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THE AGE OF MAIZE CULTIVATION IN ASIA (A REVIEW
OF HYPOTHESES AND NEW ETHNOGRAPHICAL,
LINGUISTIC AND HISTORICAL DATA)

All research concerning the centres of domestication of the crops and their diffusion plays an important role in the investigation of cultural history¹. One of the best examples of this kind of research is the problem of the age and place of origin of maize cultivation. The plant itself due to its great specialization is generally considered as being impossible to appear parallelly in diverse unconnected centres. Therefore it has a particular value to the above mentioned field of research and specially to the problem of possible Asia-America pre-Columbian relationships².

Before entering into the matter it seems necessary to mention shortly the principal hypotheses concerning the origin of maize (*Zea mays* L.) in its geographical aspect.

An actually growing wild representative of this species is not known up till now and the present cultivated maize completely depends in its survival from the human activity, due to the impossibility of spontaneous sowing.

The charcoal samples of maize discovered in the Bat Cave (New Mexico) represent two varieties³: pop corn (var. *everta*) and pod corn (var. *tunicata*) — considered to be the most primi-

¹ Gordon F. Ekholm, *The New Orientation Toward Problems of Asiatic-American Relationships*. 75-th Anniversary Volume of the Anthropological Society of Washington, Washington 1955, p. 99.

² Tomasz Marszewski, *Remarques sur l'état des recherches concernant les contacts entre les peuples de l'Asie et de l'Amérique précolombienne*, „Folia Orientalia“, II, 1960, Kraków 1961, p. 177.

³ Paul C. Mangelsdorf, C. Earle Smith, *A Discovery of Remains of Primitive Maize in New Mexico*, „The Journal of Heredity“, Vol. 40, No 2, February 1949, p. 43.

tive known types of the species. In the opinion of the majority of botanists these samples belong already to the cultivated forms. In any case as the radiocarbon date of the oldest specimens vary between 2000 and 3000 B. C.¹, while similar finds from Tularosa Cave (New Mexico)² are dated ca 1600 B. C. and from La Perra cave (NE Mexico)³ ca 2500 B. C. — we must consider, that it was already the time when the cultivation of plants has been started in America.

We see the special importance of the fossil pollen of maize, found in Mexico City in the layers dated according the glacial chronology for at least 60 thousands years⁴ — which may belong only to the wild species, grown „long before — writes Weatherwax⁵ — the beginnings of agriculture anywhere in America“. Of course we must still wait for the verification of the chronology and taxonomy of all these paleobotanical finds.

There are different hypotheses concerning the origin of maize: some of them admit an evolutionary process with eventual mutation, others — the cross-breeding of two akin species. Without entering into the botanical aspect of this problem it is only necessary to state that the majority of these hypotheses consider America as the only possible region of the world where this process could have taken place, as we are dealing there with the nearest relatives of maize: teozinte (*Euchlaena* sp.) and gama (*Tripsacum* sp.). This prevalent point of view is in the following manner summarised by Towle⁶: „Although no specimens of this ancestor of maize have been found, the plant is thought to have been originally widely dispersed throughout the temperate regions

¹ Gordon R. Willey, Philip Phillips, *Method and Theory in American Archaeology*, Chicago 1958, p. 128.

² Paul Weatherwax, *Indian Corn in Old America*, New York 1954, p. 146.

³ G. H. Bushnell, *Radiocarbon Dates and New World Chronology*, „Antiquity“, Vol. XXV, No 140, 1961, p. 285.

⁴ Igor Grebenščikov, *Mais als Kulturpflanze*, Wittenberg-Lutherstadt, 1959, p. 38.

⁵ Weatherwax, ib., p. 149.

⁶ Margaret A. Towle, *The Ethnobotany of Pre-Columbian Peru*, Viking Fund Publications in Anthropology, Number Thirty, New York 1961, pp. 20/21.

of South America, Central America and possibly Mexico, and at an early date was adopted by man as a crop plant. It has been postulated that either in one or more centers, before or after its domestication, this ancestral form crossed with species of a related genus, *Tripsacum*, producing hybrids that eventually developed into varieties of *Zea Mays*“.

The problem of the most probable location of the agricultural centre in which the wild progenitor of maize has been domesticated, evoked also several contradictory points of view. The specialists are divided in their opinions concerning the region of this continent where we have to search for this centre. The following areas have been considered seriously:

1. Andean region — the lower zone of mountains in Eastern Peru and Bolivia¹; 2. Savanna's region of N. Colombia²; 3. Highlands of E. Mexico or W. Guatemala³.

In spite of the conviction about the American origin of maize, prevalent among botanists, archaeologists and ethnographers, some geographers, e. g. Sauer and Carter, are inclined to less categorical statements concerning this problem. But we had even a hypothesis of Anderson⁴, who being a botanist did not exclude that the process of maize development could have taken

¹ P. C. Mangelsdorf, R. G. Reeves, *The Origin of Indian Corn and its Relatives*, Texas Agricultural Experiment Station, Bulletin 574, 1939, pp. 248; Johs Humlum, *Zur Geographie des Maisbaus*, Handelshøjskolen i København Skriftraekke A. I. København 1942 pp. 37—38; Carl O. Sauer, *Cultivated Plants of South and Central America*, Handbook of South American Indians, Vol. 6, Washington 1950, p. 493; P. M. Żukowskij, *Kulturnyje rastienija i ich sorodiczi*, Moskwa 1950, p. 128.

² Kaj Birket-Smith, *The Origin of Maize Cultivation*, Det Kgl. Danske Videnskabernes Selskab Historisk-Filologiske Meddelelser, Bind XXIX, No. 3. København 1943, pp. 32—34; C. Frank Hibben, *L'homme primitif américain*, Paris 1953, p. 262.

³ N. I. Vavilov, *Meksika i Centralnaja Amerika, kak osnovnoj centr proishozhdenija kulturnych rastenij Nowogo Sweta*, „Trudy po prikladnoj botanike, gienietikie i sieliekcii“, XXVI, Leningrad 1931; Morley Sylvanus Griswold, *The Ancient Maya*, Washington 1946, p. 140.

⁴ Edgar Anderson, *What is Zea Mays?*, A Report of Progress, *Chronica Botanica*, Vol. IX, 1945, pp. 88—90.

place in Asia — i. e. in Upper Burma — involving local species of Maydae. A strong opposition arose against this supposition. Even more moderate, like Grebenščikov¹, considered this possibility as almost inadmissible, as asiatic Maydae are morphologically too distant from maize.

Among the partisans of the American cradle of maize other questions have been discussed simultaneously: by which way this plant reached the Old World, when did it happen and who was responsible for it. The greatest diversity of opinions arose concerning the origin of maize cultivation in Asia. The extant hypotheses can be divided in different ways according whether they consider the trans-atlantic or trans-pacific introduction, the pre-Columbian or post-Columbian time of it and the role of the Portuguese (e. g. Merrill), the Spaniards (e. g. Mangelsdorf, Oliver), Arabs (e. g. Jeffreys), Polynesians (e. g. Stonor, Anderson) or Viets (e. g. Heine-Geldern) in this transplantation. Some specialists have guarded a precautious and awaiting position (e. g. Sauer, Hutton, Hatt, Carter).

It seems important to review the principal of these hypotheses as well as the opinions of some earlier authors. They will be presented in the chronological order as they often contradict each other with a great amount of arguments.

1. Crawford² — a British Resident at the Court of the Sultan of Java in 1808 — considering the wide distribution of maize and of its name *jagung* in Indonesia, as well the importance of its cultivation among the great tribes of this archipelago, concluded (1820) that this plant must be indigenous there.

2. Bonafous³ (1836) has agreed with the opinion of Santa Rosa da Viterbo, according to whom maize was introduced into Spain by the Arabs already in XIIIth century and he thought

¹ Grebenščikov, *Mais als...*, p. 33.

² J. Crawford, *History of the Indian Archipelago*, London 1820, p. 365, after: D. W. Jeffreys, *Pre-Columbian Maize in Asia*, „The Eastern Anthropologist“, Vol. IX No 1, Sept.-Nov. 1955, p. 21.

³ Matthieu Bonafous, *Histoire Agricole et Economique de Maïs*, Paris 1836, p. 1, after: D. W. Jeffreys, *Pre-Columbian Negroes in America*, „Scientia“, VII—VIII, 1953, p. 216 and Weatherwax, *Indian Corn...*, p. 132.

that independently of the American form of this plant there existed also an Asiatic one.

3. Royle¹ — Late Superintendent of the Botanical Garden at Saharunpore — has been already convinced (1846) that „The Portuguese probably introduced into India“ maize among some other products of America. The same author has also stated about the maize growing in India that it: „is not cultivated to the extent“² and: „In the most Northern parts we have cultivation of Rice, Sorghum, Indian Corn, and other tropical grains...“³.

4. Watt⁴ — a reporter on economic products attached to the Government of India — has expressed (1893) the following opinion as regards the introduction of maize to this country: „There can be no doubt but that maize came to India from America and that it was cultivated for at least 100 years before forms were obtained for each tract of country of sufficient merit to justify extensive cultivation. But when India had in time evolved its own forms, maize moved rapidly over the length and breadth of this vast continent“. Further he emphasizes that this plant is already cultivated „on the swamps of Eastern Bengal, on the sandy desert tracts of Central India and Rajputana, in the humid temperate portions of the Eastern Himalaya, and in the drier and colder tracts of the western ranges even to Yarkand, Herat and Tibet“. Watt⁵ in support of his conviction pointed to the lack of information about the maize cultivation in India: in the administrative report for the year 1590 composed by Abal Fuzl⁶ for the court of Akbar — where we find only an allusion to this crop as compared to another plant; in the relation of Linschoten⁷ — „one of the most painstaking Indian explorer“ of the

¹ J. F. Royle, *Essay on the Productive Resources of India*, London 1846, p. 40.

² Royle *ib.* p. 381.

³ Royle, *ib.* p. 442.

⁴ George Watt, *A Dictionary of the Economic Products of India*, Vol. VI, Part IV, London—Calcutta 1893, pp. 329, 334.

⁵ Watt, *ib.* p. 334.

⁶ *The Ain-i-Akbari* by Abal Fuzl'Allami, translated from the original Persian by N. Blochmann, Vol. I, Calcutta, 1873, p. 83.

⁷ *Itinerario voyage ofte shipvaert van Jan Huyghen van Linschoten neuer Oost ofte Portugails*, Amsterdam, 1595.

