBERGER regarded the so-called *Zea canina* in México as the wild progenitor of the cultivated plant, inferring that it belonged to the highlands north of the Isthmus of Tehuantepec. True, he had to admit later on that the supposed "progenitor" was nothing but a hybrid between common corn and *Euchlaena*. On the other hand, the facility with which these plants were crossed was a proof of such close relationship that it naturally led him to consider *Euchlaena* itself as the sought-for progenitor<sup>5</sup>. Many years later Miss ZELIA NUTTALL, the well-known archaeologist, brought to light some remarks by the Italian naturalist BOTURINI, according to which wild corn was growing in México as late as the 18th century. In his work *Idea de una nueva historia de la América Septentrional*, published in Madrid 1746, BOTURINI says as follows: "*Hallé yo en la Nueva España un maíz silvestre,*

<sup>1</sup> COLLINS 1920, 504. MANGELSDORF & REEVES 1939, 226.

<sup>2</sup> A. DE CANDOLLE 1883, 318.

<sup>3</sup> DARWIN 1893, 338 seq.

<sup>4</sup> MANGELSDORF & REEVES 1939, 67.

<sup>5</sup> HARSHBERGER cited by MANGELSDORF & REEVES 1939, 66 seq. Cf. KEMPTON 1938, 392.

*que nace entre bosques especialmente de tierras calientes, de chica mazorca, cuyos pocos granos son de sabor más delicado que el cultivado, como que coloca en ellos la naturaleza en compendio toda la sustancia*"<sup>1</sup>. Miss NUTTALL believes that wild corn disappeared later as a consequence of the increasing cultivation of the country. There is reason, however, for questioning the correctness of her view, as well as of BOTURINI'S find on the whole<sup>2</sup>. Nevertheless México was still regarded as the home of the maize plant. VAVILOV, for instance, takes this for granted<sup>3</sup>.

The circumstance that it seemed to agree so well with the archaeological facts was not the meanest support of this hypothesis. Southern México and Guatemala were the home of what was, perhaps, the most highly developed civilization in America before Columbus. It was therefore an obvious conclusion to regard it as the oldest. SPINDEN'S famous theory of a general, archaic culture comprising México and Central America with ramifications as far as Perú and the Amazon area<sup>4</sup>, was based on the supposition that maize cultivation spread from México.

Still it could not be denied that certain facts did not fit into the scheme. Without mentioning maize particularly, Cook called attention to the extremely favourable conditions offered by Perú as a centre of plant domestication as compared with México<sup>5</sup>. KEMPTON emphasized that the greatest number of varieties of maize are to be found in Perú, and such variability is, as a rule, a characteristic of the regions to which the plant in question belongs. If nevertheless he gives preference to México as the home of maize, it is wholly because no closely related species are known from Perú<sup>6</sup>. According to YUZEPCHUK, maize was introduced into Perú from Paraguay or Brazil; he believes that both of these countries might claim to be the homeland of maize, if we had only sufficient material from there<sup>7</sup>.

Besides, an ever increasing number of archaeological inves-

<sup>1</sup> NUTTALL 1927, 253.

<sup>2</sup> MANGELSDORF & REEVES 1939, 67.

<sup>3</sup> VAVILOV 1931, 183, 195, 198 seq.

<sup>4</sup> SPINDEN 1922, 43 seqq.

<sup>5</sup> COOK 1925, 101.

<sup>6</sup> KEMPTON 1926, 38. Eiusd. 1938, 394 seq.

<sup>7</sup> BUKASOV 1930, 33 seq., 472. I have not had access to the original work of YUZEPCHUK and therefore I do not know whether he supports his view by new observations or whether it is nothing but an echo of DE SAINT-HILAIRE.

tigations go to show that SPINDEN's great and simple idea of a basic, archaic civilization comprising México, Central America and Northern South America can no longer be maintained. The archaic culture of México is neither so primitive nor so old as it must necessarily be, if SPINDEN's view were correct; this is true even of its earliest phase, the Zacatenco culture, which hardly goes farther back in time than the 3rd century B. C.<sup>1</sup>. Moreover, it seems to disappear, at least as a type, as soon as the Maya area is reached. The pre-Mayan culture, known for instance from the finds at Uaxactún and Holmul, shows a much closer affinity to southern culture types in Central America than to that of México<sup>2</sup>. In Nicaragua and Costa Rica, not to mention South America, the characteristic archaic figurines are entirely absent<sup>3</sup>. On the other hand, LOTHROP strongly emphasizes the connection of pre-Mayan and Chorotegan culture with that of South America<sup>4</sup>. The primitive culture of the Bay Islands in Honduras, which is probably due to the Jicaque or Paya, points in the same direction<sup>5</sup>. How much more easy to understand would the early culture of these regions be, if maize came from South America, exclaims KIDDER<sup>6</sup>.

SAUER believes that there are "as many American centers of plant domestication as there are domesticated starch plants"<sup>7</sup>. Even though GLADWIN sympathizes with the hypothesis<sup>8</sup>, he will probably not find many followers. Of more importance are his objections to the theory of SPINDEN regarding the development of American agriculture, and especially of maize cultivation, in arid lands in connection with irrigation<sup>9</sup>. In that case the earliest traces of agriculture might be expected to be found in places like the Southwestern United States, the deserts of Sonora, or the Peruvian coast land. In all these regions, however, civilization seems to have been introduced from without. More-

<sup>1</sup> VAILLANT 1930, 77. Eiusd. 1935, 258. Cf. also LOTHROP 1926, 401.

<sup>2</sup> VAILLANT 1930 a, 79 seq. MERWIN & VAILLANT 1932, 93, 96.

<sup>3</sup> LOTHROP 1926, 402 seq.

<sup>4</sup> LOTHROP 1921, 316 seqq. Eiusd. 1926, 409 seqq. SPINDEN maintains the view that Chorotegan culture "was built historically on Mayan ideas of the First Empire". (SPINDEN 1925, 529).

<sup>5</sup> STRONG 1935, 170 seq. Cf. CONZEMIOUS 1928, 68.

<sup>6</sup> KIDDER 1936, 150.

<sup>7</sup> SAUER 1936, 291 seqq.

<sup>8</sup> GLADWIN 1937, 78 seq.

<sup>9</sup> SAUER 1936, 279, 285 seqq.



over, all cultivated plants of aboriginal America appear to be adapted to fairly moist conditions. Contrary to those of the Old World they are rather susceptible to alkaline soil and, with the sole exception of the potato, all demand a warm germination period, abundant summer rain, and a dry harvest season with somewhat decreasing temperature.

It is obvious that there is no lack of difficulties in fixing upon México as the primeval centre of maize cultivation. Nevertheless this view seemed indisputable as long as *Euchlaena* was regarded as the progenitor of corn. However, after the pioneer investigations of MANGELSDORF and REEVES this apparently incontestable fact has now proved entirely groundless. They have succeeded in showing that *Euchlaena* is entirely out of the question as the progenitor, since it came into existence itself as a cross between *Zea* and *Tripsacum pilosum* or *T. laxum*, more probably the former<sup>1</sup>. In addition, a great number of maize varieties, i. a. the wide-spread dent corn, arose by the re-crossing of *Euchlaena* and *Zea*, which in this way acquired many valuable qualities tending towards hardiness to the climate and insect pests. With a few exceptions these new varieties are the only ones to be found throughout North and Central America, and from here they have spread to large parts of South America. Pure maize without *Tripsacum* contamination occurs almost exclusively in South America<sup>2</sup>. Evidently the great variability of corn is not due to its high age as a cultivated plant, but to its history. As only a single genus has arisen through the crossing of *Zea* and *Tripsacum*, the authors infer that they came into contact at a rather late period, perhaps not till the fall of the Maya Early Empire in the 9th century A. D.<sup>3</sup>

In conformity to these assumptions they entirely reject the idea of maize having spread from México and Central America, and revert to the old hypothesis of its South American origin. Although the great number of pure maize varieties in the Andean area characterizes the highlands as "the primary centre of domestication", it does not follow that it belongs to these regions from the beginning. They take it for granted that the wild plant

<sup>1</sup> MANGELSDORF & REEVES 1939, 217.

<sup>2</sup> Ibid. 252 seqq.

<sup>3</sup> Ibid. 220 seq., 241 seq.

required heat, moisture, and fertile soil such as are found in the lowlands outside the tropical rain forest. In this connection they recall the early reports of pod corn in Paraguay. "All of this suggests that the search for wild corn should be directed to the lowlands of Paraguay, Northeastern Bolivia, or Southwestern Brazil." And they add: "Since the Andean region obtained its mandioc, sweet potatoes and several other important crop plants from the lowlands, it is not difficult to imagine that maize travelled the same paths"<sup>1</sup>.

In his great and valuable work on the geography of maize cultivation, HUMLUM subscribes in every detail to the opinions of MANGELSDORF and REEVES. As a further support of their hypothesis he mentions that HARSHBERGER believes he has found Peruvian loan words for maize among the Indians of El Gran Chaco, but, he adds, probably they have travelled in the opposite direction, so that the Peruvians adopted the words from the Chaco at the same time as they obtained the plant<sup>2</sup>.

Even though there can scarcely be any doubt as to the results of MANGELSDORF and REEVES concerning the origin of *Euchlaena* and the extremely great importance of hybridization in the development of maize varieties, serious objections may well be raised against some of their conclusions. Their main points are as follows: (1) pod corn is the most primitive variety of maize; (2) as pure varieties are found practically nowhere outside South America, maize must belong to this continent; (3) as the most primitive variety grows in Paraguay and possibly adjacent regions, and (4) as conditions here correspond to those which, theoretically, the wild plant must be expected to require, it must have spread from that region.

It is the two latter points which, according to my judgment, are open to criticism. Methodically it is an unfounded supposition that a cultural element, in this case maize, should belong to the area where the most primitive types occur. On the contrary, ethnology shows us over and over again that the primary forms are found farthest away from the centre of diffusion, in the peripheral areas, to which they have been dispelled by later and more appropriate types. Moreover, Paraguay is far from

<sup>1</sup> MANGELSDORF & REEVES 1939, 248 seqq.

<sup>2</sup> HUMLUM 1942, 37.

being the only place where pod corn occurs. It is true that so far it has not been found growing within the Andean area, but it certainly must have been there at an early period, since a beautiful, pre-Columbian representation of an ear has been found in the Peruvian highlands<sup>1</sup>. Though rarely, pod corn may be met with in México<sup>2</sup>. It was also cultivated by the Iroquois, who have a special name for it, *oná'owē*, said to mean "original maize"<sup>3</sup>. This name, as well as the extremely wide distribution of pod corn, fully confirms the view of botanists concerning the old-fashioned character of this variety, but no reason is left for the supposition that it came from Paraguay. Geographical conditions, corresponding to the requirements of wild maize as regards heat, moisture, and fertile soil, are to be found in other parts of America than Paraguay and neighbouring regions.

HUMLUM'S reference to the native names of corn in Perú and El Gran Chaco is in no better case. It is true that HARSHBERGER mentions some words for maize from the Indians east of the Cordilleras, inferring "that the wild tribes living along the Andean system, in the [*sic!*] El Gran Chaco and elsewhere used Peruvian loan words for maize"<sup>4</sup>. Further inquiry into the identity of the Indians in question, however, reveals the somewhat astonishing fact that the only tribes mentioned are a few Panoan tribes at the southwestern tributaries of the River Amazons between the Ucayali and Rio Madeira (Setebo, Culino, Mayoruna, Caripuná, and Canauari), a single Arawakan tribe within the same area (Araicú), and another Arawakan tribe (Baré) as far north as the region between Rio Negro and Orinoco<sup>5</sup>. Some

<sup>1</sup> MANGELSDORF & REEVES 1939, 245, 247. Cf. CONSTANTIN & BOIS 1910, 253 seqq. In this context some remarks of UHLE (1930, 36) have a certain interest: "*Al Este del Cuzco se cultiva aún, en ciertas haciendas, una clase de maíz de tipo intermedio entre la planta silvestre y su última forma. Muestras de esa planta se han presentado en varias ocasiones aún en Lima. Representa el tipo una forma de maíz todavía a medio desarrollo por el cultivo, introducido, por eso, de México, cuando aun allá no había alcanzado todavía una mejor forma*". Unfortunately UHLE does not give any further information of this primitive type.

<sup>2</sup> MANGELSDORF & REEVES 1939, 245.

<sup>3</sup> PARKER 1910, 43.

<sup>4</sup> HARSHBERGER 1893, 128.

<sup>5</sup> *Ibid.* 127. All the words cited by HARSHBERGER are taken from VON MARTIUS 1867, 427 seq. "Carysuna" mentioned by HARSHBERGER is of course a misprint for Caripuna. It should be added that it seems very doubtful whether the Baré word has anything to do with the Peruvian name at all. HARSHBER-



other names from tribes of Arawakan, Cariban and Tupian stock are of quite different roots and do not concern us here. The main thing is that among the examples mentioned by HARSHBERGER there is not a single one from any tribe in El Gran Chaco.

As a counter-test it is, of course, of considerable interest to investigate what words are actually used by the Indians there. In the first place, however, the Peruvian names should be mentioned. According to MIDDENDORF the Quechua word for maize is *sara*, for roasted maize *chejchi*, and it is the latter — in the form of *cherchi* — which HARSHBERGER believes he has found among the tribes cited above. Among the Aymará (Colla) the corresponding words are *tonco* and *chojillo* or, in the version of DE CRÉQUI-MONTFORT and RIVET, *thulu*, whereas the Chimú of the coast call maize *mang* or *eió*<sup>1</sup>. The Uro, the primitive fisher tribe at Lake Titicaca, supposed to represent a very old and formerly wide-spread stratum of the population of the Andes, use the words *tara*, *tura*, or *туру*<sup>2</sup>. MÉTRAUX calls *tara* a Quechua loan word, and there can hardly be any doubt as to the connection between *sara*, *tara*, *tura*, *thulu*. Whether the original word came from the Quechua may, perhaps, be another question, for it is well known that this nation did not obtain a dominating position in the highlands till very late.

For comparison some words for maize from various tribes in El Gran Chaco are cited below:

Guaycuruan Stock.

Mbayá (Guaycurú, Cadiueo): Payaguá: *n-étz<sub>c</sub>é'c*, *n-eetch<sub>ç</sub>éc*<sup>4</sup>.  
*ittacoli*, *ettáccullî*, *edaqóilige*, Abipón: *n-Emelk*<sup>5</sup>.  
*etacoligî*, *tá<sub>c</sub>ccullî*<sup>3</sup>. Mokoví: *n-asolèh*, *n-asolecà*<sup>6</sup>.

GER'S view can no doubt be traced back to BRINTON (1892, 10), when he writes of the Tacana: "Maize, *shije* or *dije*. — Probably the Pano *schequi*, which in turn is undoubtedly the Kechua *cherchi*, roasted maize".

<sup>1</sup> MIDDENDORF 1890-92, II 347, 759; V 58; VI 61. Cf. DE CRÉQUI-MONTFORT & RIVET 1926, 118.

<sup>2</sup> DE CRÉQUI-MONTFORT & RIVET 1927, 83. MÉTRAUX 1935, 100. Eiusd. 1936, 367.