XVI-th century; and even in the works of Burmann¹ — a botanist of the XVIIIth century — on the flora of India and Ceylon. As proof of comparatively late development of maize cultivation in these countries, Watt is quoting Roxburgh's² statement of 1832: „cultivated in various parts of India in gardens, and only as a delicacy, but not anywhere on the continent of India, so far as I can learn, as an extensive crop“. Nevertheless Watt³ reminded also the account of Hamilton (1819)⁴ in which this author mentions about the maize cultivation in some regions of Western Himalaya (i. e. in the state of Yumila and in Kangra, where „The poor people live much on maize“) as well as the Catalogue of Graham (1839)⁵ where is stated about the common cultivation of maize in Western India. In final conclusion Watt⁶ writes: „It is thus very probable that in Upper India (a region, comparatively speaking, unknown to Roxburgh) maize was much more extensively grown at the beginning of the century than might be inferred from Roxburgh's words“. As concerning the introduction of maize to China, Watt thinks that it may have been done by „navigators from America or from Europe“ during the period between the arrival of the Portuguese to this country in 1516 and the references about this crop in the Chinese sources from the end of the XVIth century.

5. Laufer at the fifteenth International Congress of the Americanists held at Quebec in 1906 has exposed in detail his point of view on the introduction of maize into Eastern Asia⁷. According to this sinologist there are no historical documents

¹ *Thesaurus Zeylanicus and Flora Indica*.

² William Roxburgh, *Flora Indica or descriptions of Indian Plants*, Serampore 1832, p. 568.

³ Watt, *A Dictionary...*, pp. 334/335.

⁴ Francis Hamilton (formerly Buchanan), *An Account of the Kingdom of Nepal, and of the territories annexed to this dominion by the House of Gorkha*, Edinburgh 1819, pp. 284, 312.

⁵ J. Graham, *A Catalogue of Bombay Plants*, Bombay 1839.

⁶ Watt, *ib.* p. 335.

⁷ Berthold Laufer, *The Introduction of Maize into Eastern Asia*, Congres International des Americanistes, XV-e session tenue à Quebec en 1906, Quebec 1907, I, pp. 223—257.

testifying that maize has been carried to China through the sea by the Portuguese, Spaniards or Chinese. He is pointing out also that this crop is several times mentioned in Chinese written sources of the second half of the XVIth century and that in the oldest of such reports, written by a Chinese scholar T'ien-I-heng, it is said that it has been first introduced to China from Tibet. Laufer is quoting also from the work of Gonzales de Mendoza printed in Rome in 1585, the relation of some Augustians concerning the cultivation of maize in Fukien in the year 1577. From its extension Laufer has assumed that this crop must have reached Fukien ca 1560 (not later than ca 1570) and Western China ca 1540. According to him it has been transferred to this region through the primitive tribes which could have received it from India. There it has been introduced — he suggests — most probably by the Portuguese or eventually by the Arabs, who may have got it from the Spaniards.

6. Wagner¹ in spite of the conviction of other experts has expressed (1926) the opinion that in Chinese chronicles we can find an indication that the first introduction of maize to China has been done by the Portuguese in the XVIth century. The maize illustration in Pen-tsao-kang-mu cannot be according to him the proof of its pre-Columbian introduction to Eastern Asia, as this herbal has been compiled between 1552 and 1578. Further, he remarks that among the *wu-gu* — the five main grain-cereals mentioned in Chinese classic literature maize is not included. He points out also that throughout China only the small-kerneled variety has been first cultivated what is not in favour of the hypothesis of its great antiquity in this region, as it indicates that there was no time for the varietal differentiation. The same conclusion is for him authorised by the lack of proper names for maize in Chinese and Japanese, as it has been known only under the composite names like *yü-shu-shu* („gemlike millet“) and *fan-mai* („barbarian corn“) in the first of these languages, and *nanban-kibi* („southern barbarian's millet“) in the second, while *nan-ban* designated first of all the Portuguese.

¹ Wilhelm Wagner, *Die chinesische Landwirtschaft*, Berlin 1926, pp. 307—308.

7. Kuleshov¹ has pointed out (1928) that some characters of the Asiatic form of maize, which are either unknown or very rare in American ones (i. e. waxy endosperm, tendency to brachyms, ligulness etc.), as well the vast area of distribution of these characters (Transcaucasia, Turkestan, Manchuria, China, Burma, Philippines) are in favour of the hypothesis of the pre-Columbian introduction of this crop into Asia. It would be according to him difficult to admit that during 300—400 years the American varieties had time to penetrate into such wild countries, as for instance Upper Burma, and produce by mutations these peculiar characters.

8. Humlum² following Laufer's hypothesis has admitted that the Carribean and Peruvian maize, introduced to the Mediterranean area in post-Columbian times, was rapidly spread by the Portuguese along the coast of North Africa, and then to India and Indochina from where, still in the course of the XVIth century, through Burma it reached Western China. Concerning its introduction into Western Africa, he pointed to some evidences of its probable presence in Angola around the year 1500.

9. Finan³ has emphasized (1948) that two types of maize are discussed in the herbals of the XVIth and XVIIth century — one mostly called *Fruementum Turcicum* and suspected to have been brought into Europe from Asia; another — *Fruementum Indicum*, considered as possibly introduced from the Carribean area by the Spanish explorers. The first type, illustrated already in *De historia stirpium* (1542) of Leonard Fuchs, is similar according to Finan to the flint corn (var. *indurata*) of eastern regions of North America. Whether it has originated in this area, as suggested by the legend about the Norsemen (Thorfinn Karselfni) — believed to have reached the present Massachusetts region in the years 1002—1006 and to have brought maize from there, or is it an as-yet unknown tropical variety, perhaps also from the Carribean — is for Finan a matter of further study.

¹ N. N. Kuleshov, *Some Peculiarities in the Maize of Asia*, „Trudy prikladnoj botanike, genetike i selekcii, XIX, 2, 1928, pp. 370—374.

² Humlum, *Zur Geographie...* pp. 24, 29, 74.

³ John Finan, *Maize in the Great Herbals*, Annales of the Missouri Botanical Garden, XXXV, 1948, pp. 149—183.

2. Stonor and Anderson¹ joining the results of the ethnographical investigation (including linguistic data) of the first author in the mountains of Assam and the botanical research (phytogeographical, morphological and cytological) of the latter — have elaborated a tentative hypothesis (1949) concerning the first introduction of maize into Asia. Stonor² emphasized that in the economical life of various mountain tribes of Assam and adjacent regions different varieties of maize, along with Job's tears and sorghum, play a more or less important role and maize is also considered as one of the ancient crops. „The wide distribution in the area, — writes Stonor — the traditions and positive statements of the peoples themselves, the existence of tribal names, and the place of maize in their religions all point to a long history in this region, going back for centuries at least and most probably antedating rice culture there“.

Anderson³ indicated that the Assamese varieties of maize as a whole represent a complex of morphological and physiological characters which is unknown in Central America, and in South America appears contemporarily only in mixtures in certain primitive pop corns (N. Chile, Argentine, E. Bolivia). But he pointed out also that the varieties (race A) with similar cobs and small kernels were the only type of maize along the west coast of South America up to the late Ica period when the large-seeded types (race B) of the Andean region have dominated. Simultaneously he remarked⁴ that varieties similar to Assamese were „widely, though spottily distributed from Persia and Turkestan to Tibet and the Island of Hainan nearly always among primitive and conservative peoples“. Then, in conclusion he⁵ wrote: „To believe that in post-Columbian times maize could have penetrated not only to the Naga but to the hill tribes of Upper Burma, and of Siam; to the Lolo in Central Asia, to the aborigines of Hainan,

¹ C. R. Stonor — Edgar Anderson, *Maize among the Hill Peoples of Assam*, Annales of the Missouri Botanical Garden, XXXVI, 1949, pp. 355—356.

² Stonor — Anderson, ib. p. 394.

³ Stonor — Anderson, ib. pp. 386/387, 390, 394.

⁴ Stonor — Anderson, ib. p. 395.

⁵ Stonor — Anderson, ib. p. 390.

to the hill peoples of Sikkim, and to the interior of New Guinea, in each case passing over the more civilized peoples along the coast is beyond the credulity". Finally in agreement with Stonor he admits¹ that most probably there have been two major introductions of maize into Asia. The first — of the primitive pop corn types (race A), which must have been carried across the Pacific in one or opposite direction in pre-Columbian times, may be by the Polynesians; the later — of the Carribean type (race C) — across the Atlantic in post-Columbian times by the Europeans.

10. Hutton in his review (1950) of Stonor-Anderson hypothesis discussed above wrote²: „... that too much weight must not be attached to statements that maize or certain sorts of maize have been known to hill tribes from time immemorial.“, being inclined to admit³ „that maize, like rice, is not one of the grains most anciently cultivated by Naga and Kuki tribes“. According to him „... any decision as to whether maize is indigenous to Asia, or was imported from America in pre- (or post-) Columbian days, must rest on botanical or conceivably on archaeological rather than on ethnographical evidence“.

11. Mangelsdorf and Oliver⁴ have been engaged (1951) in a polemic with the Stonor-Anderson hypothesis. — Mangelsdorf emphasized⁵ that we know too little about the maize varieties grown in Asia to conclude that the varieties cultivated by the hill-tribes of Assam are not represented somewhere in the lowlands and along the sea-coasts of this continent, as stated by Anderson. It is quite possible for Mangelsdorf, that these varieties have been there replaced by the Carribean type of maize. According to him it is also difficult to believe that, if maize was cultivated in Asia in pre-Columbian times, there would be no mention about such a useful and peculiar plant in the records of the civilized peoples

¹ Stonor — Anderson, *Maize among...* pp. 356, 391/392, 395.

² J. H. Hutton, in review of: Stonor — Anderson, op. cit. — „Man“, Vol. L, Nov. 1950 art. 250, p. 153.

³ Hutton, ib. p. 154.

⁴ P. C. Mangelsdorf — D. L. Oliver, *Whence came Maize to Asia?*, Harvard University, Botanical Museum Leaflets, Vol. 14, No 10, Cambridge 1951, pp. 263—291.

⁵ Mangelsdorf — Oliver, ib. pp. 274/275.

of the Old World and no traces in the archaeological materials from this area, as is the case. Mangelsdorf has also pointed¹ out the striking morphological and genetical similarities among the mountain maize of Assam and the pop corns of Colombia, known from the Caldas province (Cauca Valley) as well the neighbourhoods of Bogota and Buenaventura. Then, suggesting the genetical relationship between these two sets of varieties and supporting Laufer hypothesis he concluded²: „Colombia, for example, where living counterparts of the Assamese maize are known to occur, is actually appreciably nearer to Assam via the Carribean Sea, the Atlantic Ocean and Africa than via the Pacific. Furthermore, the first route being more largely a land route, does not demand the fabulous feats of navigation on the part of pre-Columbian people which the second does“.