<sup>3</sup> BOGGIANI 1899, tabella di comparazione. KOCH 1903, 64.—My thanks are due to my friend, Dr. STIG RYDÉN, Göteborg, for this and other references to BOGGIANI'S work as well as those of LAFONE QUEVEDO and HUNT 1915.

<sup>4</sup> BOGGIANI 1899, tabella di comparazione. KOCH 1903, 64.

<sup>5</sup> LAFONE QUEVEDO s. a., 374.

<sup>6</sup> KOCH 1903, 64.

Tobá-Pilagá: *táwara, tavoga, avurra, aorá, avagá, awōrá*<sup>1</sup>.

Samucan Stock.

Chamacoco: *té'guri, taguri, takurü, té'gürü*<sup>2</sup>.

Enimagan Stock.

Sanapaná: *racsartéc, gaséhé*<sup>3</sup>.  
Angaité: *acsactéc, atsaktek*<sup>4</sup>.

Matacan Stock.

Chorote: *peäta, piata, piate, péata*<sup>5</sup>.

Tapiete (Ashluslay): *latsich, láutsilj, kläsichü*<sup>6</sup>.

Mataco: *ijpat*<sup>7</sup>.

Diaguitan Stock (?).

Lule: *pilyš*<sup>8</sup>.

Arawakan Stock.

Chané (Quiniquinao, Tereno):  
*soporo, soppooró, osopporo*<sup>9</sup>.

Guaná: *aracsartéc*<sup>10</sup>.

Tupian Stock.

Chiriguano: *ahuáti*<sup>11</sup>.

Guatoan Stock.

Guató: *madžero, majei*<sup>12</sup>.

Evidently there are words for maize derived from very different roots in El Gran Chaco. It appears, however, that the Chamacoco, belonging to the Samucan stock, use a word of the same root as the Mbayá and Tobá-Pilagá, who speak Guaycuruan languages. The same root is possibly found among the Chané, who were originally an Arawakan tribe but have now been more or less absorbed both linguistically and culturally by the Tupian Chiriguano. Another Arawakan tribe, the Guaná, have evidently adopted the Enimagan stem.

We cannot ignore a certain resemblance between the Uro word *tara* and some of the Tobá-Pilagá forms, *táwara, tavoga*. Exactly how much this means cannot be decided at present. Much depends upon whether the word is of Uro origin or, as MÉTRAUX believes, borrowed from the Quechua. If this be the

<sup>1</sup> KARSTEN 1932, 218. LOUKOTKA 1929-30, 95. KOCH 1903, 64.

<sup>2</sup> BOGGIANI 1899, tabella di comparazione. LOUKOTKA 1929-30, 572.

<sup>3</sup> BOGGIANI 1899, tabella di comparazione. LOUKOTKA 1929-30, 588.

<sup>4</sup> BOGGIANI 1899, tabella di comparazione. LOUKOTKA 1929-30, 588.

<sup>5</sup> KARSTEN 1932, 226. HUNT 1915, 151. NORDENSKIÖLD 1910, 26.

<sup>6</sup> HUNT 1915, 287. Letter from Dr. STIG RYDÉN.

<sup>7</sup> HUNT 1937, 79.

<sup>8</sup> LAFONE QUEVEDO 1894, 335.

<sup>9</sup> NORDENSKIÖLD 1910, 145. BOGGIANI 1899, tabella di comparazione.

<sup>10</sup> BOGGIANI 1899, tabella di comparazione.

<sup>11</sup> NORDENSKIÖLD 1910, 145.

<sup>12</sup> MAX SCHMIDT 1905, 275.

case, a close relation to the Tobá word is practically excluded, for the expansion of the Quechua is so late that the Uro at that time must have lost all contact with either the Tobá or any other Chaco tribe. The probability of a direct connection between the Quechua and the Tobá words is not very great, since they differ more from one another than do the Uro and Tobá names. If nevertheless it can be substantiated, at any rate the reason cannot be that the Quechua have obtained maize from El Gran Chaco, for agriculture was known both in the highlands and on the Pacific coast probably a thousand years before the expansion of the Quechua was sufficiently great to allow any direct contact with the Chaco tribes<sup>1</sup>. The possibility remains that the connection was established via the Aymará. These Indians are supposed to have been the ruling people in the highlands during the Tiahuanaco period before the foundation of the Inca Empire by the Quechua. Under these circumstances they may have come into contact with the tribes on the eastern plains, but this too does not help much. For one thing the Aymará word undoubtedly differs most of all highland forms from the Tobá name, a fact that does not favour the hypothesis of a direct connection, and besides the expansion of the Aymará, like that of the Quechua, presupposes a highly developed agriculture. So far there is no linguistic evidence for assigning to Paraguay the honour of being the home of maize.

The ethnology of El Gran Chaco in general also speaks against this supposition. Originally all tribes within this area lived mainly as fishermen and collectors of wild plants (*Prosopis alba*, *Gourliea decortitans*, *Acacia aroma*, *Zizyphus mistol* and others). Only tribes like the Chiriguano, who did not immigrate to the Chaco till the 16th century, and the Chané, who adopted the mode of life of the Chiriguano, practise agriculture to an extent worth mentioning<sup>2</sup>, whereas it plays only a minimal part among all other tribes. This appears clearly from the words of DE SAINT-HILAIRE cited above, when he denies the possibility of pod corn being grown by the Guaycurú, i. e. the tribe also known as Mbayá. No doubt they may have paid more attention to agri-

<sup>1</sup> RIVET 1924, 10 footnote. TELLO 1928, 690. Eiusd. 1929, 164. UHLE 1930, 35 seq. MEANS 1931, 47.

<sup>2</sup> NORDENSKIÖLD 1917 a. Eiusd. 1910, 168. VON ROSEN 1921, 43.



culture in earlier days. ULRICH SCHMIDEL, who accompanied PEDRO DE MENDOZA, the founder of the first town of Buenos Aires, to La Plata in 1534, says that in his time they cultivated some maize and manioc: "*Diese nationn hatt grosse profanant vom türckischenn khorenn mandeochade, mandepore, mandeos propy, padades, mannduiss, bachakhue unnd ander wurtzl mehr, so zur essentenn speis diennstlich*"<sup>1</sup>. It cannot have been very much, however, since they gave it up so willingly, and NÚÑEZ CABEZA DE VACA, a contemporary of SCHMIDEL, says of the Guaycurú farther north that "they go daily to the chase for it is their only occupation"<sup>2</sup>. FELIX DE AZARA and SÁNCHEZ LABRADOR, both of whom visited Paraguay in the latter half of the 18th century, describe the Guaycuruan and Enimagan tribes (Mbayá, Payaguá, Lengua etc.) as hunters, fishermen and food gatherers<sup>3</sup>. This agrees entirely with the picture given of these Indians in modern times. KOCH-GRÜNBERG calls agriculture among the Tobá-Pilagá "*verschwindend gering*" and is of opinion that the Cadiueo have learned agriculture from the Jesuit Fathers<sup>4</sup>. Agriculture among the Lengua is at the same low level<sup>5</sup>, nor is it of more importance among the Tapiete (Ashluslay), Chorote and Mataco<sup>6</sup>. The Abipón, who lived somewhat farther south and approached the Indians of the Pampas in culture, apparently did not till the soil at all<sup>7</sup>.

Generally speaking, culture is at a low stage among the Chaco tribes not only compared with that of Perú and Colombia, but also with that of the Amazon area. As far as our knowledge goes, it has always played a passive part in the history of South America. The detailed analysis of two such typical tribes as the Chorote and Ashluslay carried out by ERLAND

<sup>1</sup> SCHMIDEL 1889, 85. In the Latin version the text is as follows: "*Abundat autem hæc natio comæatu, farre scilicet Turcico, Mandeoch, Ade [sic!], Mandepore, Mandeoch porpye, padades, Mandues, Pachkeku, atque aliis radicibus, & rebus esculentis*". (SCHMIDEL 1599, 71).

<sup>2</sup> CABEZA DE VACA 1891, 135. There is always the possibility that SCHMIDEL and CABEZA DE VACA are speaking of quite different tribes. Confusion of this kind is often met with in early literature.

<sup>3</sup> AZARA 1904, 365, 389 seq. SÁNCHEZ LABRADOR 1910, 244.

<sup>4</sup> KOCH 1902, 5, 72. Cf. FRIČ 1906, 232.

<sup>5</sup> GRUBB 1911, 77.

<sup>6</sup> HERMANN 1908, 134. NORDENSKIÖLD 1910, 46 seq. VON ROSEN 1921, 196. KARSTEN 1932, 37 seq. RYDÉN 1936, 107 seqq.

<sup>7</sup> DOBRIZHOFFER 1783, 138.

NORDENSKIÖLD<sup>1</sup> plainly shows that the cultural foundation is formed by an exceedingly ancient stratum common to the Chaco tribes, the Pampas Indians, and the Patagonians. In addition there are later influences from the tropical forest region in the North and the Andean area in the West. In both cases the Chané, in the latter also the Chiriguano, have been the principal agents. The Peruvian influence is probably rather late, i. e. later than the rise of the Incan Empire. NORDENSKIÖLD places maize growing in El Gran Chaco among the cultural achievements of which the origin is unknown, but he takes it for granted that it was introduced from without<sup>2</sup>. It is quite certain that the wooden spade employed by some Chaco tribes in their agricultural work came from the Cordilleras<sup>3</sup>. On the other hand, only extremely few and insignificant elements seem to have originated in El Gran Chaco itself, and among them there is hardly a single one that has spread beyond the boundaries of this area. Would it not be somewhat astonishing if the greatest and most revolutionary advance in American culture had been made in this out-of-the-way corner of the continent?

There remains, of course, the possibility that maize came from the Indians of the neighbouring regions, i. e. from Eastern Paraguay, or the tropical savannas of Southwestern Brazil and Northeastern Bolivia. Apart from the Guayaquí, Bororó and other roving tribes at a stage similar to that of the Chaco Indians, we here meet with nations like the Guaraní, Mojo, Baure, and Cavina. The Guaraní belong to the Tupian stock, while the Mojo, Baure and Cavina are Arawakans or, as far as the latter are concerned, rather Arawakized. There are also some linguistically isolated tribes such as the Chimane and Mosekene. All of them are agriculturists<sup>4</sup>, and the Guaraní are of special interest, because they knew and probably cultivated pod corn, as is evident from the observations of DE SAINT-HILAIRE. There can be no doubt that the most advanced culture in this region belongs to the Tupian and Arawakan tribes, all of whom are immigrants. Apparently the Tupian stock as a whole spread

<sup>1</sup> NORDENSKIÖLD 1919, 235 seqq.

<sup>2</sup> Ibid. 28, 263.

<sup>3</sup> Ibid. 29 seq.

<sup>4</sup> D'ORBIGNY 1839, 211, 306, 310. NORDENSKIÖLD 1911, 113, 145, 200. Eiusd. 1915, 222. Eiusd. 1924, 34 seq.

from the country around the Upper Tapajoz and Xingú, and the Guaraní are supposed to represent one of the latest waves from there<sup>1</sup>. The centre of distribution of the Arawakan tribes is situated in Guiana, the Orinoco drainage area, and the regions around the western tributaries of the Amazons. Both stocks were agriculturists before the exodus. It has even been pointed out that the spread of the Arawakans to a great extent took place as a "peaceful penetration" and that the lack of arable lands was an essential factor in their migrations<sup>2</sup>. We are not aware whether for instance the Chimane and Mosekene knew maize growing before the Arawakans entered the country, but at any rate their culture has a purely northern character. The position of maize cultivation within the Amazonian culture will be discussed in the next chapter. Here it will suffice to say that *a priori* it is not very probable that it should have arisen among some insignificant tribes on the outskirts of the area.

<sup>1</sup> MÉTRAUX 1928, 310 seq.

<sup>2</sup> MAX SCHMIDT 1917, 34 seq.



## NEW CONTRIBUTIONS TO THE SOLUTION OF THE PROBLEM

So far the results of our discussion have been essentially negative. We have seen that maize cannot originate from North America. The first traces of maize in these parts occur in the Southwest in the period known as Basket Maker II. It is a small-grained flint corn typical of Central America. In the Pueblo I period Mexican dent appears, and in Pueblo II we meet with the same varieties as those cultivated by the Pueblo Indians of to-day<sup>1</sup>. Dent corn was also grown by the Ozark Bluff Dwellers<sup>2</sup>. All these varieties — including the oldest, if I understand MANGELSDORF and REEVES right — show *Tripsacum* contamination and must accordingly have been introduced from México. Moreover, the technique of maize cultivation in the Southwest points in the same direction, whereas certain features in the southeastern area (the use of hoes, wooden mortars, etc.) are due to a local development or taken over from an earlier food-gathering stage<sup>3</sup>. It is evident from the work of MANGELSDORF and REEVES, however, that México and Central America are also out of the question as primeval maize centres. In fact, only South America is left. In El Gran Chaco and adjacent regions the environment is surely favourable, but it has just been shown that the cultural conditions most decidedly contradict any thought of maize belonging to that part of the continent. As a consequence we are confronted with the alternative of choosing between the Andean regions and the Amazon area.

<sup>1</sup> MANGELSDORF & REEVES 1939, 44, 256.

<sup>2</sup> *Ibid.* 44, 254.

<sup>3</sup> LINTON 1924, 345 seqq. On the other hand it is doubtful whether there has been a spread of maize to North America via the West Indies and Florida, cf. MANGELSDORF & REEVES 1939, 299 seq.

Native culture in the Amazon country is at a considerably higher level than in the Chaco. With a very few exceptions all the Indians are agriculturists. Maize is grown more or less everywhere, but the most important food plant is beyond comparison manioc, of which two species are known, the sweet (*Manihot aipi*), which mainly belongs to the western parts, and the bitter or poisonous sort (*M. utilissima*), which mostly occurs in the east and north. Sweet potatoes, peanuts and several kinds of fruit trees are also of considerable importance, and in post-Columbian times bananas and sugar cane have been added. Unfortunately there is only very little detailed information regarding the types of corn cultivated by the Indians in this area. Most botanists agree, however, that as a whole the character of maize does not accord very well with life in the tropical rain forest. This view is confirmed not only by the secondary place it takes compared with manioc, but also by the fact that the prevailing varieties are not pure types, but the better fitted tropical flint and pop corns with indisputable *Tripsacum* contamination<sup>1</sup>. In other words, maize has not been able to attain even the comparatively modest place which it occupies nowadays within the agriculture of the Amazon area till types better adapted to conditions in the rain forest were developed in México. This certainly does not suggest that the home of maize should be looked for here.

It is much more probable that maize is not the earliest cultivated plant in the Amazon area. ERLAND NORDENSKIÖLD has expressed the same idea, although on the assumption that maize originally belonged to México. At the same time he emphasizes that the cultivation of tuberous plants is more simple than corn growing<sup>2</sup>. Most likely he is thinking particularly of manioc, for linguistic evidence — as he has proved himself on another occasion — goes to show that sweet potatoes appeared later than maize<sup>3</sup>.

As our knowledge of corn types among the Indians of the Amazon region fails us, while the methods of cultivation scarcely differ sufficiently to allow of an ethnological investigation, it will be reasonable to try whether a linguistic treatment of the

<sup>1</sup> MANGELSDORF & REEVES 1939, 299.

<sup>2</sup> NORDENSKIÖLD 1931, 51 seq.