Oliver³ has pointed out — giving examples from other regions of the world — that the traditions of some mountain tribes of Assam about the old cultivation of maize cannot be a proof of its antiquity. He emphasized also the lacunas in the linguistic and other arguments presented by Stonor in favour of it.

In the final conclusion Mangelsdorf and Oliver⁴ admit that maize — may be — had been introduced into Asia twice: „once in early post-Columbian times from the west by a land route, and a second time, perhaps somewhat later, when tobacco and the potato were also introduced from the east by seafaring people“.

12. Hatt⁵ has contradicted (1951) Laufer's hypothesis concerning the diffusion of maize cultivation in the Old World. First of all he pointed out that the acceptance of the date 1540 — as presumed by Laufer — for the introduction of maize into Western China from Tibet, means that this plant must have travelled from Spain to India and across the Himalaya in less than 50 years and then in less than 30 years acquire an extensive cultivation in China, as it is indicated by the relation of Mendoza. Therefore,

¹ Mangelsdorf — Oliver, ib. pp. 268, 269, 273, 276, 288.

² Mangelsdorf — Oliver, ib. p. 276.

³ Mangelsdorf — Oliver, ib. pp. 280, 281, 284—286.

⁴ Mangelsdorf — Oliver, ib., p. 289.

⁵ Gudmund Hatt, *The Corn Mother in America and in Indonesia* „Anthropos“, Vol. XLVI, No 5—6, 1951, p. 903.

doubting in the possibility of such a rapid dispersal of this plant he wrote: „... prehistoric research have not disclosed any such lightninglike rapidity in the spread of the Old World's prehistoric cereals“. Hatt emphasized¹ also that Anderson's² research concerning the variety of maize from Rio Loa in Northern Chile and its prehistoric counterparts of the same region as well contemporaneous Asiatic ones „suggests very strongly a pre-Columbian transfer of maize between the Orient and Western South America“. Nevertheless, we cannot according to him³ find it as proved and the solution of this problem is for him a matter of further investigations „which should also be taken up by archaeologists“.

13. Sauer⁴ has expressed (1952) his disagreement with the supposition that maize cultivated as an important crop in China in the second half of the XVIth century was introduced there in the post-Columbian times, after travelling from Spain through the Mediterranean countries and South Asia. The rapidity with which it should have spread over these vast areas, is for him improbable. Sauer⁵, being inclined to admit that maize has been carried across the Pacific in pre-Columbian times, does not think that in would be possible at present to decide in which direction this transplantation took place, „as long — he writes⁶ elsewhere — as certain matters concerning South-Eastern Asia remain unsolved“.

14. Carter in the discussion concerning the place of maize domestication and the dispersal of its cultivation, has expressed (1953) a moderate point of view and concluded⁷: „The possibility that maize is American remains. It seems probable that it was carried between the Old World and the New World in pre-Columbian times“. In the polemic between the two teams: Stonor-Anderson and Mangelsdorf-Oliver, he was likely to take the side

¹ Hatt, ib., p. 902.

² Edgar Anderson, *A Variety of Maize from Rio Loa*, Annales of the Missouri Botanical Garden, XXX, 1943, pp. 469—474.

³ Hatt, *The Corn...*, p. 904.

⁴ Carl O. Sauer, *Agricultural Origins and Dispersals*, New York 1952.

⁵ Sauer, ib., Map II.

⁶ Carl O. Sauer, *Cultivated Plants...*, p. 494.

⁷ George F. Carter, *Plants Across the Pacific*, Memoirs of the Society for American Archaeology, No 9, Salt Lake City, Utah, pp. 68/69.

of the first and he emphasized¹ the carefulness of their statements. He pointed² also that the papers of Finan (1950) and Hatt (1951) tend to support Anderson's hypothesis. Mangelsdorf's hypothesis of the overland introduction of maize into Asia through Africa in post-Columbian times, seemed to be for him³ difficult to accept, considering that this plant could have been in China already by 1540. Concerning the lack of mentions about maize in the ancient literature of Asiatic peoples, as well, of the archaeological finds of it in the Old World — pointed out by Mangelsdorf — he remarked that this literature has not been studied as yet with an „ethnobotanical insight“, while very little archaeological investigations has been done in South-Eastern Asia.

15. Jeffreys in several papers (1953, 1955) exposed some facts which are according to him the evidence of pre-Columbian cultivation of maize in Africa and Asia, as well his attempt to explain its origin.

First of all he has pointed out⁴ that Pereira — a Portuguese pilot in his *Esmeraldo de situ Orbis* (published before 1509)⁵ mentions maize cultivation ca 1505 among the natives on the Rio Grande, around Cape Verde and at Sierra Leone but he does not suggest that it was introduced by the Portuguese. Elsewhere he wrote⁶: „Monood, Teixeira and Mauny in their account of Valentin Fernandez's visit to West Africa prior to 1506, report his statement that *milho zaburro* flourished in San Tomé where it was planted for the first time in 1502, having previously been shipped thither from the coast of Guinea“. To prove that *milho zaburro* is maize, Jeffreys has quoted⁷ the relation of Soares de Sousa

¹ Carter, ib., pp. 66, 68.

² Carter, ib., p. 66. ³ Carter, ib., p. 68.

⁴ Jeffreys, *Pre-Columbian Negroes...*, p. 215.

⁵ Transl. G. H. T. Kimble, Hakluyt II Series, Vol. LXXIX, London 1937, pp. 92, 94, 99.

⁶ Jeffreys D. W., *Pre-Columbian Maize in Africa*, „Nature“, 172, Nov. 21, 1953, p. 966.

⁷ Jeffreys, ib., p. 966 after: G. Soares de Souza, *Tratado descriptio do Brazil en 1587*, Rio de Janeiro 1879: „Dá-se autro mantimento, em todo o Brazil, natural da mesma tena, a qui os indios chamam ubatim, que é o milho de Guiné, que em Portugal chamam Zaburro...“.

(1587) in which this author states that the plant called by the natives of Brazil *ubatim* is *milho de Guiné* — called in Portugal *zaburro*. Further Jeffreys emphasized that these two last names are still applied for maize: the first one in Brazil, the second one in Portugal. (We may add here that in the list of tribal names of maize from South America — presented by Birket-Smith¹ — we find *ubatim* as one of the two words used by „Coast Tupi“). According to Jeffreys² it would be difficult to admit that maize brought by Columbus to Spain probably in 1496 (eventually in 1494 as the earliest possible date) reached the western coasts of Africa — forbidden to him and to Spaniards — so rapidly and acquired an extensive cultivation among the tribes of hostile attitude toward the Europeans, which did not facilitate an exchange of food plants.

Jeffreys has pointed out³ also, that the recent archaeological finds at Ife (pots sherds decorated by rolling of maize cob over the wet clay) seem to confirm the pre-Columbian cultivation of this crop in West Africa. After some Yoruba historical traditions — quoted by him from the literature on this subject — maize was introduced by a yellow-skinned foreigner from the North-East (Burton 1863), the tribe Kesi was the first to cultivate this plant (Moore 1916) and the early centre of its diffusion was Ile Ife (Babalola 1952). Considering that Ile Ife is supposed to have been founded by a wave of immigrants from the East between 600 and 1000 A. D. (Talbot 1926) and the next capital of Yoruba — the Oyo, to have been established ca 1100 A. D. — Jeffreys thinks that just about these two last dates maize could appear among the Yoruba. More so, his research on the tribal names of maize in Nigeria confirms, according to him, the Yoruba tradition of the north-eastern introduction of this plant, as in several cases „the name for maize in tribe A is „sorghum of tribe X“, where X is found ultimately to be the name of a tribe east or north of the receiving tribe A“. Jeffreys believes⁴ also in the pre-

¹ Birket-Smith, *The Origin of Maize...*, p. 25.

² Jeffreys, *Pre-Columbian Negroes...*, pp. 215/216: Idem, *Pre-Columbian Maize in Africa*, pp. 965/966.

³ Jeffreys, *ib.* p. 965.

⁴ Jeffreys, *Pre-Columbian Maize in Asia*, p. 21.

Columbian cultivation of maize in Asia, but he disagrees with the Crawford's supposition that this plant is indigenous to Indonesia, as well with the hypothesis of Stonor and Anderson of its transplantation across the Pacific. The proofs of its antiquity in this part of the world are to be found for him in: „Pigafetta's account of Magellan's voyage to Philippines“, where according to him¹ there are some allusions to maize cultivation among the natives; the relation of Chu-fan-chi, a Chinese historian of the XIIIth century, concerning Tonkin, where the name of one plant cultivated in that area may refer to maize²; the relation of father Mendoza about an extensive cultivation of this crop in Fukien about the year 1575; and two Chinese sources of the second half of XVIth century, where the introduction of maize to China from Si-fan is mentioned but the period at which it occurred is not stated³. „It is evident — writes Jeffreys — that its introduction must have taken place at a very early period, as at the time when those works were compiled, no information could be procured“. Jeffreys⁴ being in full agreement with the Laufer's hypothesis of the overland dispersal of maize in Asia, has not, nevertheless, identified⁵ Si-fan with Tibet but after Hance and Mayers (1870) with Inner Mongolia. Following these two authors he excluded⁶ also the possibility of the introduction of maize into China by the Portuguese, who appeared for the first time on the coast of this country in 1517, being in subsequent years in hostile relations with Chinese, and not until 1557 settled in this region of Asia i. e. after the foundation of Macao colony.

Summarizing, according to Jeffreys⁷ only Arabs who during the XIIth and XIIIth century „dominated the Caravan tracts of the Near East and also the sea ways of the Indian Ocean“ and preceded Europeans in Indonesia, Philippines, China coasts etc. may be responsible for the pre-Columbian introduction of maize

¹ Jeffreys, *ib.*, pp. 23/24.

² Jeffreys, *ib.*, pp. 21/22.

³ Jeffreys, *ib.*, p. 26.

⁴ Jeffreys, *ib.*, p. 22.

⁵ Jeffreys, *ib.*, pp. 26/27.

⁶ Jeffreys, *ib.*, p. 25.

⁷ Jeffreys, *ib.*, pp. 22/23.

into Africa as well as into Asia. He thinks that it is reflected¹ in the distribution of the Carribean type of maize, which — quoting from Anderson's paper, seems to be prevalent in Philippines, widespread in the lower levels and along the coasts of Asia and present even in Naga Hills. Finally Jeffreys suggests² that maize was brought to China through the Great Silk Road; to Philippines — by sea.