<sup>3</sup> NORDENSKIÖLD 1930, 170 seq.

question opens a practicable road. Below we give a number of words for maize from different tribes within the area, arranged according to stocks<sup>1</sup>.

Arawakan Stock.	Katapolítani: <i>gama</i> <sup>14</sup> .
Arawak: <i>maritchi</i> , <i>marisi</i> , <i>marišt</i> <sup>2</sup> .	Kustenaú: <i>maikí</i> , <i>maíki</i> <sup>15</sup> .
Mapidian: <i>mariki</i> <sup>3</sup> .	Maipure: <i>jomuchi</i> <sup>16</sup> .
Taino: <i>mahiz</i> , <i>mayz</i> , <i>maysi</i> <sup>4</sup> .	Manao: <i>auâty</i> <sup>17</sup> .
Wapisiana: <i>marik</i> , <i>marique</i> <sup>5</sup> .	Mandauaca: <i>makanaži</i> <sup>18</sup> .
Achagua: <i>cana</i> , <i>kana</i> <sup>6</sup> .	Mariaté: <i>pékye</i> <sup>19</sup> .
Adzáneni: <i>kana</i> <sup>7</sup> .	Mehinakú: <i>maíki</i> <sup>20</sup> .
Baniva: <i>makánatsi</i> <sup>8</sup> .	Parauhano: <i>mai</i> , <i>hikíge-mái</i> <sup>21</sup> .
Baré: <i>macanaschy</i> , <i>makánasi</i> ,	Parecí: <i>kôzôtô</i> , <i>kozoto</i> <sup>22</sup> .
<i>maí</i> <sup>9</sup> .	Parecí-Kabishi: <i>kôzírtutse</i> <sup>23</sup> .
Cauixana: <i>mazy</i> <sup>10</sup> .	Passé: <i>niary</i> <sup>24</sup> .
Goajiro: <i>mariki</i> , <i>maík</i> <sup>11</sup> .	Piapoco: <i>kánai</i> , <i>caná</i> <sup>25</sup> .
Guinaú: <i>yú:nu</i> , <i>iyú:nu</i> <sup>12</sup> .	Saraveca: <i>kozeheo</i> <sup>26</sup> .
Karútana: <i>makanaži</i> <sup>13</sup> .	Siusí: <i>káma</i> <sup>27</sup> .
	Tariana: <i>kana</i> <sup>28</sup> .

<sup>1</sup> In the arrangement I have mainly followed RIVET in MEILLET & COHEN 1924.

<sup>2</sup> VON MARTIUS 1867, 311. CREVAUX, SAGOT & ADAM 1882, 66. DE GOEJE 1928, 230, 265.

<sup>3</sup> FARABEE 1918, 284. DE GOEJE 1928, 230.

<sup>4</sup> VON MARTIUS 1867, 318 seq., 428.

<sup>5</sup> FARABEE 1918, 202. DE GOEJE 1928, 230.

<sup>6</sup> ERNST 1891, 3. DE GOEJE 1928, 230.

<sup>7</sup> DE GOEJE 1928, 230.

<sup>8</sup> KOCH-GRÜNBERG 1910, table.

<sup>9</sup> VON MARTIUS 1867, 428. KOCH-GRÜNBERG 1910, table. DE GOEJE 1928, 230.

<sup>10</sup> DE GOEJE 1928, 230.

<sup>11</sup> JAHN 1914, 278. DE GOEJE 1928, 230.

<sup>12</sup> KOCH-GRÜNBERG 1928, 285.

<sup>13</sup> DE GOEJE 1928, 230.

<sup>14</sup> DE GOEJE 1928, 230.

<sup>15</sup> VON DEN STEINEN 1886, 355. Eiusd. 1894, 530. DE GOEJE 1928, 230.

<sup>16</sup> DE GOEJE 1928, 230.

<sup>17</sup> VON MARTIUS 1867, 428.

<sup>18</sup> DE GOEJE 1928, 230.

<sup>19</sup> VON MARTIUS 1867, 268.

<sup>20</sup> VON DEN STEINEN 1894, 528. DE GOEJE 1928, 230.

<sup>21</sup> JAHN 1914, 278. DE GOEJE 1928, 230.

<sup>22</sup> VON DEN STEINEN 1894, 544. ROQUETTE-PINTO 1917, 215.

<sup>23</sup> MAX SCHMIDT 1914, 248.

<sup>24</sup> VON MARTIUS 1867, 256, 428.

<sup>25</sup> KOCH-GRÜNBERG 1928, 297. CREVAUX, SAGOT & ADAM 1882, 246. DE GOEJE 1928, 230.

<sup>26</sup> DE CRÉQUI-MONTFORT & RIVET 1913 b, 534.

<sup>27</sup> FARABEE 1918, 284. DE GOEJE 1928, 230.

<sup>28</sup> DE GOEJE 1928, 230.



Uainumá: *pechkjja*<sup>1</sup>.

Uareca: *makanasi*<sup>2</sup>.

Uiriná: *auati*<sup>3</sup>.

Waurá: *máiki*<sup>4</sup>.

Yaulapití: *máiki*<sup>5</sup>.

Yavitero: *kana*<sup>6</sup>.

Yucuna: *kānē*<sup>7</sup>.

Yumana: *grary*<sup>8</sup>.

Campa (Anti): *sínki, teinkí*<sup>9</sup>.

Canamary: *schischy, ššy*<sup>10</sup>.

Inapari: *iš*<sup>11</sup>.

Ipuriná: *kēmí', kiéma, kímý*<sup>12</sup>.

Kuniba: *šší, čhi*<sup>13</sup>.

Kushití: *šihí*<sup>14</sup>.

Machiyenga: *sínki*<sup>15</sup>.

Palikur: *mahiki*<sup>16</sup>.

Piro: *teiqi, sixi, šixi*<sup>17</sup>.

Sirineiri (Mashco): *hiuje*<sup>18</sup>.

Chané: see p. 13.

Colina: *tapa*<sup>19</sup>.

Guaná (Tereno): see p. 13.

Paumarí: *yoru-ā, joruā, jār wā', džār wā'*<sup>20</sup>.

Yamamadí: *kīmí', tapa, kemí*<sup>21</sup>.

Apolista: *tá, táí, tǎy*<sup>22</sup>.

Baure: *čolo, tyoro*<sup>23</sup>.

Mojo: *suru-ki* (roasted maize)<sup>24</sup>.

Paiconeca: *tiolo*<sup>25</sup>.

Araona: *zia*<sup>26</sup>.

Arasa: *šše*<sup>27</sup>.

Cavina: *exike, ixike, ixiki*<sup>28</sup>.

Chama: *šše*<sup>29</sup>.

<sup>1</sup> VON MARTIUS 1867, 249.

<sup>2</sup> DE GOEJE 1928, 230.

<sup>3</sup> VON MARTIUS 1867, 229.

<sup>4</sup> VON DEN STEINEN 1894, 532. DE GOEJE 1928, 230.

<sup>5</sup> VON DEN STEINEN 1894, 534. DE GOEJE 1928, 230.

<sup>6</sup> DE GOEJE 1928, 230.

<sup>7</sup> FARABEE 1918, 284. DE GOEJE 1928, 230.

<sup>8</sup> VON MARTIUS 1867, 252.

<sup>9</sup> FARABEE 1922, 51. TESSMANN 1930, 103.

<sup>10</sup> DE GOEJE 1928, 230. RIVET & TASTEVIN 1921—22, 313.

<sup>11</sup> RIVET & TASTEVIN 1921—22, 313.

<sup>12</sup> STEERE 1903, 379. KOCH-GRÜNBERG 1919, 82. DE GOEJE 1928, 230.

<sup>13</sup> NIMUENDAJÚ & DO VALLE BENTES 1923, 216. RIVET & TASTEVIN 1921—22, 313.

<sup>14</sup> RIVET & TASTEVIN 1921—22, 109.

<sup>15</sup> FARABEE 1922, 39.

<sup>16</sup> NIMUENDAJÚ 1926, 136. DE GOEJE 1928, 230.

<sup>17</sup> FARABEE 1922, 67. RIVET & TASTEVIN 1921—22, 313.

<sup>18</sup> FARABEE 1922, 78.

<sup>19</sup> RIVET & TASTEVIN 1938, 275.

<sup>20</sup> EHRENREICH 1897, 65. STEERE 1903, 391. DE CRÉQUI-MONTFORT & RIVET 1926, 137. RIVET & TASTEVIN 1938, 275.

<sup>21</sup> EHRENREICH 1897, 69. STEERE 1903, 386. RIVET & TASTEVIN 1938, 275. DE GOEJE 1928, 230.

<sup>22</sup> DE CRÉQUI-MONTFORT & RIVET 1913 c, 530.

<sup>23</sup> DE CRÉQUI-MONTFORT & RIVET 1926, 137.

<sup>24</sup> *Ibid.* 137.

<sup>25</sup> *Ibid.* 137.

<sup>26</sup> BRINTON 1892, 17. DE CRÉQUI-MONTFORT & RIVET 1923, 140.

<sup>27</sup> NORDENSKIÖLD 1905, 12.

<sup>28</sup> DE CRÉQUI-MONTFORT & RIVET 1923, 140.

<sup>29</sup> *Ibid.* 140.

Maropa: *čixe, šixe, shije, tsyihe*<sup>1</sup>.  
 Tacana: *dixe, dije, rixe, äriš<sub>e</sub><sup>ä</sup>,  
 ötiša*<sup>2</sup>.  
 Tamopata: *šiši*<sup>3</sup>.  
 Ticuna: *schiauü, tšávuē*<sup>4</sup>.

Cahuapanan (Maynan)  
 Stock.

Chayahuita: *šiši*<sup>5</sup>.  
 Mayna: *iwuáto*<sup>6</sup>.  
 Xébero: *tšíteř, titör, tötř<sup>n</sup>,  
 tötřlla*<sup>7</sup>.

Cariban Stock.

Apalai: *ouachi, achinase, ochi-  
 nace*<sup>8</sup>.  
 Apiacá (of Pará): *anat, ānat*<sup>9</sup>.  
 Arara: *conat*<sup>10</sup>.  
 Arecuna: *anazi, anáha, a'naí(g)*<sup>11</sup>.

Bakairi: *anáži, anáhi, aráhi*<sup>12</sup>.  
 Caliña: *awasi, aoachy, aunei*<sup>13</sup>.  
 Carib (West Indies): *aoachi*<sup>14</sup>.  
 » (Honduras): *aoachy,  
 avachit*<sup>15</sup>.  
 Cariniaco: *ouachi*<sup>16</sup>.  
 Chakes: *me*<sup>17</sup>.  
 Cumanagoto: *añaze, ayaze,  
 erepa*<sup>18</sup>.  
 Galibí: *awaši, ouachi*<sup>19</sup>.  
 Ipurucoto: *anain*<sup>20</sup>.  
 Macusi and Taulipang: *aunei,  
 anāe, anai(n), a'naí(g)*<sup>21</sup>.  
 Motilón: *mayísa, mayísha, ka-  
 riaco*<sup>22</sup>.  
 Nahuquá: *aná*<sup>23</sup>.  
 Oyana (Roucouyenne): *enai,  
 enai, ehnaye*<sup>24</sup>.

<sup>1</sup> BRINTON 1892, 17. NORDENSKIÖLD 1911, 237. DE CRÉQUI-MONTFORT & RIVET 1923, 140.

<sup>2</sup> BRINTON 1892, 17. DE CRÉQUI-MONTFORT & RIVET 1923, 140.

<sup>3</sup> NORDENSKIÖLD 1905, 12.

<sup>4</sup> VON MARTIUS 1867, 427. TESSMANN 1930, 564.

<sup>5</sup> TESSMANN 1930, 396.

<sup>6</sup> TESSMANN 1930, 294.

<sup>7</sup> BRINTON 1892, 29. BEUCHAT & RIVET 1909, 628. RIVET & TASTEVIN 1930, 257. TESSMANN 1930, 441.

<sup>8</sup> CREVAUX, SAGOT & ADAM 1882, 33. COUDREAU 1892, 68. FARABEE 1924, 234. NORDENSKIÖLD 1930, 170.

<sup>9</sup> EHRENREICH 1895, 174. NORDENSKIÖLD 1930, 170.

<sup>10</sup> NORDENSKIÖLD 1930, 170.

<sup>11</sup> KOCH-GRÜNBERG 1928, 254. NORDENSKIÖLD 1930, 170.

<sup>12</sup> VON DEN STEINEN 1886, 344. Eiusd. 1892, 46. NORDENSKIÖLD 1930, 170.

<sup>13</sup> VON DEN STEINEN 1892, 46. DE GOEJE 1906, 53. Eiusd. 1909, 54. NORDENSKIÖLD 1930, 170.

<sup>14</sup> VON DEN STEINEN 1886, 344. NORDENSKIÖLD 1930, 170.

<sup>15</sup> DE GOEJE 1909, 54.

<sup>16</sup> CREVAUX, SAGOT & ADAM 1882, 270.

<sup>17</sup> TAVERA-ACOSTA 1921, 224. NORDENSKIÖLD 1930, 170.

<sup>18</sup> VON MARTIUS 1867, 428. VON DEN STEINEN 1886, 344. TAVERA-ACOSTA 1922,

74. NORDENSKIÖLD 1930, 170.

<sup>19</sup> CREVAUX, SAGOT & ADAM 1882, 57. NIMUENDAJÚ 1926, 142. NORDENSKIÖLD 1930, 170.

<sup>20</sup> KOCH-GRÜNBERG & HÜBNER 1908, 28. NORDENSKIÖLD 1930, 170.

<sup>21</sup> VON MARTIUS 1867, 227, 428. KOCH-GRÜNBERG & HÜBNER 1908, 28. FARABEE 1924, 123. KOCH-GRÜNBERG 1928, 47. NORDENSKIÖLD 1930, 170.

<sup>22</sup> BOLINDER 1917, 50. NORDENSKIÖLD 1930, 170.

<sup>23</sup> VON DEN STEINEN 1894, 526. NORDENSKIÖLD 1930, 170.

<sup>24</sup> CREVAUX, SAGOT & ADAM 1882, 12. COUDREAU 1892, 32. NORDENSKIÖLD 1930, 170.

Palmella: *éna*<sup>1</sup>.  
 Paravilhana: *aihniain*<sup>2</sup>.  
 Pianacoto: *enaye*<sup>3</sup>.  
 Pimenteira: *thauatõh*<sup>4</sup>.  
 Trio: *ana*<sup>5</sup>.  
 Umáua (Hianacoto): *anaje*,  
*anáji*<sup>6</sup>.  
 Upurui: *enai*<sup>7</sup>.  
 Yauaperý: *déeli*<sup>8</sup>.  
 Peba: *letú*, *vashi*<sup>9</sup>.  
 Yameo: *rolú*<sup>10</sup>.  
 Yagua: *letú*, *hüäsi-wüi*<sup>11</sup>.

## Chapacuran Stock.

Chapacura: *kal'ao*, *xadeau*<sup>12</sup>.  
 Itene: *mapa*<sup>13</sup>.  
 Napeca: *kal'ao*<sup>14</sup>.

Torá: *malpák*<sup>15</sup>.  
 Quitemoca: *kal'ao*<sup>16</sup>.  
 Guahiban Stock.  
 Churrye: *jesá*<sup>17</sup>.  
 Guahibo: *hésoto*, *hetsa*<sup>18</sup>.  
 Pamigua: *jucjá*<sup>19</sup>.

## Panoan Stock.

Amahuaca: *huki*, *toki*<sup>20</sup>.  
 Atsahuaca: *hóqui*, *hóki*, *sitce*<sup>21</sup>.  
 Capanahua: *triki*<sup>22</sup>.  
 Caripuná: *schröki*, *sröki*<sup>23</sup>.  
 Cashibo: *toki*<sup>24</sup>.  
 Catuquina: *söke*<sup>25</sup>.  
 Caxinaua: *söki*<sup>26</sup>.  
 Chacobo: *shéqui*, *šeki*, *rsiki*<sup>27</sup>.  
 Chamicuro: *nãtši*<sup>28</sup>.  
 Conibo: *sërke*, *seki*, *reki*<sup>29</sup>.

<sup>1</sup> NORDENSKIÖLD 1930, 170.<sup>2</sup> VON MARTIUS 1867, 228. VON DEN STEINEN 1892, 46.<sup>3</sup> NORDENSKIÖLD 1930, 170.<sup>4</sup> VON MARTIUS 1867, 220, 427.<sup>5</sup> DE GOEJE 1906, 53. Eiusd. 1909, 210. NORDENSKIÖLD 1930, 170.<sup>6</sup> KOCH-GRÜNBERG 1910, table. NORDENSKIÖLD 1930, 170.<sup>7</sup> DE GOEJE 1906, 53.<sup>8</sup> KOCH-GRÜNBERG & HÜBNER 1907, 243.<sup>9</sup> RIVET 1930, 486. TESSMANN 1930, 473.<sup>10</sup> TESSMANN 1930, 577.<sup>11</sup> RIVET 1911, 203. TESSMANN 1930, 473.<sup>12</sup> DE CRÉQUI-MONTFORT & RIVET 1913 a, 156.<sup>13</sup> Ibid. 156.<sup>14</sup> Ibid. 156.<sup>15</sup> NIMUENDAJÚ 1925, 153.<sup>16</sup> DE CRÉQUI-MONTFORT & RIVET 1913 a, 156.<sup>17</sup> ERNST 1891, 10.<sup>18</sup> CREVAUX, SAGOT & ADAM 1882, 259.<sup>19</sup> ERNST 1891, 9.<sup>20</sup> FARABEE 1922, 111. TESSMANN 1930, 172.<sup>21</sup> NORDENSKIÖLD 1905, 12. FARABEE 1922, 160. DE CRÉQUI-MONTFORT & RIVET 1913, 62. RIVET & TASTEVIN 1932, 258.<sup>22</sup> TESSMANN 1930, 157.<sup>23</sup> VON MARTIUS 1867, 242. DE CRÉQUI-MONTFORT & RIVET 1913, 62. RIVET & TASTEVIN 1932, 258.<sup>24</sup> TESSMANN 1930, 134.<sup>25</sup> RIVET & TASTEVIN 1932, 258.<sup>26</sup> Ibid. 258.<sup>27</sup> NORDENSKIÖLD 1911, 237. DE CRÉQUI-MONTFORT & RIVET 1913, 62. RIVET & TASTEVIN 1932, 258.<sup>28</sup> TESSMANN 1930, 412.<sup>29</sup> FARABEE 1922, 93. RIVET & TASTEVIN 1932, 258.



Culino: *tschüky*<sup>1</sup>.

Lapanaua: *söki*<sup>2</sup>.

Mayoruna: *nási, schuky*<sup>3</sup>.

Nokamán: *atsa*<sup>4</sup>.

Pacaguara: *šeki, tséki*<sup>5</sup>.

Sensi: *šínki*<sup>6</sup>.

Setebo (Pano): *schequi, sékki, tōki*<sup>7</sup>.

Sipibo: *sepó, séqui, reki*<sup>8</sup>.

Urarina (Simacu): *kaxturi*<sup>9</sup>.

Yamiaca: *húqui, húki, ciki*<sup>10</sup>.

Yaminaua: *siki*<sup>11</sup>.

#### Puinavian Stock.

Macú: *kanási, putyum, heégn, hú*<sup>12</sup>.

Puinave: *cana, cojon, mā:i*<sup>13</sup>.

#### Salivan Stock.

Máku: *lūkū*<sup>14</sup>.

Piaroa: *nāmo, nyāmē*<sup>15</sup>.

Sáliva: *yamo*<sup>16</sup>.

#### Timotean Stock.

Kuika: *čxá*<sup>17</sup>.

Maripú: *čixaxak, čipxak*<sup>18</sup>.

Miguri: *hussá*<sup>19</sup>.

#### Tucanoan Stock.

Auxira: *sukála*<sup>20</sup>.

Coto (Orejones): *béa*<sup>21</sup>.

Desana: *ohólęxka*<sup>22</sup>.

Encabellados: *hueha*<sup>23</sup>.

Kobeua: *uěá*<sup>24</sup>.

Pioje: *huea, wěa, huka*<sup>25</sup>.

Quenquehoyos: *bea, huea*<sup>26</sup>.

Tama: *bea, queda*<sup>27</sup>.

Tucano: *ohóka, o-hoka*<sup>28</sup>.

Tuyuca: *ohóluka*<sup>29</sup>.

<sup>1</sup> VON MARTIUS 1867, 244, 428.

<sup>2</sup> RIVET & TASTEVIN 1932, 258.

<sup>3</sup> VON MARTIUS 1867, 428. TESSMANN 1930, 378. RIVET & TASTEVIN 1932, 258.

<sup>4</sup> TESSMANN 1930, 185.

<sup>5</sup> DE CRÉQUI-MONTFORT & RIVET 1913, 62. RIVET & TASTEVIN 1932, 258.

<sup>6</sup> TESSMANN 1930, 189.

<sup>7</sup> VON MARTIUS 1867, 428. TESSMANN 1930, 120. RIVET & TASTEVIN 1932, 258.

<sup>8</sup> VON DEN STEINEN 1904, 47. RIVET & TASTEVIN 1932, 258.

<sup>9</sup> TESSMANN 1930, 508.

<sup>10</sup> NORDENSKIÖLD 1905, 12. FARABEE 1922, 160. RIVET & TASTEVIN 1932, 258.

<sup>11</sup> RIVET & TASTEVIN 1932, 258.

<sup>12</sup> KOCH-GRÜNBERG 1910, table. RIVET, KOR & TASTEVIN 1925, 166.

<sup>13</sup> ERNST 1895, 397. CREVAUX, SAGOT & ADAM 1882, 256. KOCH-GRÜNBERG 1928, 340.

<sup>14</sup> KOCH-GRÜNBERG 1928, 323.

<sup>15</sup> RIVET 1920, 18. KOCH-GRÜNBERG 1928, 355.

<sup>16</sup> RIVET 1920, 18.

<sup>17</sup> RIVET 1927, 159.

<sup>18</sup> Ibid. 159.

<sup>19</sup> Ibid. 159.

<sup>20</sup> TESSMANN 1930, 486.

<sup>21</sup> Ibid. 203.

<sup>22</sup> KOCH-GRÜNBERG 1910, table.

<sup>23</sup> BEUCHAT & RIVET 1911—12, 136.

<sup>24</sup> KOCH-GRÜNBERG 1910, table.

<sup>25</sup> BRINTON 1892, 66. BEUCHAT & RIVET 1911—12, 136. TESSMANN 1930, 221.

<sup>26</sup> BRINTON 1893, 277.

<sup>27</sup> ERNST 1891, 12. BEUCHAT & RIVET 1911—12, 136.

<sup>28</sup> BRINTON 1892, 66. KOCH-GRÜNBERG 1910, table.

<sup>29</sup> KOCH-GRÜNBERG 1910, table.

Uanána: *yó*<sup>1</sup>.Yahuna: *óaka*<sup>2</sup>.

## Tupian Stock.

Anambé: *awati*<sup>3</sup>.Apiacá (at Tapajoz): *ouassi*<sup>4</sup>.Aré: *awači*<sup>5</sup>.Auetó: *awatši, hauatši*<sup>6</sup>.Caingúa: *awači*<sup>7</sup>.Canoeiros (Avá): *awaši*<sup>8</sup>.Cayabí: *uatši*<sup>9</sup>.

Chiriguano, see p. 13.

Coast Tupí: *auaty, ubatim*<sup>10</sup>.Cocama: *awátí, awaté*<sup>11</sup>.Curuayá: *mára*<sup>12</sup>.Émerillon: *ouassi*<sup>13</sup>.Guajajara: *awači, osi*<sup>14</sup>.Guaraní: *avati, avaty*<sup>15</sup>.Kamayurá: *awatsi, awatsi*<sup>16</sup>.Manajé: *awači*<sup>17</sup>.Manitsauá: *maiŋú*<sup>18</sup>.Mauhé: *auatí, awatí, aouati*<sup>19</sup>.Miranya (Boro): *ihio, ixione, õxëë(dok)*<sup>20</sup>.Mundurucú: *morará*<sup>21</sup>.Ntogapid: *naiá*<sup>22</sup>.Omagua: *ahuali, awati, auaty*<sup>23</sup>.Oyampí: *ouassi*<sup>24</sup>.Parentintin (Kawahib): *awaté*<sup>25</sup>.Pauserna (Guarayú): *ahuati*<sup>26</sup>.Tapirapé: *awači, awači*<sup>27</sup>.Tembé: *awači, awatí, awati*<sup>28</sup>.Turiuara: *awati, awači*<sup>29</sup>.Yuruna: *makatí*<sup>30</sup>.<sup>1</sup> KOCH-GRÜNBERG 1910, table.<sup>2</sup> Ibid., table.<sup>3</sup> EHRENREICH 1897, 165. NORDENSKIÖLD 1930, 168.<sup>4</sup> COUDREAU 1897, 189. NORDENSKIÖLD 1930, 168.<sup>5</sup> LOUKOTKA 1929, 392.<sup>6</sup> VON DEN STEINEN 1894, 536. NORDENSKIÖLD 1930, 168.<sup>7</sup> NORDENSKIÖLD 1930, 168.<sup>8</sup> RIVET 1924 a, 177.<sup>9</sup> MAX SCHMIDT 1929, 95.<sup>10</sup> VON MARTIUS 1867, 427. NORDENSKIÖLD 1930, 169.<sup>11</sup> VON MARTIUS 1867, 300, 427. RIVET 1910, 160. TESSMANN 1930, 82.<sup>12</sup> NIMUENDAJÚ 1930, 332.<sup>13</sup> COUDREAU 1892, 139. NORDENSKIÖLD 1930, 169.<sup>14</sup> EHRENREICH 1895, 165. NORDENSKIÖLD 1930, 169.<sup>15</sup> VON MARTIUS 1867, 383. NORDENSKIÖLD 1930, 169.<sup>16</sup> VON DEN STEINEN 1894, 539. NORDENSKIÖLD 1930, 169.<sup>17</sup> NIMUENDAJÚ 1914, 617. NORDENSKIÖLD 1930, 169.<sup>18</sup> VON DEN STEINEN 1886, 361.<sup>19</sup> COUDREAU 1897, 175. NIMUENDAJÚ 1929, 137. KOCH-GRÜNBERG 1932, 44.<sup>20</sup> KOCH-GRÜNBERG 1910 b, 910. WHIFFEN 1915, 308. TESSMANN 1930, 280.<sup>21</sup> COUDREAU 1897, 199.<sup>22</sup> NIMUENDAJÚ 1925, 172.<sup>23</sup> VON MARTIUS 1867, 17, 427. RIVET 1910, 160. TESSMANN 1930, 66. NORDENSKIÖLD 1930, 169.<sup>24</sup> CREVAUX, SAGOT & ADAM 1882, 43. COUDREAU 1892, 98. NORDENSKIÖLD 1930, 169.<sup>25</sup> NIMUENDAJÚ 1924, 265.<sup>26</sup> NORDENSKIÖLD 1930, 169.<sup>27</sup> KISSENBERTH 1922, 60. NORDENSKIÖLD 1930, 169.<sup>28</sup> NIMUENDAJÚ 1914, 617. NORDENSKIÖLD 1930, 169. HURLEY 1931, 342. RICE 1934, 170.<sup>29</sup> NORDENSKIÖLD 1930, 169. NIMUENDAJÚ 1914, 617.<sup>30</sup> VON DEN STEINEN 1886, 363.

## Uitotan Stock.

Koto: *béa*<sup>1</sup>.Okáina: *kōb'é'to*<sup>2</sup>.Uitoto: *bédyai, bédyado, petcāto, bechado*<sup>3</sup>.

## Zaparan Stock.

Andoa: *đáuku*<sup>4</sup>.Iquito: *šakárok*<sup>5</sup>.Záparo: *sáuk*<sup>6</sup>.

## Isolated Languages.

Arda (Yameo): *rolá*<sup>7</sup>.Arikem (Ahôpovo): *guilho, ñgiyá*<sup>8</sup>.Bororó: *kuyeda*<sup>9</sup>.Canichana: *ni-tuxú*<sup>10</sup>.Carajá: *mái, mǎidũzǒ, dōlimé, ĩzēlǎlǎ*<sup>11</sup>.Catuquina: *naty*<sup>12</sup>.Cayuvava: *híqui, hiki, xiki, ixiki*<sup>13</sup>.Cholona: *cach, kaš*<sup>14</sup>.Cófane: *pàpà, pòpò, pépé, hiha*<sup>15</sup>.Huari: *atití, mupóy*<sup>16</sup>.Itonama: *u-dáme, odame, ulame*<sup>17</sup>.Jívaro: *ša, ca, shaya*<sup>18</sup>.Matanauí: *iwarí*<sup>19</sup>.Mosetene: *tara*<sup>20</sup>.Mura: *tiho-ahai, čihuáha, čix-uahā*<sup>21</sup>.Nhambiguara: *guiatê, kuetê*<sup>22</sup>.Palenque (Pariana): *amapo*<sup>23</sup>.Shiriana (Guaharibo): *ęęęęm-óge*<sup>24</sup>.Trumaí: *hotet*<sup>25</sup>.Umotina: *humataká*<sup>26</sup>.Warrau: *nowcom, naucam, neocamo, maicamo*<sup>27</sup>.<sup>1</sup> TESSMANN 1930, 203.<sup>2</sup> Ibid. 559.<sup>3</sup> Ibid. 328. WHIFFEN 1915, 299. KOCH-GRÜNBERG 1910 a, 67, table. FARABEE 1922, 150.<sup>4</sup> TESSMANN 1930, 534.<sup>5</sup> Ibid. 527.<sup>6</sup> Ibid. 546.<sup>7</sup> Ibid. 577.<sup>8</sup> LOPES 1925, 642. NIMUENDAJÚ 1932, 113.<sup>9</sup> VON DEN STEINEN 1894, 547.<sup>10</sup> DE CRÉQUI-MONTFORT & RIVET 1914, 370.<sup>11</sup> KRAUSE 1911, 428.<sup>12</sup> VON MARTIUS 1867, 42.<sup>13</sup> DE CRÉQUI-MONTFORT & RIVET 1917, 258. NORDENSKIÖLD 1911, 237.<sup>14</sup> BRINTON 1892, 35. TESSMANN 1930, 547.<sup>15</sup> CASTELLVÍ 1938, 230.<sup>16</sup> NORDENSKIÖLD 1915, 372.<sup>17</sup> DE CRÉQUI-MONTFORT & RIVET 1918, 50. RIVET 1921, 190.<sup>18</sup> FARABEE 1922, 127. TESSMANN 1930, 365. KARSTEN 1935, 568. FLORNOY 1938, 335.<sup>19</sup> NIMUENDAJÚ 1925, 170.<sup>20</sup> DE CRÉQUI-MONTFORT & RIVET 1926, 137.<sup>21</sup> NIMUENDAJÚ 1925, 163. Eiusd. 1932, 102. NIMUENDAJÚ & DO VALLE BENTES 1923, 220.<sup>22</sup> ROQUETTE-PINTO 1917, 220.<sup>23</sup> TAVERA-ACOSTA 1922, 82.<sup>24</sup> KOCH-GRÜNBERG 1928, 306.<sup>25</sup> VON DEN STEINEN 1894, 541.<sup>26</sup> MAX SCHMIDT 1929, 114.<sup>27</sup> VON MARTIUS 1867, 428. CREVAUX, SAGOT & ADAM 1882, 265. WILLIAMS 1929, 218.