As concerning the enigma as to from where and when Arabs could get the Carribean type of maize, Jeffreys³ admits that this plant along with manihot was brought by them during their — presumed by him — slave-trading contacts with America, supposed to begin about 900 A. D. To prove these contacts he presents a great amount of data, i. e. the activity of Arab navigators on the Atlantic, some cultigens and other items common to West Africa and America, eventual evidence of pre-Columbian Negroes in America etc.

16. Merrill in one of his papers (1954) has strongly opposed all attempts to see the introduction of maize into Asia in pre-Columbian times. First he directed⁴ his attack against Stonor — Anderson hypothesis reminding that it was also criticized by Mangelsdorf and Oliver (1951). Merrill points out⁵ that the Colombian forms of maize compared by Mangelsdorf with Assamese varieties, occur within the Atlantic water-shed, not on the Pacific side. According to him⁶ „Assam popcorn never crossed the Pacific“ but was carried by Portuguese directly from Eastern Brazil — where similar varieties can be still cultivated — to Goa (after 1500) and from there spread to North India. He also admits⁷ that some

¹ Jeffreys, *ib.*, p. 23; comp. Stonor — Anderson, *Maize among...*, p. 383.

² Jeffreys, *ib.*, pp. 23—25, 27.

³ Jeffreys, *Pre-Columbian Negroes...*, pp. 202—217; *Idem*, *Pre-Columbian Maize in Africa* p. 966; *Idem*, *Pre-Columbian Maize in Asia*, p. 27.

⁴ Elmer Drew Merrill, *The Botany of Cook's Voyages and its Unexpected Significance in Relation to Anthropology, Biogeography and History*, *Chronica Botanica*, Vol. 14 No 5/6, 1954, pp. 188, 277, 278, 289.

⁵ Merrill, *ib.*, p. 289.

⁶ Merrill, *ib.*, p. 189, comp., pp. 192, 193, 237, 261.

⁷ Merrill, *ib.*, p. 365.

early introductions of maize to Burma and Siam could be equally done by them. Merrill emphasized¹ therefore the importance of the old maritime route leading through the Cape of Good Hope, initiated by Portuguese in 1500 and continued up to 1665, as well of their great activity on the Indian Ocean and Chinese Sea, antedating that of Spaniards who operated from the western coast of Mexico and begun the colonisation of Philippines in 1565. Merrill supposes² the same origin may be accepted for the earliest maize in China, which according the Chinese literature of the XVIth century was brought from the West by the land route. Nevertheless he wrote³: „The Tibet idea seems very unrealistic, as almost all of that country is so high that the low altitude form or forms of maize, originally introduced from America by the Spaniards and the Portuguese, would not grow there“. He considered⁴ more probable the possibility that maize, introduced by Portuguese to Goa, travelled along one of the caravan routes to the Eastern Mediterranean region and from there reached Europe (where it was named *Fr. Turcicum* and *Fr. Indicum*) as well through the Silk Road — China. He points out⁵ that a pop corn type was brought, most probably from India to China — which is suggested by the description of some Indian forms by Roxburgh (XIXth c.) and one early Chinese form by Li-shih-chen (XVIth c.) — while other types could have been introduced later from Mexico through Manila and may be still others through the Portuguese colonies at Canton and Macao.

Concerning the introduction of maize to the Philippines, Merrill⁶ remarks that it might have been done for the first time during one of the Spanish expeditions from Mexico in the years 1526, 1527 and 1542. He disagrees also with some attempts to recognize maize in one of the plants listed in the account of Pigafetta, as cultivated by natives of Cebu. Merrill has rejected completely the possibility of early medieval transplantations of maize

¹ Merrill, *ib.*, pp. 188, 189, 192, 193, 237, 261.

² Merrill, *ib.*, pp. 290, 373.

³ Merrill, *ib.*, p. 289.

⁴ Merrill, *ib.*, pp. 289, 366, 367.

⁵ Merrill, *ib.*, pp. 237, 290, 373.

⁶ Merrill, *ib.* pp. 364—365.

from North America to Europe by Vikings (Finan) and from the Carribean region to Africa by Arabs (Jeffreys). The first is impossible for him because of the climatical obstacles¹; the second would have caused a wide distribution of this plant in Indo-Malaysia already before the year 1500 which has not been noticed². Nevertheless he does not exclude³ the eventuality of pre-Columbian introduction of maize from America to Africa „which considering the relatively short distance between the buldge of Brazil and Africa is of course possible...“

17. Weatherwax expressed⁴ (1954) a similar point of view. According to him a primitive form of maize could have been introduced by the Portuguese — probably directly from Brazil to India or Burma — then spread northwards to the mountain regions where it has been well adapted to the primitive method of cultivation of the natives, and from there finally reached China. As to the Carribean and Mexican varieties he supposes that they were first introduced into the Philippines and then brought into the mainland of Eastern Asia. „At present — Weatherwax concludes⁵ — we are not aware of a single plant fragment, artifact, illustration, written record, or other concrete evidence of the plant in Asia earlier than about seventy five years after it could have been taken to eastern India from Brazil“. He holds⁶ a quite sceptical attitude toward the discussed possibility of the introduction of a certain type of maize into the Europe by Vikings. Similarly he ascribes⁷ the introduction of maize into the West Africa to the martitime activity of the Portuguese in the early years of XVIth century. He points out⁸ that this crop and sorghum — both named by the Portuguese *milho* have been for a long time confused in travel literature.

18. Heine-Geldern devoted much place in one of his papers (1958) to the polemic concerning the origin of maize cultivation

¹ Merrill, ib., p. 366.

² Merrill, ib., pp. 318, 319, 373, comp. pp. 261/262.

³ Merrill, ib., p. 212.

⁴ Weatherwax, *Indian Corn...* pp. 34/35, 135/136.

⁵ Weatherwax, ib., p. 136.

⁶ Weatherwax, ib., p. 30.

⁷ Weatherwax, ib., pp. 34/35.

⁸ Weatherwax, ib., pp. 5, 164.

in Asia. He considers the following are in favour of Stonor-Anderson hypothesis¹: the differences between the mountain varieties of Asiatic maize and the Carribean maize, as well some similarities between the first and the prehistoric Peruvian maize; the fact that the cultivation of maize in India did not spread over the country until the XIXth century, while in Himalaya it had developed sooner; the extensive cultivation of this plant in Tibet in the middle of XVIth century and thereafter in China — against this hypothesis: the fact that the earliest known Chinese record about it is later than the first arrival of Portuguese to India and to China. Also the traditions of the maize cultivation among the hill tribes do not represent for him² a real proof of its antiquity. Finally, he does not consider³ as probable that maize was brought to Asia by the Polynesians, who — according to him — played only a little role in the transplantation of cultural items between the Old and the New World. Nevertheless the supposition that maize was first introduced into Asia by the Portuguese — upheld by Merrill and Weatherwax — involves for him⁴ several unsolved problems. Could Assamese and akin varieties evolved under the influence of climate and soil from the Carribean forms introduced by the Europeans and did Portuguese in the beginning of the XVIth century find on the coast of Brazil varieties corresponding to the first — it can be disentangled — he states⁵ only by the botanists. Are there documents proving that Portuguese introduced maize to South India and that it was done directly from Brazil — may be for him⁶ answered definitely by the historians of colonisation. Was it possible that maize — if introduced to South India, which could take place at earliest by 1503 after the settlement of the Portuguese at Cochin — has crossed the whole country and Tibet to be extensively cultivated in Fu-

¹ Robert Heine-Geldern, *Kulturpflanzengeographie und das Problem vorkolumbischer Kulturbeziehungen zwischen Alter und Neuer Welt*, „Anthropos“, Vol. LIII, No 3—4, 1958, p. 373; comp. p. 370.

² Heine-Geldern, ib., p. 367.

³ Heine-Geldern, ib., p. 365.

⁴ Heine-Geldern, ib., p. 367, 368.

⁵ Heine-Geldern, ib. pp. 366—368, 370.

⁶ Heine-Geldern, ib., pp. 370; comp. p. 392.

kien by 1577 — Heine-Geldern tries¹ to answer himself. The time seems to him be too short and the conditions in India (the conquering character of early endeavours of the Portuguese, several native states fighting with each other etc.) unfavourable for such diffusion. Eventually, it would be possible — he remarks — that this introduction took place when the Portuguese settled at Canton in 1516 but the testimonies of Chinese authors of the XVIth century point out distinctly that it has been done from the West. Heine-Geldern contradicts² also the objections of Mangelsdorf. As concerning the lack of references about maize in ancient literature — he remarks that other useful plants were treated similarly, for instance coco-palm known from the Arikamedu excavations, while the area where the race A is grown at present was even long after 1500 unknown in a great portion to the European, Arabic and Chinese travellers. From the lack of archaeological specimens of maize in that area, we cannot judge according him, considering that Assam, Burma and Tibet are still unexplored from this point of view; Vietnam and South China — only very little; while Persia, Central Asia and Eastern Siberia are — maybe — the regions to which the race A spread later. The possibility that Spaniards introduced the primitive Colombian forms of maize into Asia should be³ excluded, as they could not be acquainted with them until 1536—1539, and that the better Carribean varieties were known sooner in the Old World.

According to the hypothesis proposed by Heine-Geldern⁴ maize could have been brought by the representants of Dongson culture — during their supposed transpacific voyages to South America, eventually reaching also Colombia — and introduced to the North Vietnam lowlands from where it disappeared as it could not compete with rice, but it spread in mountain regions up to the interiors of Asia — well suited to the burn cultivation of the aboriginal tribes.

¹ Heine-Geldern, *ib.*, pp. 370—372.

² Heine-Geldern, *ib.*, pp. 393—394.

³ Heine-Geldern, *ib.*, pp. 395—396.

⁴ Heine-Geldern, *ib.*, pp. 396: comp. pp. 367, 392.

Now we can approach the confrontation of the different data which are or should be considered in the investigation concerning the origin of maize cultivation in Asia. It is necessary to emphasize here that the most important of them: the paleobotanical and archaeological data are not as-yet discovered in the above mentioned area, eventually such finds were not up till now published¹. Next in importance i. e. the data extracted from the historical sources — are known for a few regions only and they are mostly vague or fragmentary. Then, the ethnographical, linguistic and botanical data have been collected for many regions of Asia and adjacent islands, nevertheless they range from very detailed informations up to quite laconical ones. The disproportion of the amount of data of particular categories and the lack of some of them for certain territories is also apparent.