As will appear from this survey, nearly all Tupian tribes employ words of the same root in slightly different disguises: *auatí, aouassí, awači* etc. A few tribes in the Xingú region use words which are evidently borrowed from the Arawakans (*maiḡú, makati*). Probably maize was known to the Tupians, before they spread over the Amazon area.

The same is true of the Caribans<sup>1</sup>. In most cases the words for maize are of the type *anazi, anáji, anai, ana, anat* etc. The Motilón, who live isolated from the rest of the stock in Northern Colombia as neighbours of Arawakan tribes, have adopted the Arawakan word, *majísha*. Among some Cariban tribes in Guiana, the Island Carib, and the Pimenteira of Piauhý, the word comes very close to the Tupian name (*awaši, aouachi, thauatöh*). As far as the first-mentioned tribes are concerned, this cannot be due to any contact with Tupians in historical times, for the Tupians of Guiana (Émerillon, Oyampí, and a few others) did not immigrate to this region till the 18th century<sup>2</sup>. How, then, is this to be explained? We shall return to the question later. Within the Peban group the same word is found (*vashi, hūási-wüi*).

Within the Arawakan stock we find much more diversity in the maize vocabulary than in the two other groups. I am not prepared to enter into any details and shall confine my remarks to what is of immediate importance for the present investigation. Among the Manao and Uirina we meet the same word as among the Tupian and some Cariban tribes (*auáty, auati*). Otherwise a great number of the words for maize can, more or less distinctly, be divided into four groups:

- I. *marisi, mahikí, mahíz, maikí, etc.*
- II. *kāné, kánai, kēmí', káma, etc.*
- III. *čolo, tyoro, tiolo, yoru-a, džārwá, tapa, etc.*
- IV. *tcinki, sínki, tcigi, šiši, ixiki, dixe, rixe, etc.*

It is not improbable that the two first-mentioned groups should be combined (cf. p. 29). The reasons for this diversity within the vocabulary may be manifold. One reason is, perhaps, that maize cultivation is old among the Arawakans, i. e. older

<sup>1</sup> NORDENSKIÖLD 1930, 170.

<sup>2</sup> MÉTRAUX 1928, 292.

than among both the Tupians and the Caribans. At any rate this would agree with the common supposition that the Arawakans were the principal agents in the spread of maize in the Amazon area. Another explanation is that during their migrations the Arawakans absorbed a number of tribes who already knew corn growing and retained the original words. A comparison with the corresponding words among some of the smaller linguistic stocks plainly shows that this presumption must be taken into account. There can hardly be any doubt as to the relationship of the Arawakan words within group IV and those of the Panoan tribes (*šeki, šerke, šröki, ťöki, hōki*) as well as of the Cayuvava (*hiki, xiki*). Perhaps the same root is also found among the Xébero (*ťitör, töt<sup>n</sup>*). The words of groups III show some resemblance to Peban *rolú, lelú*, and Arda *rolú*.

Among the other words within the smaller stocks we evidently find among the Matanauí one related to that of the Tupians (*iwarí*), whereas the Puinave use an Arawakan word (*mā:i*). As for the rest I shall only emphasize the probability of a connection between the words of the Tucanoans (*ueá, béa*) and the Uitoto (*bédyai*), as well as between those of the Jívaro (*ša, shaya*), Záparo (*sáuk*) and Mosekene (*tara*).

We have thus succeeded in reducing a great number of maize words in the Amazon area to a few basic stems: one Tupian, one Cariban, three or four Arawakan, one Tucanoan, and one which may provisionally be termed Jívaran. Is it possible to simplify the picture still further? There is reason to recall HARSHBERGER and BRINTON's aforementioned hypothesis concerning the occurrence of Peruvian loan words in the Amazon area. There is, in fact, a striking resemblance between Quechuan *sara*, Uro *tara*, and the words cited from the Jívaro, Záparo, and Mosekene; geographically these languages come rather close to one another. There is also a very plain agreement between the Quechua word for a roasted maize cob (*chejchi, cherchi*) and the great group of words common to the Panoan and Arawakan stocks (*šerke, šröki, šínki*, etc.)<sup>1</sup> The assumption of relationship is strengthened by the fact that both the Panoan stock and the

<sup>1</sup> SCHULLER (1919-20, 487) compares the latter with Maya *ixim*. It seems to me that the comparison with Quechua is both phonetically and geographically more probable. It is for the future to decide whether there is any connection between the Maya and Quechua words.

Arawakan tribes in question live in the valleys of the eastern Cordilleras or in the lowlands immediately to the East of the mountains, i. e. sufficiently close to the highland peoples to make an influence feasible. The same is true of the Arawakan words of the type *čolo*, *tyoro* and the Peban-Arda *rolń*, *leń*. In this case, however, the correspondence should be looked for in the Uro or Aymar  languages: *туру*, *thulu*. The Arawakan tribes in question live in the Bolivian lowlands between the Mamor  and Guapor , i. e. in a region where there is archaeological evidence of Tiahuanaco influence<sup>1</sup>. It is more remarkable to find the Aymar  word as far away as the middle course of the Pur s, among the Paumar .

An investigation as to how these loans were established would, indeed, be a tempting problem. It seems evident that they proceeded from the Andean to the Amazonian tribes, and not the other way round. This is proved not only by the cultural superiority of the mountain peoples, but also by the fact that to a very great extent it is the Andean words for roasted maize cobs that are found in the lowlands. In other words, the primitive tribes learned to know corn as an article of food among the highly developed mountain peoples<sup>2</sup>. It is hardly advisable to go any further at present. We shall have to wait till the interrelationship of the Andean words has been cleared up at some future time before attempting further advance<sup>3</sup>.

C. H. DE GOEJE has studied the possibility of old, linguistic relations between the Arawakan, Cariban, and Tupian stocks. One of his results is that there is a connection not only between Cariban *ana*, *anazi* and Tupian *awat *, but also between these words and the Arawakan root in *marisi*, *maiki*, *makanazi*, *k nai* etc.<sup>4</sup> If he is right — and at any rate a certain resemblance between the words cannot be denied — this circumstance opens up

<sup>1</sup> NORDENSKI LD 1917, 17.

<sup>2</sup> BRINTON 1892, 10.

<sup>3</sup> Here the position of the Uro is of the utmost importance. RIVET and DE CR QUI-MONTEFORT (1925, 241) believe that they are able to prove a very old connection between them and the Arawakans. Their culture, however, is absolutely Andean, with no affinities to that of the Amazon area (M TRAUX 1934, 190).

<sup>4</sup> DE GOEJE 1928, 66. According to this author the Arawak prefix *k(a)* means something positive or active, whereas the prefix *m(a)* has the double meaning of something negative and of new, fine etc. (DE GOEJE 1928 a, 59, 98, 116 seq.).



perspectives of the greatest importance to the history of Amazonian culture. The view is widened still further if we also take into consideration the Colombian and Central American maize words. Apart from some smaller groups and linguistically isolated tribes we are here concerned with the great Chibchan stock. The words in question are cited below:

Chibchan Stock.

Boruca: <i>kup</i> <sup>1</sup> .	Guamaca: <i>mon-turru</i> <sup>13</sup> .
Bribri: <i>ik, i-kwo</i> <sup>2</sup> .	Ijca: <i>in, in-churu</i> <sup>14</sup> .
Cayapá: <i>pishu, pišu, pi'-cū</i> <sup>3</sup> .	Kágaba: <i>eibi, eivi</i> <sup>15</sup> .
Colorado: <i>pió, pioχ</i> <sup>4</sup> .	Rama: <i>ái, ai</i> <sup>16</sup> .
Cueva: <i>hobba</i> <sup>5</sup> .	Tunebo: <i>eva, eba, eppa</i> <sup>17</sup> .
Cuna: <i>ova, opa</i> <sup>6</sup> .	Changuina: <i>háu</i> <sup>18</sup> .
Guatuso: <i>ai, ain, áin, ái</i> <sup>7</sup> .	Chimila: <i>eibi, aahkuá</i> <sup>19</sup> .
Talamanca: <i>ep</i> <sup>8</sup> .	Chumulú: <i>hábu</i> <sup>20</sup> .
Térraba: <i>ep, ip</i> <sup>9</sup> .	Gualaca: <i>ábu</i> <sup>21</sup> .
Arhuaco: <i>iém, in, kíuane</i> <sup>10</sup> .	Guaymi-Dorasque: <i>éú, xi, vi, yo</i> <sup>22</sup> .
Atánquez: <i>jem-turu</i> <sup>11</sup> .	Paez: <i>kutš, kukx, kokavi</i> <sup>23</sup> .
Chibcha: <i>aba</i> <sup>12</sup> .	

<sup>1</sup> GABB 1876, 583.

<sup>2</sup> *Ibid.* 583. LEHMANN 1920, 324.

<sup>3</sup> SELER 1902, 31. RIVET & BEUCHAT 1907, 64. LEHMANN 1920, 31. BARETT 1925, 1 96.

<sup>4</sup> SELER 1902, 31. RIVET & BEUCHAT 1907, 49. LEHMANN 1920, 31.

<sup>5</sup> LEHMANN 1920, 117.

<sup>6</sup> *Ibid.* 117, 130. KRIEGER 1926, 44.

<sup>7</sup> LEHMANN 1920, 391, 409.

<sup>8</sup> RESTREPO 1895, 24.

<sup>9</sup> LEHMANN 1920, 117, 254 seq., 263. GABB 1876, 583.

<sup>10</sup> LEHMANN 1920, 64.

<sup>11</sup> *Ibid.* 64. *Turu* means maize cob.

<sup>12</sup> URIGOECHEA 1871, 169. MIDDENDORF 1892, 221. RESTREPO 1895, 24. LEHMANN 1920, 47.

<sup>13</sup> LEHMANN 1920, 64. *Turru* means maize cob.

<sup>14</sup> *Ibid.* 64. BOLINDER 1918, 75. *Churu* means maize cob.

<sup>15</sup> PREUSS 1927, 515.

<sup>16</sup> LEHMANN 1920, 442.

<sup>17</sup> RIVET 1924, 47, 75.

<sup>18</sup> RESTREPO 1895, 25.

<sup>19</sup> LEHMANN 1920, 89.

<sup>20</sup> RESTREPO 1895, 25.

<sup>21</sup> *Ibid.* 25.

<sup>22</sup> LEHMANN 1920, 166 seq.

<sup>23</sup> BEUCHAT & RIVET 1910, 46. PITTIER DE FÁBREGA 1907, 321. The two first-mentioned words are modern Quechua meaning "maize as a provision for travelling" (BEUCHAT & RIVET 1910, 57); *kokavi* goes back to the conquest.

Chorotegan (Chiapanecan)  
Stock.

Chiapanec: *namá*, *name*<sup>1</sup>.

Mangue: *nahma*<sup>2</sup>.

Mazatec: *namé*, *nama*<sup>3</sup>.

Mayan Stock.

Cakchiquel: *ixím*<sup>4</sup>.

Chol: *ixím*<sup>4</sup>.

Chontal: *ixím*<sup>4</sup>.

Huastec: *isís*<sup>4</sup>.

Maya: *ixím*<sup>4</sup>.

Quekchí: *ixím*<sup>4</sup>.

Qu'iché: *ixím*<sup>4</sup>.

Tzotzil: *ixím*<sup>4</sup>.

Sumo-Misquitoan Stock.

Cacaopera: *ā-má*, *āima*<sup>5</sup>.

Misquito: *aya*, *áyā*<sup>6</sup>.

Sumo: *am*, *amá*, *hámac*<sup>7</sup>.

Úlua: *ām*<sup>8</sup>.

Xinca-Zoquean Stock.

Mixe: *moč*<sup>9</sup>.

Tapachultec: *mac*<sup>10</sup>.

Xinca: *áima*, *eima*, *ahua*<sup>11</sup>.

Zoque: *mok*<sup>12</sup>.

Isolated Languages of the  
Cordilleras.

Chimu: *manq*, *ció*<sup>13</sup>.

Chocó: *pe*<sup>14</sup>.

Esmeraldas: *vilva*<sup>15</sup>.

Jicaque: *nop*, *duc*<sup>16</sup>.

Lenca: *ama*, *ímā*<sup>17</sup>.

Paya: *aú*, *aũ*, *auñ*<sup>18</sup>.

It is noteworthy that a word for maize cob, entirely or nearly identical with that of the Aymará and Uro (*thulu*, *turu*), is found as far north as among the Ijca, Guamaca and Atánquez (*churu*, *turru*, *turu*), i. e. in the Sierra Nevada de Santa Marta. The similarity is so great that probably anybody would decline to consider it accidental<sup>19</sup>. For our purpose, however, it is of

<sup>1</sup> BRINTON 1892, app. 17. LEHMANN 1920, 847, 883, 892.

<sup>2</sup> LEHMANN 1920, 847, 853.

<sup>3</sup> *Ibid.* 904. BRINTON 1892, app. 17.

<sup>4</sup> STOLL 1884, 54.

<sup>5</sup> LEHMANN 1920, 621. CONZEMUS 1929, 350.

<sup>6</sup> LEHMANN 1920, 519. CONZEMUS 1929, 350. *Eiusd.* 1932, 63.

<sup>7</sup> LEHMANN 1920, 519, 566, 577. CONZEMUS 1929, 350. *Eiusd.* 1932, 63.

<sup>8</sup> LEHMANN 1920, 519, 566. CONZEMUS 1929, 312, 350.

<sup>9</sup> LEHMANN 1930, 784.

<sup>10</sup> *Ibid.* 784.

<sup>11</sup> *Ibid.* 733, 735, 757.

<sup>12</sup> *Ibid.* 784.

<sup>13</sup> MIDDENDORF 1892, 61.

<sup>14</sup> LEHHANN 1920, 89.

<sup>15</sup> SELER 1902, 56. LEHMANN 1920, 36.

<sup>16</sup> LEHMANN 1920, 659. CONZEMUS 1921—23, 168.

<sup>17</sup> LEHMANN 1929, 669, 678, 717.

<sup>18</sup> *Ibid.* 651. CONZEMUS 1927—28, XX 316. *Eiusd.* 1929, 350.