Finally — the data presented below — are derived from the historical sources and elaborations, ethnographical field-research and the botanical studies — already published — as well from the similar ethnographical and historical investigations undertaken by the author in 1960 in North-Eastern India and Central Nepal — as-yet unpublished.

As mentioned above, the cultivation of some peculiar and „primitive“ types of maize (waxy corn, pop corn etc.) in Asia is mostly confined to the mountain areas and is testified up till now for some regions of Transcaucasia, Azerbaidjan, Armenia, North-Eastern Persia, Western and Eastern Turkestan, Eastern Siberia, Manchuria, Western and Southern China, South-Eastern Tibet, Kashmir, Nepal, Sikkim, Bhutan, Assam, Burma, Vietnam, Philippines, while similar varieties are to be found probably in Thailand, Laos, and may be also in Taiwan, Hainan, some islands of Indonesia and New Guinea².

As one of the most important or even a staple crop, maize is cultivated among the natives of West-Central (Rapti Valley³,

¹ Comp. Heine-Geldern, *ib.*, p. 393.

² Kuleshow, *Some Peculiarities...*, pp. 370—373; Stonor—Anderson, *Maize among...*, p. 393; Weatherwax, *Indian Corn...*, p. 373.

³ Perceval Landon, *Nepal*, London 1928, II, p. 6.

Butwal¹, Baglung², Palpa³, Katmandu Valley⁴) and Eastern Nepal (Myong and Tambur Valleys⁵, Ilam⁶), Lepcha in Sikkim⁷, Bhutani in Bhutan⁸, Monpa, Aka⁹, Dafla¹⁰, Ramo, Bokar, Pailibo¹¹, in Northern Assam; some Northern Khasi¹² in Central Assam; Tangsa¹³, Chang, Sangtam, Kalyo Kengyu¹⁴, Angami¹⁵, Sema¹⁶, and Eastern Rengma¹⁷ in North-Eastern Assam; Hmar¹⁸, Paite¹⁹, Fanai²⁰, Chin²¹ on the Assam-Burma border; La and

¹ Landon, *ib.*, p. 10.

² Landon, *ib.*, p. 17.

³ Francis Hamilton, *An Account of the Kingdom of Nepal...*, Edinburgh 1819, p. 178.

⁴ Hamilton, *ib.*, p. 74.

⁵ J. D. Hooker, *Himalayan Journals...* London 1854, I, pp. 181, 182, 191.

⁶ Personal communication of Khanandasharma (Nepali) — Kalimpong (Darjeeling Distr.) 10. XI. 1960.

⁷ John Morris, *Living with Lephas*, London—Toronto, 1938, pp. 177, 184.

⁸ R. B. Pemberton (Capt.), *Report on Bootan*, 1838 in: *Political Missions to Bootan*, Calcutta 1865 p. 66; Stonor—Anderson, *Maize among...*, p. 372.

⁹ Stonor—Anderson, *ib.*, p. 370.

¹⁰ Stonor—Anderson, *ib.*, p. 368; B. K. Shukla, *The Daflas of the Subansiri Region*, Shillong, 1959, p. 50.

¹¹ Sachin Roy, *Aspects of Padam-Minyong Culture*, Shillong, 1960, p. 134.

¹² Per. com. Jiibon Roy (Shynteng) — Jowai (Jayntia Hills) 6. V. 1960.

¹³ Parul Dutta, *The Tangsas of the Namchik and Tirap Valleys*, Shillong, 1959, p. 24.

¹⁴ Stonor—Anderson, *ib.*, pp. 362, 363.

¹⁵ J. H. Hutton, *The Angami Nagas...*, London 1921, p. 77.

¹⁶ J. P. Mills, *The Lhota Nagas*, London 1922, p. 56.

¹⁷ J. P. Mills, *The Rengma Nagas*, London 1937, p. 86.

¹⁸ Per. com. Thila, Van Lalthanga, Rang Za Khuma (Hmar) — Lakhipur (Cachar Distr.) 21. VIII. 1960.

¹⁹ Per. com. Sanghiana (Tochhawng) — Head Master of High School Aijal (Lushai Hills) 12. V. 1960.

²⁰ J. Shakespear (Lt.-Col.), *The Lushai Kuki Clans*, London 1912, p. 139. Per. com. Rev. Thankunga (Khangte) — pastor (ca 80 years) Aijal 13. V. 1960.

²¹ N. E. Parry, *The Lakhers*, London 1932, p. 4; Stonor—Anderson, *Maize among...*, pp. 364—365.

Wa¹ in Kengtung area; Lahu² in Shan States and Southern Yü-Nan; Musur³ in Thailand; Lisu⁴ in Western Yü-Nan; Nutsi⁵ in North-Western Yü-Nan; Moso⁶ in North-Western Szechwan and Eastern Tibet; Lolo⁷ in Southern Szechwan, North-Eastern Yü-Nan and North-Western Kweichow; Yao⁸ in Western Kwangsi and Northern Laos; Meo⁹ in Laos and Tonkin; Li¹⁰ in Hainan and some tribes of Philippines (Cebu)¹¹ and Indonesia (Celebes, Flores)¹².

As a subsidiary crop, maize is cultivated among: the natives of Yarkand, Kashgar, Turfan, Kucha¹³, Northern Kashmir¹⁴; Southern Khampa¹⁵ in South-Eastern Tibet; Miri¹⁶, Apa Tani, Mishmi¹⁷, Padam, Minyong¹⁸, Khampiti¹⁹ in Northern As-

¹ J. George Scott, *Gazetteer of Upper Burma and the Shan States*, Part I, Vol. I, Rangoon 1900, p. 509.

² Scott, *ib.*, pp. 276, 588.

³ James (Mc) Carthy, *Surveying and Exploring in Siam*, London 1900, p. 142. Comp. Stonor—Anderson, *Maize among...*, p. 389.

⁴ Alexander Slawik, *Ostasien, Die grosse Völkerkunde*, Bd. II: Asien, Leipzig 1939, p. 119.

⁵ Slawik, *ib.*, p. 117.

⁶ Slawik, *ib.*, p. 116.

⁷ Scott, *Gazetteer...*, p. 613; Slawik, *Ostasien*, p. 118.

⁸ Scott, *Gazetteer...*, pp. 602, 603; W. Eberhard, *Kultur und Siedlung der Randvölker Chinas*, Leiden, 1942, p. 200.

⁹ Scott, *ib.*, p. 601; Stonor—Anderson, *Maize among...*, p. 389; Henri Roux (avec la collaboration de Tran-Van-Chu), *Quelques monorités ethniques du Nord-Indochine*, France-Asie, Nos 92—93, 1954, pp. 391, 393, 406.

¹⁰ Stonor—Anderson, *Maize among...*, p. 389.

¹¹ Dean C. Worcester, *The Philippine Islands and their People*, London 1898, p. 507.

¹² Hatt, *The Corn Mother...*, pp. 883—888.

¹³ H. W. Billew (Surg.-Mjr), *Kashmir and Kashgar...*, London 1875, pp. 4/5.

¹⁴ J. F. Royle, *Essay on the Productive...*, p. 442.

¹⁵ Per. com. Sonam Tshring Dzikumbe (native from Amdo) — Algorah (Darjeeling Distr.) 10. XI. 1960; comp. C. H. Desgodins, *Le Tibet d'après la correspondance des missionnaires*, Paris 1885, p. 396.

¹⁶ Per. com. Prof. M. C. Goswami — Gauhati 19. III. 1960.

¹⁷ Stonor—Anderson, *ib.*, p. 372.

¹⁸ Roy, *Aspects of...*, p. 134.

¹⁹ Per. com. R. K. Mukerj — Shillong 24. III. 1960.

sam; Ao¹, Lhota², Kacha³, Western Rengma⁴ in Eastern Assam; Mikir⁵ and Jayntia⁶ in Central Assam; Garo⁷ in Western Assam; Chakma⁸ in Tripura; Thadou⁹ in Southern Manipur; Lushai¹⁰ and Lakher¹¹ in South Eastern Assam; Kachin¹² in Upper Burma; Red Karen¹³ on the Burma-Thailand border; Bre¹⁴ in Southern Shan States; Akha¹⁵, P'u-Noi¹⁶ and Tsa Khmu¹⁷ in Northern Laos; Igorottes¹⁸ in South-Eastern Luzon and some Papua tribes¹⁹ in Eastern New Guinea.

It is to be emphasized that: Kachari²⁰ and Konyak²¹ from Eastern Assam; Tangkhul²² and Meithei²³ from Manipur and Tai

¹ J. P. Mills, *The Ao Nagas*, London 1926, p. 125.

² Mills, *The Lhota...*, pp. 56/57.

³ Stonor — Anderson, *ib.*, p. 362.

⁴ Mills, *The Rengma...*, p. 77.

⁵ Stonor — Anderson, *ib.* p. 367.

⁶ Author's investigation in Jowai 6. V. 1960.

⁷ A. Playfair, (Mjr), *The Garos*, London 1909, p. 50.

⁸ Author's investigation in Manu area (Central Tripura) 12—13. VII. 1960.

⁹ William Shaw, *Notes on the Thadou Kukis*, 1929, p. 87.

¹⁰ Author's investigation in Lushai Hills in V, VII, and VIII 1960.

¹¹ Parry, *The Lakheres*, p. 79.

¹² Scott, *Gazetteer...*, p. 424.

¹³ Scott, *ib.*, p. 528; Carthy, *Surveying...*, p. 6; Humlum, *Zur Geographie*, pp. 30/31.

¹⁴ Scott, *ib.* pp. 532, 535.

¹⁵ Roux, *Quelques...*, p. 195.

¹⁶ Roux, *ib.*, p. 257.

¹⁷ Roux, *ib.*, p. 351.

¹⁸ F. Jagor, *Travels in the Philippines*, London 1875, p. 209.

¹⁹ Stonor — Anderson, *ib.* p. 389; Pierre-Dominique Gaisseau, *Visa pour la préhistoire, Shangrila, La vallée perdue de Nouvelle Guinée* (Polish ed.: *Wiza do kraju prehistorii...*, Warszawa 1959, p. 58).

²⁰ Sidney Endle (Rev.), *The Kacharis*, London 1911, p. 14.

²¹ Christoph Fürer Haimendorf, *The Naked Nagas*, Calcutta 1946, pp. 48, 120, 130.

²² T. C. Hodson, *The Naga Tribes of Manipur*, London 1911, pp. 149/150.

²³ T. C. Hodson, *The Meithei*, London 1908, p. 110.

from Burma¹, Thailand², Laos³ and Tonkin⁴ prefer paddy cultivation and very seldom and scarcely cultivate maize.

The economical value of maize among the mountain peoples of South-Eastern Asia and adjacent islands, is also reflected in the role which it plays in some of their festivals and funeral ceremonies.

Lepcha⁵ in the first week of December offer the new grains of millet, aus-paddy and maize to their supreme deity Sakyarum, as well to the souls of dead. Bhutani⁶ offer maize on the house altars — to the Lord Budda in July and Auguste, to the deceased in September. Monpa the first ears of maize hung up as offerings to the Lord Budda in the village-temples and small wayside shrines, „while — as pointed out by Stonor⁷ — they deny any such practice in the case of their barley which (together with their Buddhism) they must have obtained from Tibet“. Chang⁸ believes that each of their major crops, maize among others, has its own tutelary deity. Rengma holds several festivals called *genna*, among which „August-genna“ — as indicated by Mills⁹ — „marks the beginning of the maize and millet harvest“. Garo in their agricultural festivals offer chiefly the rice¹⁰; but to their supreme deity Rabuga-Ranaga they offer among other crops also the maize¹¹. Khasi, according to Gurdon¹², tie with a string nine fried grains of maize around the head of deceased during their funeral rites.

¹ Archibald Ross Colquhoun, *Amongst the Shans*, London 1885, p. 410.

² Stonor — Anderson, *Maize among...*, p. 389.

³ H. Warington Smyth, *Five Years in Siam from 1891 to 1896*, London 1898, I, p. 171.

⁴ Roux, *Quelques minorités...*, pp. 376, 377.

⁵ Per. com. Sankri Lepcha (ca 70 years) — Nasseygaon (Darjeeling Distr.) and Tamsang — Kalimpong; 9—11. XI. 1960.

⁶ Per. com. Czönubu, Pem Gachou and Ongdi Bhutia — Paiyung (near Kalimpong) 10. XI. 1960.

⁷ Stonor — Anderson, *ib.*, p. 371.

⁸ Stonor — Anderson, *ib.*, p. 362.

⁹ Mills, *The Rengma...*, p. 88.

¹⁰ B. N. Choudhury, *Some Cultural and Linguistic Aspects of the Garo, Gauhati*, 1958, pp. 24—28.

¹¹ Per. com. Dhawaran Koknal Marak (ca 86 years) — Tura (Garo Hills) 2. IV. 1960.

¹² P. R. T. Gurdon (Lt), *The Khasis* (Sec. Ed.) 1914, p. 132.

Nevertheless it seems likely that this reference concerns only one of the northern subdivision of this people, as for instance among the War, one of the southern subdivision, maize does not play any role in their religious ceremonies¹. Jayntia, in some villages still offer maize along with other crops and fruits to the goddess of agriculture Pyrthat² and during the funeral rite called *siang* — to the souls of the dead³. Tripuri, Chakma and Mok⁴ offer cooked maize and rice to the Lord Buddha or ghosts and to the souls of the dead. Hmar⁵, for the end of harvest in December offer to their supreme god Pathienbie, the bread prepared from the maize flower, while during the great festival *thlasiem* held in January — all crops and vegetables to the souls of the dead. Lushai⁶ during the festival *mimkut*, held when maize and millet were ripe then in the end of August or early September, offer the new crops to their dead. It must be added that this festival, named after the maize⁷, according to some Lushai's historical tradition started in Burma around the year 1746⁸. Similar offerings were also made to their chief deity Pathian⁹. Lakher¹⁰ from the Chapi village performed the dance called *pazutawla* to celebrate the harvest of maize. This tribe was also known as giving offerings to the spirits of paddy and maize to prevent them from leaving the village. Red Karen¹¹ near the graves of their

¹ Author's investigation in Cherrapunjee area (Khasia Hills) 5. V. 1960.

² Per. com. Jata Shilla (ca 90 years), Shaimon Challam (ca 60 years) — Jowai (Jayntia Hills) 6. V. 1960.

³ Per. com. Prof. M. C. Goswami — Gauhati 19. III. 1960.

⁴ Author's investigation in Manu and Mainoma (Central Tripura) 12—13. VII. 1960.

⁵ Per. com. Thila (over 80 years), precedent priest „thiempu“ of Hmar — Lakhipur (Cachar Distr.) 21. VIII. 1960.

⁶ N. E. Parry, *A Monograph on Lushai Customs & Ceremonies*, 1928, p. 91; Author's investigation in Aijal in V and VII 1960.

⁷ Shakespear, *The Lushai...*, p. 87.

⁸ R. Buchhawna, *Mizo Hla* (Select Lushai Songs), 1930, Pre-face p. 2.

⁹ Author's investigation in Lungdai (near Aijal) 12. V. 1960.

¹⁰ Parry, *The Lakher*s, pp. 78, 434, 445.

¹¹ Scott, *Gazetteer...*, p. 528; Albert Fytche (Lt.-Gen.), *Burma, Past and Present*, London 1879, I, p. 338.

dead used to place as offerings the cobs of maize together with other cereals. Toradja have special performances, including offerings, connected with the so called Rice Mother and Maize Mother — guardian spirits of these crops. „The maize rites of the Toradjas — suggested Hatt¹ — may perhaps have arisen in connection with or as a sort of imitation of the rice rites“

It seems to be somewhat singular that among some peoples, to whom maize plays an important role in their economical life, in their religious and funeral ceremonies only rice plays a distinguished role. Such is the state reported for instance among the Dafla², Tangsa³, Rengma⁴, Angami⁵, Kachin⁶ and some Meo⁷ from Laos.

Nevertheless we may doubt whether the investigations among all these tribes were done sufficiently, and then, whether our informations in this matter are complete.

The above presented distribution and extension of maize cultivation among the mountain peoples of South-Eastern Asia, depends on different factors. Concerning Assam Stonor remarks⁸ that „In general it is of more importance to the tribes living at high altitudes, a state of affairs not unconnected with absence of rice varieties suitable for cold elevations, as among Chang Nagas and surrounding tribes and possibly among the eastern branch of the Lushais and the Chins“. Among the Monpa as he emphasizes further, the reason is the scarcity of arable lands fit for irrigation. Maybe for the similar economical reasons maize is preferred to rice among some Lolo, Yao and Meo tribes. On the other hand, the lack or scarcity of maize cultivation may be caused sometimes by very specific reasons as is the case with Konyak about which Stonor⁹ was informed „that

¹ Hatt, *The Corn...*, p. 883.

² Shukla, *The Daflas*, p. 119.

³ Dutta, *The Tangsas*, pp. 29, 70, 82.

⁴ Mills, *The Rengma...*, pp. 83, 218, 235, 311—314.

⁵ Hutton, *The Angami...*, p. 203, 228, 348.

⁶ P. Ch. Gilhodes (Rev.), *La religion des Katchins (Birmanie)*, „Anthropos“ IV, 1909, pp. 707, 718, 722.

⁷ Smyth, *Five Years in Siam...*, I, p. 175.

⁸ Stonor — Anderson, *Maize among...*, pp. 375, 377.

⁹ Stonor — Anderson, *ib.*, p. 362.

the people were not keen on it as it attracted bears to the fields“.

The varieties of maize grown in particular areas, as emphasized by Stonor¹ „are clearly dependent, within the limits of the climate, on the culture contacts“. „There is far greater — he writes — variety of types grown along the Assam-Burma border (Nagas, Lushais and Chins) than in the outer Himalayas (Abors, Daflas, Monbas), although maize is on the whole more important in the Himalayan region“ and further: „...the people of this region seem to cultivate only the larger coarser types, the small several-eared forms being entirely absent and apparently confined to the Assam-Burma border. These very distinctive small varieties are moreover grown at low altitudes, and I do not think them to be cultivated at elevations higher than 4000 feet“. Nevertheless it must be mentioned here that among 19 varieties cultivated by Lepcha² in Sikkim two of them: *namdit* and *sundur*; in Ilam³ — *murali* and in Bhutan⁴ — *dasum* — are of very small size. It should be also considered that the preference for such or another type of maize depends on the conditions in which particular tribes live. Then for instance the larger forms are suitable for storing, some smaller — for eating fresh, another small — for popping⁵. The diffusion of the particular maize varieties is very well reflected in some of their local names which point to the tribe or the place from which they have been brought.

Among the Khasi the generally current name for maize *riew hadem* means most probably, as already pointed out by Stonor⁶, „Grain of the Hadem people“, which suggests that this crop was received by Khasi from the Hadem⁷ — a little tribe

¹ Stonor — Anderson, ib., p. 375.

² Per. com. Tamsang (Lepcha) and others) — Kalimpong 11. XI. 1960; comp. Laufer *The Introduction...*, p. 242.

³ Per. com. Khanandasherma (Nepali) — Kalimpong 10. XI. 1960.

⁴ Per. com. Czonubu, Pem Gachou, Ongdi Bhutia (Bhutani) — Paiyung (near Kalimpong) 10. XI. 1960.

⁵ Stonor — Anderson, ib., pp. 377, 379.

⁶ Stonor — Anderson, *Maize among...*, p. 367.

⁷ Per. com.: Prof. M. C. Goswami — Gauhati 19. III. 1960; Firmly Bert Lyngdoh (Shynteng) — Tura 2. IV. 1960.

akin to Hmar, living in Jayntia Hills. Similarly the term used by the Mok for one variety i. e. *langi makka fu* means „Langi maize“, while Langi designates the Kuki tribes¹. Further the Thadou has the name *kolbu*, which, as emphasized by Stonor² means „Burma food“. Among the Lushai there are several names designating the particular varieties, which indicate from which neighbouring tribe they have been received. Then, besides the *ralte vaimim* (Ralte one tribe of Lushai) considered as indigenous³ we have: *poi vaimim*⁴ (Poi — tribe in Chin Hills); *halka*⁵ (Halka — tribe akin to Poi); *lenliam*⁶ (Lenliam — village of Poi near Champhai); *tlanglau vaimim*⁷ (Tlanglau — tribe of Kuki in SW Lushai Hills); *miria vaimim*⁸ (Miria tribe akin to Lushai, near Chit-tagong); *lakher vaimim*⁹ (Lakher — tribe in S. Lushai Hills); *bawngpu vaimim* which means „Herdsmen's maize“ (after the name given in Lushai Hills to the Nepali immigrants)¹⁰ and *vai-vaimim* (vai — „foreign thing“) ¹¹ considered to be obtained from outside Lushai Hills (Cachar plains or elsewhere)¹². We find a term similar to this last term among Sema who generally call maize *kola-kithi* which is supposed to mean „foreigner's Job's tears“¹³. Further, Ao from Chantogra village use the name *moya zungkhua* which means „Sema lentils“¹⁴, while Lhota call one of varieties *aorr-chemyang* which means „Ao Naga blood“ and another *ko-*

¹ Per. com. Yong Hla (Mok) — Mainoma (Centr. Tripura) 13. VII. 1960.