<sup>19</sup> The Paez employ the Quechua words *tsulpi* and *kapiro* for sweet and flour corn respectively. PITTIER DE FÁBREGA (1907, 321) believes that this is because they were introduced from the South in contradistinction to flint maize.

greater importance to notice the resemblance, pointed out already by UHLE<sup>1</sup>, between Chibchan *aba, eva, ep*, etc. on one side and Tupian *avati* on the other, to which, as stated above, the Cariban and Arawakan words are probably allied. It goes without saying that the Tucanoan words *ueá, béa* and Uitoto *bédyai* also belong to the same category. This further applies to Chimu *eió* and some minor groups in Colombia and Central America such as the Chocó (*pe*), Sumo-Misquito (*áyã, âi-má, ãm*), Xinca (*áima*), Lenca (*ama, ímã*), Paya (*ái, aũ*), Chorotegan (*nama, namé*), and perhaps some others as well.

We see that in this way most South and Central American words for maize fall into two great groups. One of them may be called the "Peruvian", as the basic forms have their centre of gravity within the ancient culture area in the highlands of Perú and Bolivia. From here, however, it enters extensive parts of the lowlands east of the Cordilleras (Jívaro, Záparo, Panoans, Mosetene, and the neighbouring Arawakan tribes). On a former occasion we have mentioned the possibility that Peruvian words may also occur among a few Chaco tribes (Tobá-Pilagá, Chamacoco, Chané), and an isolated outpost is found in Northern Colombia. The other group, which may be designated as the "Colombian", is, however, by far the greater of the two. In the West it extends from Northern Perú (Chimu) to Honduras (Lenca, Paya), Guatemala (Xinca), and Southern México (Chiapanec, Mazatec). In addition it comprises nearly the whole of the Amazon area, i. e. the regions of the Tupian, Cariban, Tucanoan and most of the Arawakan stocks as well as some minor groups, and the tracts around the Paraná and on the Brazilian coast inhabited by Tupian tribes.

These facts seem to me to suggest that maize originally came from the Andean area and thence spread in a northerly direction to Central America and towards the east to the Amazon country. We have seen that formerly some botanists were of the same opinion. The choice now lies between the North and the South, Colombia and Perú. Apart from DE CANDOLLE, probably most authors have preferred Perú<sup>2</sup>, but for several reasons I feel inclined to give preference to Colombia.

<sup>1</sup> UHLE 1890, 468. Cf. HARSHBERGER 1893, 127.

<sup>2</sup> Cf. for instance KEMPTON 1926, 38, eiusd. 1938, 394, and COOK 1925.



If we take it for granted that MANGELSDORF and REEVES are right in their characterization of the requirements of wild maize as regards heat, moisture, and fertile soil outside the tropical rain forest proper, we find next to ideal conditions in Northern Colombia. In the regions of the lower Magdalena they recall, in many respects, El Gran Chaco of which MANGELSDORF and REEVES emphasized the favourable environment. The country is a fertile, in some places swampy, alluvial plain, the southernmost part of which is covered with rain forests, whereas the rest is open savanna with forests lining the rivers<sup>1</sup>. Colombia is so eminently adapted to maize growing that it is easily possible to take two harvests in the year, up to a height of 1000 m., and in some places there would be no difficulty in obtaining three by the aid of irrigation<sup>2</sup>. Next to Argentina and Brazil, Colombia is foremost among the South American republics as regards the annual output of maize<sup>3</sup>. We must not forget that even though the most primitive maize type, pod corn, is so far unknown from Colombia, another, very old-fashioned variety, flour corn, occurs abundantly<sup>4</sup>.

It is open to doubt whether the narrow, forest-clad valleys of the Peruvian Cordilleras offer as favourable conditions for maize as do the savannas of Northern Colombia, and in one respect, at least, they are far behind the latter, viz. as far as the possibilities for the spread of maize cultivation are concerned. The moist, eastern slopes of the Peruvian Cordilleras are covered with dense and next to impenetrable rain forests. Communication between the mountains and the Amazon country has always been on an extremely small scale here. Especially the mountain forests between Cuzco and Santa Cruz de la Sierra have been a very effective barrier to the spread of Peruvian culture elements in the eastern lowlands<sup>5</sup>. This agrees particularly well with the rather limited territory where Peruvian loan words for maize are found. In Colombia things are entirely different. To a great extent the mountains are lower than those of Perú, and the transition from the highlands to the plains is less abrupt. There

<sup>1</sup> REGEL 1899, 82 seq., 104.

<sup>2</sup> EDER 1913, 145.

<sup>3</sup> HUMLUM 1942, 68.

<sup>4</sup> BUKASOV 1930, 33, 472.

<sup>5</sup> NORDENSKIÖLD 1917, 19. Eiusd. 1924, 226.

have never been any essential obstacles to the diffusion of Colombian elements to the neighbouring regions, and Colombian influences can be traced far north into Central America, in the West Indies, and in great parts of the Amazon area. It is quite consistent with the geographical features of the country that Colombian loan words for maize have such a wide distribution.

Thus many circumstances go to show that maize originates from Colombia and more especially, perhaps, from the northern part of the country. On the whole Colombia seems to offer extraordinarily good conditions for the development of the earliest American agriculture. Russian botanists have strongly emphasized the position of Colombia as a primary domestication centre<sup>1</sup>. Arracacha (*Arracacia xanthorrhiza*), a tuberous plant belonging to the tribe of *Umbelliferae*, which played a prominent part among the Chibcha and is still grown to a considerable extent in the lower regions of the mountains, is perhaps older as a cultivated plant than both potato and manioc<sup>2</sup>. Two primitive types of potatoes (*Solanum rybinii* and *S. boyacense*) are still to be found in Colombia<sup>3</sup>. Quinoa (*Chenopodium quinoa*), the cultivation of which has now been abandoned in Colombia, was likewise grown by the Chibcha<sup>4</sup>. Throughout the tropical parts of South and Central America two species of manioc occur, poisonous or bitter manioc (*Manihot utilissima*) and sweet manioc (*M. aipi*). ERLAND NORDENSKIÖLD has studied their distribution in South America<sup>5</sup>. He arrived at the conclusion that both species are cultivated by most tribes of the Amazon area. In a few places, however, only the bitter species occurs: at the upper Xingú, among the Indians of the lower Amazons, among the Mauhé and Mura along the middle course of this river, in the regions of the upper Içá and

<sup>1</sup> BURASOV 1930, 33 seq., 472.

<sup>2</sup> Ibid. 248 seqq., 425.

<sup>3</sup> Ibid. 35, 474.

<sup>4</sup> URICOECHEA 1936, 81.

<sup>5</sup> NORDENSKIÖLD 1923, 34 seqq. To this some additions may be made. RIVET (1905, 194) writes of the Colorados of Ecuador that they grow *Manihot utilissima*, but in the vocabulary (1907, 49) he only mentions *M. aipi*, and this is probably correct. VON HAGEN (1939, 35) does not specify the plant, nor is it done for the Cayapá (BARETT 1925, I 95). BOLINDER writes that bitter manioc is unknown all over the Magdalena region (1924, 220). The Piapoco have names for both species, but evidently the bitter manioc is most important, as this is the only species mentioned by BOLINDER in connection with their agriculture (1936, 78). Among the Chocó bitter manioc is unknown (NORDENSKIÖLD 1928, 133. WASSÉN 1935, 86). The Moré grow the sweet species only (RYDÉN 1942, 104).

Yapurá, among some tribes of Northern Venezuela, and among the Carib and Arawak of the West Indies. In contradistinction to these scattered occurrences there is a wide, western territory in South America where only sweet manioc is grown. It extends from El Gran Chaco and Northeastern Bolivia across the mountains and coasts of Perú, Ecuador, and Colombia to the shores of the Caribbean Sea. From Central America our information about manioc is less complete. JOYCE is uncertain whether it was known at all in Nicaragua and Northeastern Costa Rica in pre-Columbian times<sup>1</sup>. From our own day SAPPER mentions the bitter species only<sup>2</sup>. We know, however, that not only do the Indians cultivate *M. aipi*, but that in several cases it is the only species grown. Thus both the Rama, Mísquito and Sumo have only sweet manioc, whereas the Paya and so-called "Black Caribs" cultivate the bitter species<sup>3</sup>. From the Talamanca there is no specification<sup>4</sup>. Only sweet manioc is mentioned from Coclé<sup>5</sup>. As stated by NORDENSKIÖLD, there is reason to believe that sweet manioc has penetrated into the Amazon area at a rather late period and that the bitter species was the original one there. It does not follow, of course, that bitter manioc is the older on the whole. To be sure NORDENSKIÖLD suggests that it was the poison itself that was desired at first, for instance for fishing purposes. Nevertheless, it seems more likely that the Indians started with the cultivation of the sweet species as a food plant and later on acquired the knowledge necessary for the use of the poisonous plant. If this be so, manioc also must come from western South America; probably, as SAUER believes, from "the dry margins of savanna conditions"<sup>6</sup>, and not improbably from Colombia.

The importance of Colombia as the primary agricultural centre of the New World is further corroborated when we study the methods of tilling which may be supposed to have been employed. Several authors have, certainly not without reason,

<sup>1</sup> JOYCE 1916, 37.

<sup>2</sup> SAPPER 1905, 15.

<sup>3</sup> BOVALLIUS 1887, 304. CONZEMICUS 1927, 291. Eiusd. 1929, 311. Eiusd. 1932, 62.

<sup>4</sup> BOVALLIUS 1885, 211. Manioc is not mentioned from the Bribri at all (SKINNER 1920).

<sup>5</sup> LOTHROP 1937, 16.

<sup>6</sup> SAUER 1936, 292.



laid stress on the difficulties which the steppes and savannas must have presented to primitive agriculture. The loose soil of the forests must have offered much easier conditions, when trees and undergrowth were cleared away. On the other hand, MAX SCHMIDT rightly calls attention to the difficulty of clearing the tropical forest for a primitive population which has nothing but fire and stone axes at its disposal<sup>1</sup>. On the basis of his own observations among the Guató in the source region of the Paraguay he forms an hypothesis regarding the origin of South American agriculture. The transition from hunting life must surely have been gradual. Many tribes both in the Amazon area and El Gran Chaco collect wild fruits and tubers, and many fruit trees occur both as wild and planted, for instance the acurí palm (*Astrocaryum?*), the fruits of which are an important food among the Guató. The palms are cultivated on low mounds, *aterrados*, which have come into existence through the fertile earth gathered by the Indians in the surrounding swamps being gradually accumulated for the purpose. In this manner they derive advantage from the open country and avoid the laborious clearing of the tropical forest. MAX SCHMIDT is of opinion that South American agriculture originated in a similar way, so to speak on the border line of the forest and savanna.

In many places in South America outside the rain forest proper we find Indian villages standing on artificial mounds, and — as ERLAND NORDENSKIÖLD says in regard to the alluvial plains of Northeastern Bolivia — it is not likely that they were erected for habitation alone, but principally for the planting of manioc, sweet potatoes etc.<sup>2</sup> MAX SCHMIDT also mentions similar mounds from the mouth of La Plata and compares them to the well-known structures of Central and North America. They likewise occur in other parts of South America: in the inland delta of the Paraná, in the province of Santiago del Estero in Argentina, on the Marajó Island in the mouth of the Amazons, etc.<sup>3</sup> The Taino on the Greater Antilles cultivated maize, manioc and other plants on artificial mounds or *montones*, which are probably the result of an adaptation of the ancient principle to

<sup>1</sup> MAX SCHMIDT 1922, 117.

<sup>2</sup> NORDENSKIÖLD 1916, 148.

<sup>3</sup> KÜHN 1934, 66. WAGNER 1934, 23 seqq. MORDINI 1934, 62.

the local climate<sup>1</sup>. HATT has studied several of them in Santo Domingo<sup>2</sup>. I am not aware whether similar mounds occur in northern Colombia, though the environment there must have invited the erection of such. These regions, where the Spanish introduced systematic grave looting immediately after the conquest, do not seem to have attracted the attention of modern archaeologists to the same extent as the Colombian highlands. We know, however, that the Quimbaya in the Cauca Valley built their villages on mounds rising above the swampy surroundings<sup>3</sup>. They grew i. a. maize and different kinds of fruit trees<sup>4</sup>. If MAX SCHMIDT is right in his view of the origin of South American agriculture, Colombia will no doubt have been well fitted for the purpose.

<sup>1</sup> LOVÉN 1935, 353 seq.

<sup>2</sup> HATT 1932, 12.

<sup>3</sup> SELER 1915, 64.

<sup>4</sup> RESTREPO TIRADO 1912, 53.

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## COLOMBIA AS A CULTURAL CENTRE. CHRONOLOGY

As the supposed first centre of agriculture on the western hemisphere, Colombia must for a long time have had the benefit of an essential start in development as compared with the rest of the continent. We might expect this circumstance to have left its traces in the cultural history of the surrounding regions. This, in fact, seems to be the case.

It has been known for a long time that several elements are common to Colombia, the Amazon area, and the earliest periods of Perú. RIVET mentions for instance throwing sticks, blow guns, labrets, Pan-pipes, head trophies, and metallurgy of a gold-copper alloy (*guanín, tumbaga*)<sup>1</sup>. All these elements are known to occur in the first agricultural periods on the coast of Perú, i. e. the Early Chimu and Nazca periods, with the exception of *tumbaga*; on the other hand, pure gold was known both in these periods and possibly in the Panzaleo II in Ecuador<sup>2</sup>. "It is also an interesting point," says ERLAND NORDENSKIÖLD, "that the hammock and the wooden seat, two exceedingly important culture elements in the Amazonas, were used in Peru only as insignia of rank, a fact which points to their being relics of an earlier civilization"<sup>3</sup>. Tripod vessels are likewise common to the said areas. They occur in some places in the Amazon region, e. g. in the Santarem culture, in Colombia, Ecuador, and Perú<sup>4</sup>. Both in Ecuador and the Peruvian highlands they extend as far back as the earliest periods, in Ecuador to the Panzaleo I and in Perú to the Callejón de Huaylas pottery, where some are plain imitations of the tubers of the arracacha plant<sup>5</sup>. Negative pottery

<sup>1</sup> RIVET 1925, 2 seqq.

<sup>2</sup> RIVET 1925, 14. KROEBER 1930, 10 seq. JIJÓN Y CAAMAÑO 1930, 196.

<sup>3</sup> NORDENSKIÖLD 1931, 52.

<sup>4</sup> LINNÉ 1929, 111 seqq.

<sup>5</sup> JIJÓN Y CAAMAÑO 1930, fig. 22. TELLO 1929, 90 seq. Eiusd. 1930, 287. The archaeology of the Amazon area is still in its first beginnings, and it is too early to express an opinion as to the age of the finds. MORDINI (1934, 196 seq.)



painting is wide-spread in northwestern South America; it is likewise found in very early times: Panzaleo II in Ecuador and Callejón de Huaylas (Recuay) in Perú<sup>1</sup>. Flat pattern stamps (*pintaderas*), which, judging from their wide distribution, must be very old, should, perhaps, also be mentioned in this context<sup>2</sup>. Special attention should be paid to the primitive stone sculpture that attained such a monumental development at San Agustín in Colombia. There is an unmistakable similarity between the art of this region and the early sculpture from Chavín as well as certain pottery patterns from Early Nazca<sup>3</sup>. The stylistic characters of San Agustín art, for instance the combined representation of a human being and an animal supposed to be the "Second Ego" of the person, are also known from Ecuador, Tiahuanaco and from some figurines from the Rio Trombetas and other places in the Amazon area<sup>4</sup>.