² Stonor — Anderson, ib., p. 367.

³ Stonor — Anderson, ib., p. 364.

⁴ Stonor — Anderson, ib., p. 364.

⁵ Per. com. Zangena (Poi) — Aijal 9. VIII. 1960.

⁶ Per. com. Pi Chhumi (Poonte) — Aijal 2. VIII. 1960.

⁷ Idem.

⁸ Per. com. Lalmawii Hranglura (Sailo) — Aijal 21. VII. 1960.

⁹ Per. com. Dophunga (Chongthu) — Aijal 14. V. 1960.

¹⁰ Stonor — Anderson, ib., p. 364.

¹¹ J. Herbert Lorrain — Fred. W. Savidge, *A Grammar and Dictionary of the Lushai Language (Dulien Dialect)*, Shillong 1898.

¹² Author's investigation in Lushai Hills in V, VII and VIII 1960.

¹³ Hutton, *The Sema...*, pp. 60; 399.

¹⁴ Mills, *The Ao...*, p. 125.

noma-tsunghundro, which means „Konoma-maize“ (after a large Angami village)¹.

Summarizing, it can be said — even considering this little set of examples from the Central and Eastern Assam — that the western and northern directions of the diffusion of maize varieties, seem to be prevalent in that area.

Among several tribes we can find also current ideas about the approximate time of introduction of particular varieties — and some of them are regarded as their own, cultivated by their forefathers, others as later acquisitions obtained from neighbours, still others as more or less recently brought by Nepali immigrants or by Europeans.

Lepcha from the Darjeeling area² consider as the oldest *namdit* variety, *palliob* as brought later; Garo from the Tura area³: *sarang* variety as the oldest, *badol* as later introduced; Lhota⁴: the *tchetum-sopfu* and *moro* varieties as indigenous, *konoma-tsunghundro*, as fairly recent acquisition; Lushai⁵: *ralte vaimim* and *mimpui* as ancient varieties brought by them from Burma, *puakzo*, *vai vaimim* etc., as received after their settlement in Eastern Assam. Among the Lushai — for two other varieties, are even given quite exact dates of their introduction: *buali* is supposed to have been brought in the year 1921 from Lungleh (S. Lushai Hills) to Jampui Range (W. Lushai Hills) — by a woman named Buali⁶; *miria vaimim* — between the years 1930 and 1932 — from Mualvum village (Chittagong area) to central part of Lushai Hills, — by some aboriginal Christian missionaries⁷.

The comparative ethymological study of the local names of the particular varieties of maize can also throw some light on their diffusion. Therefore we can distinguish several groups of them inside of which the names show such degree of similarity that

¹ Stonor — Anderson, ib., p. 360.

² Per. com. Sankri Lepcha — Nasseysgaon (Darjeeling Distr.) 9. XI. 1960.

³ Per. com. S. P. Marak — Tura (Garo Hills) 2. IV. 1960.

⁴ Stonor — Anderson, *Maize among...*, pp. 359, 360.

⁵ Author's investigation in Lushai Hills in V, VII and VIII 1960.

⁶ Per. com. Lianhmingthanga (Ralte) — Lakhipur 16. VIII. 1960.

⁷ Per. com. Lalmawii Hranglura (Sailo) — Aijal 21. VII. 1960.

their common origin seems to be very probable. Where the tribes, among which similar names occur, are neighbouring or are not very distant, the explanation is quite obvious, but where they are separated by the vast territories it makes the interpretation more complicated. The first case is very well represented by the two following groups of names: I. *tongi* (Konyak), *hang* (Chang), *hengchi-merem* (Sangtam), *achang-tangba* (Ao), *lingtak-tungne* (Kacha)¹, *thengthe* (Mikir)²; II. *sebu* (Bhutani)³, *tsibie* (Aka)⁴ *topothe* (Dafla)⁵, *tepä* (Galong)⁶, *sapa* (Padam, Minyong)⁷, *tiipe*⁸, *sepa*, *tepaang*⁹ (Hill Miri) and eventually *santapfo* (NW Rengma)¹⁰ and *tchetum-sopfu* (Lhota)¹¹.

The second case may be exemplified as follows: I. *akhoi* (Aka)¹², *akhona* (Sangtam)¹³, *akhuzi* (E. Rengma)¹⁴ and eventually *merakhu* (Chisak — tribe of Garo)¹⁵; II. *kup* (Lepcha)¹⁶, *mikop* (Abeng — tribe of Garo)¹⁷; III. *nam-dit* (Lepcha)¹⁸, *nam-pium* (P'u Noi)¹⁹; IV. *brasmos-sel* (Central Tibetan)²⁰, *syal* (Khaling — tribe of Kiranti)²¹, *saly* (Tsa Khmu)²²; V. *mulung-bap*

¹ Stonor — Anderson, ib., pp. 361, 362.

² Stonor — Anderson, ib., p. 367.

³ Author's investigation in Payiung (near Kalimpong) 10. XI. 1960.

⁴ J. D. Anderson, *A short Vocabulary of the Aka Language*, Shillong 1896.

⁵ Stonor — Anderson, ib., p. 370.

⁶ Per. com. B. D. Shastri — Shillong 2. V. 1960.

⁷ Roy, *Aspects of...*, p. 285.

⁸ Per. com. B. D. Shastri — Shillong 2. V. 1960.

⁹ J. Herbert Lorrain, *A Dictionary of the Abor-Miri Language...*, Shillong 1910, p. 322.

¹⁰ Mills, *The Rengma...*, p. 379.

¹¹ Stonor — Anderson, *Maize among...*, p. 359.

¹² Per. com. Padmeswar Gogoi — Gauhati 7. IV. 1960.

¹³ NEFA-Dictionary of Sentences: Sangtam, Shillong 1951, T. 94.

¹⁴ Mills, ib., p. 370.

¹⁵ Per. com. Fr. G. Costa — Shillong 7. IV. 1960.

¹⁶ Per. com. Tamsang — Kalimpong 11. XI. 1960.

¹⁷ As 16.

¹⁸ As 16 and Sankri Lepcha — Nasseysgaon 9. XI. 1960.

¹⁹ Roux, *Quelques minorités...*, p. 289.

²⁰ H. A. Jäschke, *A Tibetan-English Dictionary...*, London 1881, p. 400.

²¹ B. H. Hodgson, *On Himalayan Ethnology*, Darjeeling 1857, p. 199.

²² Roux, ib., p. 351.

(Sangpang — tribe of Kiranti)¹, *bapsusa* (Nachhereng — tribe of Kiranti)², *báp* (Viet³; maybe borrowed from the aboriginal tribes); — VI. *ngawng* (Kachin)⁴, *ngo* (Viet)⁵.

A supplementary investigation of the names of particular elements of maize and stages of its growth may be also fruitful. A good example of a fairly developed nomenclature we find for instance among the Lepcha where⁶: maize is called: *kun-chung*; its young head when first appearing: *ban-kup-sal*; young tender head: *duk*; when seeds commence to appear: *abok*; when the grains begin to get a little larger: *ta-zi-muk*; when the grains begin to get a little firm: *pa-thyu-mik*; when the grains have acquired firmness: *tung-bol-hop-mik*; when ripe: *ral ryu*; after ripening: *pak*; young shoot from stem: *kip*; a cob with differently colored grains: *mik-tak*; grain: *mik*; grain separated from the cob: *hyu*; flower: *salo*; husk: *pi*; skin around the grain: *fop*; beard of maize: *syum*.

The comparative study of the historical traditions, myths and legends concerning the beginning of maize and other crop cultivation has also a certain value for the discussed problem.

After one Tibetan legend⁷ in the remotest times Lord Avalokiteśvara gave the seeds of maize to the progenitor of the monkeys and ordered him to cultivate it in the place called Sothang (Tsethang), situated in the present Cetan area (SE from Lhasa). Monkeys while feeding on this crop lost their hair and tails, and changed into human beings. Later on the cultivation of maize in that region disappeared.

In the Lepcha mythology⁸ it is said that all seeds of the crops cultivated by them originate from a country Nye-mayel-lyang

¹ Hodgson, ib., p. 180.

² As ¹.

³ *Đào-Đặng-vý, Việt-Pháp Tân-Từ-Điển, Nouveau Dictionnaire Vietnamien-Français*, Saigon 1956, p. 814.

⁴ H. F. Hertz, *A practical Handbook of the Kachin or Chingpaw language*, Rangoon 1902, pp. 48, 94.

⁵ As ³. ⁶ As ¹⁶ on the p. 273.

⁷ Per. com. G. Rigzin Vang Po — Kalimpong 11. XI. 1960. According to the information of this lama the above mentioned legend is narrated in: *Gyal Rap Sal Wai Me Long*, a Tibetan historical book.

⁸ Per. com. Tamsang — Kalimpong 11. XI. 1960: after the version related him by two farmers: Jamu Lepcha (78 years) and Tashi Ongmu Lepcha (83 years).

(The holy country of the eternal purity) which is supposed to be somewhere in the Himalaya. Lepcha tradition says¹ that in the previous times maize was their staple crop and aus-paddy — only scarcely cultivated.

Monpa tradition admits, as pointed out by Stonor² „that they have always grown maize“ as their staple cereal. The Dafla³ say also the same although maize does not play for them such an important role. After other traditions⁴ both tribes obtained this plant from Tibet.

Aka according to Stonor's⁵ informants came to the hills from the Brahmaputra Valley many generations ago and at that time their main or only crop was paddy, while they learnt to grow maize from Monpa.

Adi (Abor) has a myth after which all their main crops including maize they got „on the horns of the tame Bison“⁶.

Among the Chang „...rice is widely recognized — remarks Stonor⁷ — as being a more recent crop than the other cereals, maize not excluded“.

Ao, Sangtam, Sema, Lhota and Angami⁸ state that maize was their ancient crop or even cultivated from the immemorial times. Kacha „have a tradition — writes Stonor⁹ — that the tribe first emerged from a cave in their area, and brought their old established crops with them, maize being among them“.

Western Tai have numerous versions of their semi-fabulous, semi-historical tradition about two „heavenly“ kings Hkun-lung and Khun-lai. After one of them — to be found in a historical book written in Phakial language and script¹⁰, and entitled: *Lik Kho*

¹ As ⁷ on the p. 274.

² Stonor — Anderson, *Maize among...*, p. 371.

³ Stonor — Anderson, ib., p. 370.