How should this cultural conformity be explained? Where did the elements in question originate? Within the Andean area the main flow seems to have been from the highland to the coast, and from the North to the South. TELLO, probably the

has shown that the grotesque pottery, known for instance from NIMUENDAÚ's excavations at Santarem, was made as late as the 16th century. NORDENSKIÖLD (1930, 28 seqq.) and LINNÉ (1928, 84 seqq.) emphasize the similarity with West Indian and Central American pottery (cf. also MORDINI 1934, 200). A recent analysis gives the remarkable result that it is closely related not only to the ceramics of the Isthmian area, i. e. Panamá and Costa Rica, but also to that of the Mississippi valley, whereas the relations to the West Indies, Venezuela and Colombia are somewhat vaguer (PALMATARY 1939, 122 seq.). It should be borne in mind, however, how insufficiently the latter areas are known. According to MORDINI the painted, anthropomorphic burial urns from Marajó, Rio Arucauá and Cunany belong to a culture older than that of Santarem; in this case the connection with Colombia is beyond doubt (MORDINI 1934, 199 seq. NORDENSKIÖLD 1930, 31).

<sup>1</sup> TELLO 1929, 95. KROEBER 1930, 17. JIJÓN Y CAAMAÑO 1930, 140.

<sup>2</sup> LINNÉ 1929, 40 seqq.

<sup>3</sup> PREUSS 1929, 111 seq. TELLO 1930, 283.

<sup>4</sup> PREUSS 1929, 113. NORDENSKIÖLD 1930, 36, pl. XL—XLI. NORDENSKIÖLD 1931, 63. JIJÓN Y CAAMAÑO 1930, pl. XVI. Certain features also seem to occur on some wooden objects in old, European collections, for instance in the Ethnographical Department of the National Museum, Copenhagen. It is highly regrettable that so little is known of the social organization in South America, since further evidence of cultural connections within the northwestern parts of the continent might be expected to occur there. Though differing in their views of the ultimate origin of dual organization, NIEUWENHUIS and HAECKEL agree in considering Colombia as its principal centre in South America (NIEUWENHUIS 1933, 141 seqq. HAECKEL 1939, 451 seqq.) Matrilineal descent is characteristic of the Chibchans and the Arawakan tribes of Guiana and the West Indies (W. SCHMIDT 1913, 1071 seqq. KIRCHHOFF 1932, 108 seq. OLSON 1933, 371 seq., 382 seqq.).

greatest judge of Peruvian culture, has very strongly emphasized the precedence of the highlands as compared with the coast, in sharp contrast to earlier views; and in the main both A. L. KROEBER and ERLAND NORDENSKIÖLD seem inclined to agree with his opinion<sup>1</sup>. It is of no slight significance in this context that a woollen bag containing quinoa seeds was found in a grave from the primitive fishermen at Arica, for this shows that both llama breeding and agriculture were practised in the mountains at this early period<sup>2</sup>. That the culture flow mainly took a southerly direction can scarcely be doubted, e. g. as far as sculpture is concerned<sup>3</sup>. RIVET believes that the same is true of the elements discussed by him. He refers for instance to the fact that the throwing-stick hooks are always made of stone in Colombia, nearly always so in Ecuador, but very often of copper or bronze in Perú<sup>4</sup>.

Thus the question as to the origin of these elements tapers down to the problem whether they first occur in Colombia or in the Amazon area, which, in this case, means Guiana and the Orinoco regions. RIVET prefers the latter parts. He seems to found his opinion mainly upon the wide distribution of the elements in the Amazon area and upon the unquestionable immigration of Cariban tribes to Colombia. He believes that on that occasion they brought with them the knowledge of *tumbaga*<sup>5</sup>. In reality, none of his arguments is conclusive<sup>6</sup>. On the contrary, it is far more probable that for instance the goldsmith's art, both with and without copper alloys, originated in Colombia, for not only does gold occur in greater quantities there than in Guiana, but the cultural level was higher and the knowledge of metallurgy far more advanced in the Cordilleras. LOVÉN is of the same opinion<sup>7</sup>. Pure gold work is, of course, simpler and more wide-spread than *tumbaga* work; probably it is also more ancient. NORDENSKIÖLD believes that the alloying of gold and

<sup>1</sup> KROEBER 1927, 638 seq. NORDENSKIÖLD 1931, 53.

<sup>2</sup> UHLE 1930, 36 seq.

<sup>3</sup> PREUSS 1929, 116.

<sup>4</sup> RIVET 1925, 3 seq.

<sup>5</sup> RIVET 1923, 193 seq.

<sup>6</sup> KROEBER (1930, 19) is of the same opinion. He also believes that the elements in question spread to the Amazon area from the Cordilleran region, i. e. Perú. Nobody seems to have thought of Colombia.

<sup>7</sup> LOVÉN 1935, 469.

copper was invented in Colombia in imitation of Peruvian bronze<sup>1</sup>. There can be no doubt that the San Agustín style originally belongs to Colombia and from there influenced the art of the Amazon area<sup>2</sup>. Of the other culture elements we know too little at present to decide how they spread in South America. It should be mentioned, however, that LINNÉ considers negative pottery painting at the Amazons as an off-shoot of Colombian technology<sup>3</sup>. It is also worthy of note that if the throwing stick, blow gun and head trophies are connected with the corresponding elements in North America — and at least this is a rather obvious conclusion — it is not very probable that they should have come to Colombia via the Amazon area, whereas a migration in the opposite direction meets no difficulties. In addition NORDENSKIÖLD has proved that as late as the 16th century<sup>4</sup> the distribution of the blow gun was restricted to Colombia and Eastern Perú. IZIKOWITZ mentions the possibility that the Pan-pipe was invented somewhere around the upper Rio Negro; but he is most inclined to leave the question open, i. a. in view of the possibility of a connection with the instruments of the Old World<sup>5</sup>.

The northwestern culture elements in South America discussed here are certainly of very different age and, for the greater part at least, essentially later than maize cultivation. It is by no means my intention to assert that they spread together with agriculture. My sole aim has been to present the evidence which more or less irrefutably proves the importance of Colombia as a cultural centre in South America as far back as the first periods of higher civilization in Ecuador and Perú (Panzaleo, Chavín, Early Chimu, and Early Nazca). It should be particularly emphasized that basic elements such as metallurgy and stone sculpture probably originate in Colombia. By regressive inference this seems to point towards an early cultural superiority which indirectly supports the hypothesis of the origin of agriculture in these regions. To this may be added the aforementioned view that in many places in the Amazon area agriculture was introduced by the Arawakans. It is generally assumed that the home

<sup>1</sup> NORDENSKIÖLD 1931, 106.

<sup>2</sup> PREUSS 1929, 116.

<sup>3</sup> LINNÉ 1925, 136.

<sup>4</sup> NORDENSKIÖLD 1924, 62.

<sup>5</sup> IZIKOWITZ 1935, 403 seq.



of the Arawakan stock should be looked for in northwestern South America, and in a work which has unfortunately been inaccessible to me, URICOECHEA is said to maintain that the Caquetio, an Arawakan tribe, were the forerunners of the Chibcha in the Colombian highlands.

After discussing the cultural position of Colombia in relation to South America it remains to study the connections with the West Indies and Central America. As far as the West Indies are concerned, we can be very brief. It is well known that both the Arawakan and the Cariban population of the islands had come from the north coast of South America, carrying with them the essential elements of their culture. Some of the elements mentioned here never reached the islands, viz. the blow gun, Pan-pipe and stone sculpture in the San Agustín style. The culture waves that in later times influenced Arawakan culture, however, came mostly from Colombia<sup>1</sup>.

Conditions similar to those of the West Indies prevailed in southern Central America. The population of Panamá, Costa Rica, and southern Nicaragua was made up of Chibchan tribes closely related to those of northern South America. Farther north in Nicaragua and Honduras there are tribes belonging to the Sumo-Mísquito group, Paya, and Lenca, which LEHMANN includes among the Chibchans in a wider sense. So far this is an unproven assertion, but at any rate they are culturally related to South America. This also applies to the Chorotegans, who, at the time of the conquest, were restricted to Nicaragua and northern Costa Rica, but probably in former times extended over far wider areas and are supposed to be the bearers of pre-Mayan culture. According to SPINDEN the Mísquito, Paya, and Jicaque immigrated from South America, and LOTHROP believes that all the peoples mentioned, including the Chorotegans, came from this continent<sup>2</sup>.

Under these circumstances it is not surprising to find close cultural affinities between Central and South America. As far North as the highlands of Costa Rica, the culture had a pure South American stamp, and South American influences go still farther<sup>3</sup>.

<sup>1</sup> LOVÉN 1935, 664.

<sup>2</sup> SPINDEN 1925, 543 seq. LOTHROP 1921, 318 seq. Eiusd. 1937, 202.

<sup>3</sup> LOTHROP 1926, 411, 413. WASSÉN 1936, 45.

As indicated above, however, far from all the elements common to northwestern South America and Central America are supposed to originate in Colombia. Some of them, e. g. the throwing stick and the head trophies, probably came from the North<sup>1</sup>. The case of the blow gun is more doubtful. I consider it extremely unlikely that it should have been invented in several places in the western hemisphere, as suggested by LINNÉ<sup>2</sup>. Serious objections may also be raised against the assumption that it was introduced from the Old World<sup>3</sup>, although it is not entirely precluded. So far the question of its origin in America remains open and, as a consequence, also the question of its route of migration. The same applies to the Pan-pipe.

Metals, including gold, were not known to the Maya and Mexicans till rather late. Objects of gold have neither been found from the Maya Early Empire nor from the Teotihuacán culture<sup>4</sup>, and it is not at all unlikely that this late appearance is due to the fact that it came originally from South America. A certain amount of import must have taken place from the South to Yucatán, where *tumbaga* figurines in the Coclé style have been found at Chich'én Itzá<sup>5</sup>. Tripod vessels are much older than metal in México. They occur in the pre-Mayan pottery from Holmul as well as in the Zacatenco culture, at any rate in its later phase<sup>6</sup>. The fact that some of the earliest specimens from South America are imitations of arracacha tubers may, perhaps, be taken as evidence of their South American origin. As to the home of negative pottery-painting opinions differ. LINNÉ recently studied the problem without arriving at a definite answer<sup>7</sup>. LOTHROP, the eminent judge of Central American ceramics, is convinced, however, that it came from South America<sup>8</sup>. As to the primitive stone figures from Nicaragua, so well known from the descriptions of BOVALLIUS, PREUSS has no doubt but that their prototypes should be looked for in the sculpture of San Agustín<sup>9</sup>.

<sup>1</sup> BIRKET-SMITH 1929, 65 seqq., 153 seqq., 249, 321 seq. FRIEDERICI 1906, 77 seqq.

<sup>2</sup> LINNÉ 1934, 192.

<sup>3</sup> NORDENSKIÖLD 1931, 16 seqq.

<sup>4</sup> LINNÉ 1934, 208 seqq.

<sup>5</sup> LOTHROP 1937, 204.

<sup>6</sup> MERWIN & VAILLANT 1932, 93. VAILLANT 1930, 87. Eiusd. 1935, 225.

<sup>7</sup> LINNÉ 1934, 163.

<sup>8</sup> LOTHROP 1926, 409 seq.

<sup>9</sup> BOVALLIUS 1886, passim. PREUSS 1929, 112 seqq. Cf. LOTHROP 1921, 316 seqq.

Thus the question of Colombian influences is often less clear in Central America and México than in South America. On the other hand, both linguistic and cultural evidence give an indisputable answer in several cases. It may even be probable that our view of some problems will change when the hypothesis of the Mexican origin of maize cultivation is abandoned. Putting everything together we are, perhaps, justified in saying that the cultural development in Central America and México rather favours the hypothesis of the fundamental importance of Colombia in the creation of American agriculture.

When agriculture had been introduced into Perú and Bolivia to the south and into Guatemala and México to the north, the cultural growth was hastened in these countries, and gradually the aboriginal centre was overshadowed by them. In many respects they took different roads. Some inventions were made in México while they are missing in Perú, and vice versa<sup>1</sup>. Nevertheless, there must have been a certain connection, principally in early times, but also much later, for even among very late elements, as for instance the bronze technique, there are resemblances which cannot be explained otherwise than by direct communication between México and Perú<sup>2</sup>. This communication must have taken place by sea, for Colombia did not take part in it. Here culture retained a primitive, old-fashioned stamp. By way of a somewhat hazardous comparison we may liken the part played by Colombia in the development of American culture to that of Western Asia in the Old World. From Western Asia came wheat and barley, and here the germs of civilization originated, but in the course of time the focus of development was shifted to Europe in the West and China in the East.

Only very little can at present be said about the time when Colombia occupied a dominant position, and still less of the time when maize cultivation came into existence. The beginnings of an absolute chronology are only found in two places in America, viz. in the southwestern United States thanks to the tree-ring method of A. E. DOUGLASS, and in the Maya area; but

<sup>1</sup> NORDENSKIÖLD 1931, 53 seqq.

<sup>2</sup> ARSANDAUX & RIVET 1921, 275 seq. LOTHROP 1926, 406. KRICKBERG 1928, 379 seqq. KROEBER 1930, 15 seqq.



in any case it scarcely carries us as far back as the beginning of our era. In México, Ecuador, and Perú there are relative chronologies. In southern Central America and Colombia even these are missing, and here we are wholly reduced to uncertain inferences.

Maize was grown in the Southwest by the Basket Makers, and considerable amounts of corn have been found in their graves and storage pits<sup>1</sup>. So far we have no idea of what took place immediately before the Basket Maker period. Between the latter and the extremely primitive and apparently very old hunting cultures, the remains of which have been found in the Guadalupe Mountains, at White River etc., there is a gap which intensive study has been unable to bridge. Upward, the Basket Maker period is succeeded by the Pueblo culture, the oldest phase of which, known as Pueblo I, can be fixed with considerable certainty at 800—900 A. D.<sup>2</sup> It is very difficult to form an opinion of the length of the Basket Maker periods. Originally KIDDER considered them to be of very long duration and put their beginning at about 1500 or 2000 B. C.<sup>3</sup>, but evidently he has changed his opinion considerably. At present he believes that the Basket Maker II period was nothing but a rather short interval between the introduction of agriculture and pottery respectively, pottery being the chief characteristic of Basket Maker III<sup>4</sup>. Even with due regard to this limitation it must be supposed, however, that the beginning of the period falls before the birth of Christ. The so-called Colonial Period of the Hohokam culture in the Lower Gila region roughly corresponds to Basket Maker III<sup>5</sup>.

Remains of a culture which on conclusive points correspond to those of Basket Maker II, have been found in Chihuahua, Durango, and Coahuila in México<sup>6</sup>. A dating of these finds has so far been impossible. We can only arrive at an approximation by comparison with the archaic culture, the earliest period of which, the Zacatenco culture, according to VAILLANT lasted from about

<sup>1</sup> KIDDER 1924, 78. Only Basket Maker II and III are taken into account. So far Basket Maker I is purely hypothetical. Cf. ROBERTS 1935, 9 seqq.