⁴ Per. com. Shron Singh (Agriculture Officer NEFA) — Shillong 24. III. 1960.

⁵ Stonor — Anderson, ib., p. 370.

⁶ Stonor — Anderson, ib., pp. 369/370.

⁷ Stonor — Anderson, ib., p. 362.

⁸ Stonor — Anderson, ib., pp. 359—361, 363.

⁹ Stonor — Anderson, ib., p. 363.

¹⁰ Preserved in a manuscript belonging to Chaijhong Gohain (Phake) (from Gauhati), which has been copied from the original (now lost)

Khon Tai Phwa („A Book relating to the kings of Tai“)¹, Jasinghpha, goddess of learning gave the following order to these sovereigns: „Be kings (in) another country and do not be proud and not think yourself be great (so that) others may obey as kings. Cultivate lands, sow seeds of pulses, sesamum seeds, mustard and maize also. Reserve and do not throw them away“.²

Hkun-lung and Khun-lai, as historical persons the kings of Mao Shans and progenitors of the Ahom dynasty, are supposed to have ruled in Yü-Nan in the VIth century A. D. i.e. at the time when the great migration of Tai peoples to Burma has begun³. The Phakial (Phake) — tribe akin to Ahom, Khampti and other Tai tribes of North-Eastern Assam — are said to have arrived here from Upper Burma ca 1760, immediately after the subjugation of the kingdom of Pong (present Mogaung area) by Alomphra, the king of Burmese⁴, and settled in the Lakhimpur area.

We do not know the date of the original of the Phakial manuscript. Its copy was prepared about 80 years ago. Without denying a certain value of the above quoted mention, it seems very probable, that the word for maize (*khau-phwa* „paddy of the sky“)⁵ written in this copy between the lines, could have

by his father Noikham Gohain (from Naharkatiya in Lakhimpur Distr.).

¹ In a free translation of Prof. P. C. Choudhury (Head of the Department of Historical & Antiquarian Studies Gauhati University) 22. IV. 1960.

² Phakial text after transliteration: *Yām phūn thun phu nā pūk khāu lāk hāu lūk chāo sow kun mūng hāi klāng pūk lāi ān phān thu phān ngā kup khāu yā hāu ben.*

Translated into English by Chaikhong Gohain and B. Barua (Ahom Scholars from the Dept. of Hist. & Antiqu. Stud. Gauhati University) — 22. IV. 1960.

³ Padmeswar Gogoi, *The political expansion of the Mao Shans*, „The Journal of the Siam Society“, Vol. XLIV, pt. 2 August 1956.

⁴ G. A. Grierson, *Mon-Khmer and Siamese-Chinese Families* (including Khassi and Tai), „Linguistic Survey of India“, Vol. III, Calcutta 1904, pp. 63, 64, 213.

⁵ Comp. J. F. Needham, *Outline of the... (Khāmṭi) language as spoken by the Khāmṭis residing in the neighbourhood of Sadiya*, Rangoon 1894, p. 159.

been interpolated later into the original or added by the copist (see: Table). In any case no other version of the Tai historical tradition including a similar mention about the cereals is known to the author¹. Khasi² and Jayntia³ consider maize as one of their ancient crops. However among the War — southernmost tribe of Khasi, one meets⁴ the opinion that paddy cultivation preceded that of maize. Garo, as reported by Stonor⁵ „say they have always grown maize, and got it with their main crops 'out of the ground'“. The tradition⁶ current among certain Garo tribes ascribes the introduction of crops — including maize, paddy and millet — to the Abong Noga (Muga Dingsepha) considered the first chief of the tribe Matchi⁷ or — more generally — one of the ancient rulers of all Garo⁸. Tripuri, Chakma and Mok⁹ usually regard maize and paddy as equally ancient crops. It may be added here that after one tradition about the great flood, current, as pointed out by Hutchinson¹⁰ among the aborigines of the Chittagong Hill Tracts, the saved human couple discovered in the crop of a pigeon killed by them, maize and paddy grains which they sowed and subsequently multiplied both cereals.

Lushai and Hmar have very well preserved their historical traditions. The most common versions have even been published

¹ For instance in: Ahom Buranji (with parallel English translation) from the earliest time to the end of Ahom rule. Translated and Edited by Rai Sahib Golap Chandra Barua, Calcutta 1930 (see: Ch. II; 14—18); as well in a five manuscripts in Ahom language studied by B. Barua on the author's request (per. com. 27. IV. 1960).

² Stonor — Anderson, *Maize among...*, p. 367.

³ Author's investigation in Jowai (Jayntia Hills) 7. V. 1960.

⁴ Author's investigation in Lower Cherra and Nongthymmai (Cherrapunjee area — Khasia Hills) 5. V. 1960.

⁵ Stonor — Anderson, *ib.*, p. 368.

⁶ Per. com.: D. K. Marak — Tura (Garo Hills) 2. IV. 1960 and Fr. G. Costa — Shillong 7. V. 1960.

⁷ Per. com. Prof. M. C. Goswami — Gauhati 8. V. 1960.

⁸ D. Marak Jobang, *The Garo History*, Part I Achik Kata Bak I, Tura 1930, p. 22.

⁹ Author's investigation in Manu and Mainoma (Central Tripura) 12—13. VII. 1960.

¹⁰ R. H. Sneyd Hutchinson, *An Account of the Chittagong Hill Tracts*, Calcutta 1900, pp. 179, 180.

in their languages by some educated tribals. The forefathers of these tribes along with the progenitors of the majority of other peoples are said to have emerged from a cave in the place called Chhin-lung¹ (or Sin-lung)² which is supposed to be somewhere on the Upper Burma-China border, as there are up till now several localities bearing similar names, e. g. Chinglung³, or Silung and Tsiling⁴. From there, these tribes had wandered to the Shan States⁵ then to the plain of Burma⁶ and after crossing Irrawady and Chindwin rivers, to settle in the Chin Hills and then in Eastern Assam. According to Siama⁷ the migration of Lushai from the Shan States has started before 1400 A. D. and reached Lushai Hills ca 1700 A. D.

As concerning the crops supposed to have been known to them before they had left Upper Burma, there is much confusion. Some natives have vague ideas that already in that area they cultivated paddy, maize and millet⁸, but the opinion that maize cultivation antedates that of paddy and that it was known to them before or after they came to the Chin Hills⁹ is prevalent. According to Liangkhaia¹⁰ and Siama, when the Lushai were living still between Run and Tiau rivers, they were quite backward in the crop cultivation,

¹ J. Herbert Lorrain (Pu Buanga), *Dictionary of the Lushai Language*, Calcutta 1940, p. 80; comp. Vanchhunga, *Lusei leh a vela hnam dange chanchin*. Aijal 1955, pp. 3, 112. In some Chinese and Burmese traditions quoted here — Ching-lung is the name of the king ruling once Lushai and other akin tribes somewhere in Burma (after the transl. of Sangliana (Headmaster of the High School in Aijal) 12. VIII. 1960.

² Hranglien Songate, *Hmar History (Hmar Chanchin)*, Imphal 1958, p. 6.

³ Per. com. Pasena (Chongthu) — Aijal 21. VII. 1960.

⁴ Songate, ib., p. 6.

⁵ Songate, ib., p. 6.

⁶ Per. com. K. H. Bawichhuaka (Hmar) — Aijal 19. VII. 1960.

⁷ V. L. Siama, *Mizo Chanchin*, Aijal 1953, pp. 7—8, 22.

⁸ Per. com. Pasena (Chongthu) — Aijal 21. VII. 1960; Thila (Hmar) Lakhipur 21. VIII. 1960.

⁹ Author's investigation in Kolasib, Lungdai and Melthum (Aijal subdivision), 12—14. V. 1960; in Aijal and Lakhipur in VIII. 1960.

¹⁰ Rev. Liangkhaia Ziak, *Mizo Chanchin*, Bu I (Revised Sec. Ed.), Calcutta 1948, p. 25 (Transl. Sangliana 13. V. 1960); comp. Siama, ib., pp. 9, 10, 17.

and first they grew maize, millet and yam, while with paddy they became acquainted after they came up to the Lentlang range (E. Lushai Hills). After another version¹ the acquisition of this new crop took place near the river Tuihrian. Finally Call² reports „... the old Lushai believe that the rice of gods used to lie in the Rih lake of Burma and the plains of Champhai...“ — then also on the Assam-Burma border. Kauri (subtribe of Lafai — tribe of Kachin), as reported Gilhodes³, has a myth⁴ about the origin of paddy and cotton (both from a divine couple Waren La and Phungtang Majan) — in which maize is considered as companion of these two crops. Further, in a legend⁵ related with two brother-spirits of Kachin, the Nungsu, — it is said that one of them has sown simultaneously aus-paddy, maize and other crops. In any case it seems, that according to Kachin tradition their forefathers, side by side with paddy — the staple crop — cultivated also maize.

Meo, as reported by Porebski⁶, has a tradition that when they settled in Yü-Nan before their migration southwards, some news were current among them of a wonderful maize growing in Sang Mu Van (Tonkin) — with a stem bearing three ears and with paddy arising from its top and tomatoes at the bottom. Therefore, when starvation threatened them due to the unexpected snow fall, they left their villages and started for Sang Mu Van.

In the present stage of our investigation it is not possible to answer whether Meo cultivated some varieties of maize already in Yü-Nan or became acquainted with it when they reached Tonkin. It must be pointed out here also that tomatoes are of the post-Columbian American origin, which in any case gives us terminus post quem for the discussed version of this legend, while several-

¹ Per. com. Dophunga (Chongthu) (ca 82 years) — Kolasib 14. V. 1960.

² Antony Gilchrist M. Call (Mjr), *Lushai Chrysalis*, London 1949, p. 170.

³ G. Gilhodes (Rev.), *The Kachins. Religion and Customs*, Calcutta 1922, Foreword.

⁴ G. Gilhodes (Rev.), *Mythologie et Religion des Kachins (Birmanie)*, „Anthropos“ III, 1908, pp. 678, 688, 689.

⁵ G. Gilhodes (Rev.), ib. „Anthropos“ IV, 1909, pp. 113—114.

⁶ Lesław Porebski, *300 dni w cieniu bambusa*, Warszawa 1960, p. 156.

eared maize represents a type widespread in the mountains of South-East Asia.

Mangarais (Western Flores)¹ have a myth after which as the first men had only fruits to eat, one family on the order of Mori Kéraeng — the Supreme Being, killed a couple of children whose bodies have subsequently metamorphosed: the boy into the maize, the girl into the paddy. Riung (Central Flores)² have a similar myth about the first human couple Tézé and