<sup>2</sup> ROBERTS 1935, 25.

<sup>3</sup> KIDDER, 1924, 119.

<sup>4</sup> *Eiusd.* 1936, 147.

<sup>5</sup> GLADWIN 1937, 9 seqq. Cf. also ROBERTS 1935, 19 seq.

<sup>6</sup> KRICKBERG 1939, 166. Cf. SELER 1904, 388 flg. 51. RAMÍREZ 1903, 459 seqq.

250 B. C. till 500 A. D.<sup>1</sup> The Zacatenco culture is, however, very far from being primitive<sup>2</sup>. The most adequate parallel is probably found in Pueblo III, which means that an unknown development covering at least some hundred years must be inserted between the Zacatenco and Basket Maker periods. Most likely we must be prepared to fix the introduction of agriculture into México as far back as the early half of the first millenium B. C.

The oldest, dated Maya monument is the famous Tuxtla statuette, which bears the date 162 A. D. according to the Thompson correlation. At that time the Maya calendar must have been fully developed and had probably been in use for one or two hundred years. It goes without saying, however, that prior to a chronology so intricate as that of the Maya there must have been a long period of settled life and exact, astronomic observations. This carries us as far back as the introduction of agriculture into México. The so-called pre-Mayan culture is still far too little known to add any important contribution to the solution of the problem. Evidently its later phases existed side by side with the early Maya culture, and not till 500 or 700 A. D. was it superseded in the highland of Guatemala<sup>3</sup>.

JIJÓN Y CAAMAÑO summarizes his studies of the cultural development in Ecuador (Chimborazo and Manabí) in the following words: "*A una población primitiva, con cultura semejante a la de los actuales Fueguinos o a la de los pescadores primitivos de Arica, habría sucedido ótra, cuya civilización era irradiación de la arcaica (Proto-panzaleo I, Pre-pto-lima); luego, nuevas olas culturales, conexas con el avance hacia el sur de los Chorotegas, antes del año 100 anterior a Jesucristo, habrían producido una nueva fecundación (Proto-panzaleo II); vinieron después otras mareas, entre ellas la más importante derivada del arte chorotega, ya influido por el de los Mayas del antiguo imperio (100—600 A. D.), que se extendió por una gran región de América o influyó en los estilos de Chavín y Tiahuanaco*".<sup>4</sup> It is of no consequence that the

<sup>1</sup> VAILLANT 1935, 258. KRICKEBERG (1939, 167) even puts the beginning of the period about a century later.

<sup>2</sup> VAILLANT 1930, 77.

<sup>3</sup> KRICKEBERG 1939, 189.

<sup>4</sup> JIJÓN Y CAAMAÑO 1930, 195 seq.

author is influenced by the archaic theory of SPINDEN; we are here only concerned with the dating of the periods and the fact that maize was known as early as Panzaleo I<sup>1</sup>. The entire development before the Incas, who did not arrive in Ecuador till about 1450, is estimated by him at 2000 years. KRICKEBERG considers this exaggerated<sup>2</sup>. If the influences mentioned really came from Central America, as both JIJÓN Y CAAMAÑO and KRICKEBERG believe, he may be right in his criticism. It may be otherwise, however, if some of the parallels between Ecuador and Central America should be attributed to a common source in Colombia. Here the final decision must be left to the future.

The most thorough, relative chronology in South America is the one established in Perú. In his great work on the archaeology of the Andean regions MEANS gives the following summary<sup>3</sup>:

	Highland	Coast
1400 seqq. A. D. . . .	Inca Empire . . . . .	Inca Empire
1100—1400 A. D. . . .	Early Inca . . . . .	Late Chimú and Nazca
900—1100 A. D. . . .	Decline . . . . .	Decline
600—900 A. D. . . .	Tiahuanaco II . . . . .	Tiahuanaco II
100 B. C.—600 A. D.	Tiahuanaco I . . . . .	Early Chimú and Nazca
Before 100 B. C. . . .	Archaic and Migratory . . . . .	Archaic and Migratory

KRICKEBERG has raised the objection that too much time is allotted to the influence of the Tiahuanaco II culture in the coast land, i. e. the period of decline, so that the early periods there probably did not end till 800 or 900 A. D.<sup>4</sup> KROEBER does not recognize any degenerated or “epigonal” period at all after the Tiahuanaco horizon, but simply considers the so-called “epigonal” pottery poorly made or even archaic Tiahuanaco products<sup>5</sup>. TELLO has a somewhat similar view. It does not appear clearly whether KROEBER wants to place the early periods as a whole nearer to our own time. TELLO seems to fix the beginning of Early Nazca and Early Chimú as late as the 4th century A. D.<sup>6</sup> According to his view, however, the finds

<sup>1</sup> JIJÓN Y CAAMAÑO 1930, 151.  
<sup>2</sup> KRICKEBERG 1939, 222.  
<sup>3</sup> MEANS 1931, 47. UHLE’s dating differs only very little from that of MEANS.  
<sup>4</sup> KRICKEBERG 1939, 232.  
<sup>5</sup> KROEBER 1925, 212. Eiusd. 1926. 271. Eiusd. 1930, 14. KROEBER & STRONG 1924, 97 footnote 6, 118.  
<sup>6</sup> TELLO 1929, 26.



from Chongoyape and Paracas are older than the fully developed Chimu and Nazca cultures<sup>1</sup>. At Paracas TELLO found maize, two species of beans (*Phaseolus vulgaris* and *Ph. pallar*), sweet potatoes and manioc; there was only one variety of maize, “*de mazorca pequeña, bruna o negra y grano fino*”<sup>2</sup>. With every reservation as to the dating in mind, we seem safe in concluding that agriculture here goes at least as far back as the beginning of our era. Forerunners of the agricultural civilizations are not known on the coast. They appear suddenly and fully developed, probably as a result of an immigration. Previously there had been nothing but a primitive fishing culture which also persisted some time after the dawn of the new period<sup>3</sup>.

It has not yet been established where the civilizations on the Peruvian coast are rooted. There are some indications of an invasion from the north by sea<sup>4</sup>, and in this context it is important to bear in mind that one of the Chimu words for maize clearly belongs to the Colombian type. Nevertheless it is probable that from the very first the coastal civilizations were deeply influenced by the highland, and that an early agricultural civilization, older than those of the coast and characterized by the finds from Callejón de Huaylas, formerly existed in the mountains<sup>5</sup>. TELLO is of opinion that the Callejón de Huaylas period together with the subsequent Chavín period and the contemporaneous Paracas and Chongoyape cultures lasted for nearly a millenium<sup>6</sup>, and even though this is a very rough and uncertain estimate, it does not seem improbable that the beginning of agriculture in the Peruvian highlands should fall some time in the first half of the last millenium B. C.

If we compare this result with the one obtained for México, we cannot avoid noticing a certain agreement. In both cases agriculture, including maize cultivation, seems to appear about 1000 B. C. or shortly afterwards. This is not very consistent with the old view of the Mexican origin of maize, but it tallies very well with the hypothesis that it came from northern Colom-

<sup>1</sup> TELLO 1930, 263.

<sup>2</sup> TELLO 1928, 690. Eiusd. 1929, 164.

<sup>3</sup> UHLE 1910, 352 seq.

<sup>4</sup> MEANS 1931, 50 seqq.

<sup>5</sup> TELLO 1929, 24 seq., cf. 166 seqq. Eiusd. 1930, 263.

<sup>6</sup> TELLO 1929, 26.

bia, about midway between México and Perú. Corn growing must, of course, be older there than in the two other regions, perhaps from the middle of the 2nd millenium. On the other hand, this does not mean that American agriculture as a whole originated at this period, for as previously mentioned it is quite possible that the cultivation of tuberous plants such as arracacha, manioc and potatoes is still older. I do not believe, however, that it goes much farther back than about 2000 B. C.

The most conspicuous things often attract the attention to such a degree that the less easily perceived are overlooked or at least neglected. Far too often the late and well preserved monuments tempt the archaeologist, so that he forgets to look for the remains of earlier times. In this case the rich civilizations of México and Perú have overshadowed the poorer and more primitive culture of Colombia, although the latter probably holds the clue to some of the most burning problems in American prehistory. A thorough and systematic investigation of Colombia by archaeologists and botanists in close co-operation would no doubt prove to give results that in more than one way would elucidate the origin of American agriculture and, consequently, the very beginnings of the higher cultures in the New World.



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- A: Anthropos. Mödling b. Wien.  
 AA: The American Anthropologist. Washington. Lancaster. Menasha.  
 AAA-M: American Anthropological Association, Memoirs. Lancaster.  
 AAE: Archivio per l'Antropologia e la Etnologia. Firenze.  
 AfA: Archiv für Anthropologie. Braunschweig.  
 AGW-M: Anthropologische Gesellschaft in Wien, Mitteilungen. Wien.  
 AMNH-AP: American Museum of Natural History, Anthropological Papers. New York.  
 APhS-P: American Philosophical Society, Proceedings. Philadelphia.  
 BA: Baessler-Archiv. Berlin.  
 BAE-B: Bureau of American Ethnology, Bulletins. Washington.  
 E: Ethnos. Stockholm.  
 EMS-NS: Ethnographical Museum of Sweden. New Series. Stockholm.  
 ES: Ethnological Studies. Göteborg.  
 G: Globus. Braunschweig.  
 GR: The Geographical Review. New York.  
 GVVS-H: Göteborg Kungliga Vetenskaps- och Vitterhets-Samhälle, Handlingar. Göteborg.  
 GT: Geografisk Tidsskrift. København.  
 IAE: Internationales Archiv für Ethnographie. Leiden.  
 IEUT-R: Instituto de Etnología de la Universidad Nacional de Tucumán, Revista. Tucumán.  
 IGA-B: Instituto Geográfico Argentino, Boletín.  
 IJAL: International Journal of American Linguistics. New York.  
 KAWA-V: Koninklijke Akademie van Wetenschappen te Amsterdam, Verhandelingen. Afd. Letterkunde. Amsterdam.  
 MAI: Museum of the American Indian, Heye Foundation. New York.  
 -C: Contributions.  
 -INM: Indian Notes and Monographs.  
 MLP-R: Museo de La Plata, Revista. Buenos Aires.  
 MNM-A: Museo Nacional de México, Anales. México.  
 MNRJ-A: Museu Nacional, Archivos. Rio de Janeiro.  
 MP-R: Museu Paulista, Revista. São Paulo.  
 NYSM-B: New York State Museum, Bulletin. Albany.



- PMAAE-: Peabody Museum of American Archaeology and Ethnology.  
Cambridge, Mass.  
-M: Memoirs.  
-P: Papers.
- SAP-J: Société des Américanistes de Paris, Journal. Paris.
- SI-: Smithsonian Institution. Washington.  
-AR: Annual Reports.  
-MC: Miscellaneous Collections.
- SLP-M: Société linguistique de Paris, Mémoires. Paris.
- SSF-CHL.: Societas Scientiarum Fennica, Commentationes Humanorum  
Litterarum. Helsingfors.
- UC-PAAE: University of California, Publications in American Archae-  
ology and Ethnology. Berkeley.
- UP-AP: University of Pennsylvania, Anthropological Publications. Phi-  
ladelphia.
- USNM-: United States National Museum. Washington.  
-B: Bulletin.  
-R: Reports.
- Y: Ymer. Stockholm.
- ZE: Zeitschrift für Ethnologie. Berlin.

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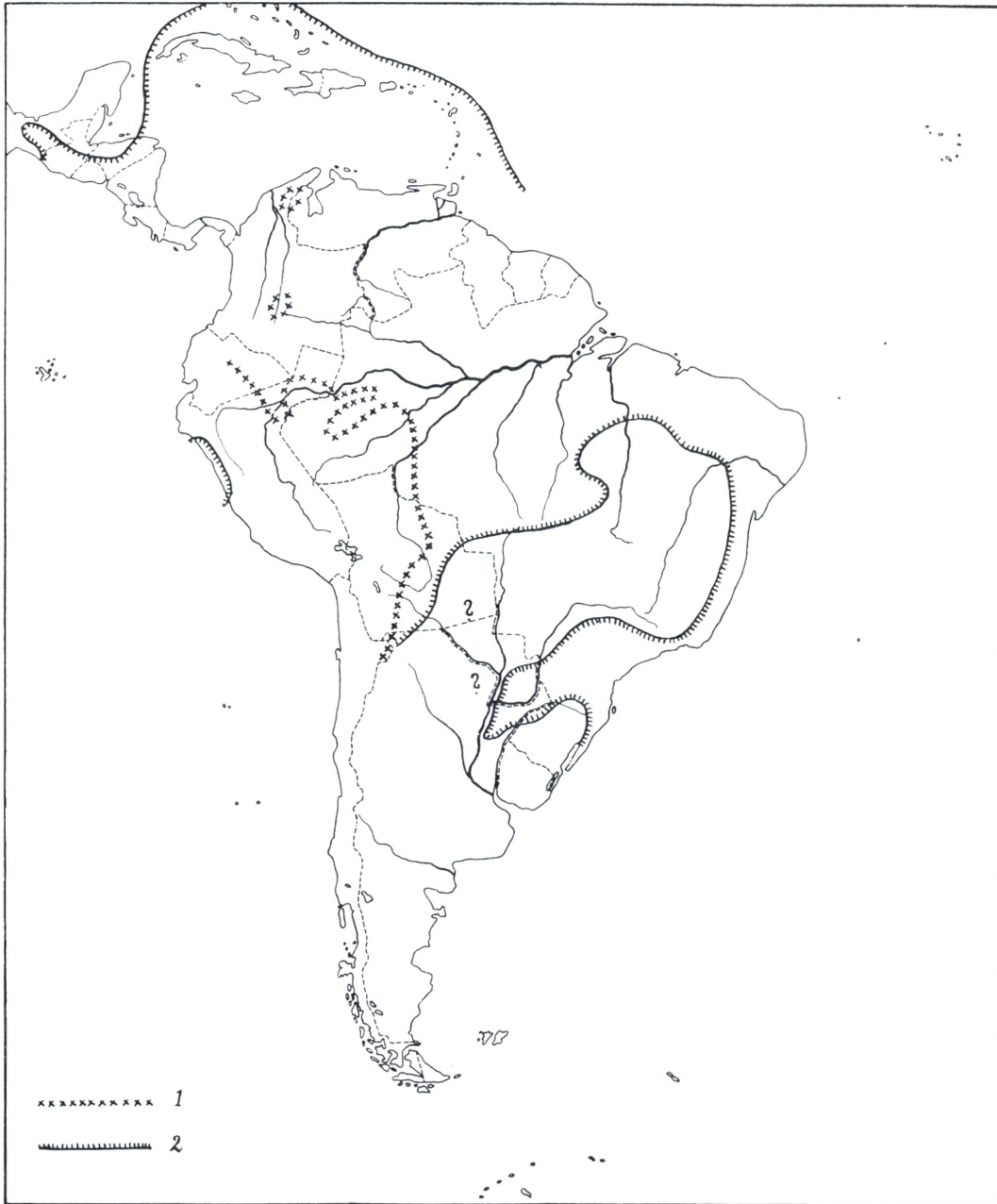
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Distribution of Maize Words in South and Central America. 1, maximum limit of Peruvian types; 2, maximum limit of Colombian types; ? ? problematic occurrences of Peruvian words in El Gran Chaco.

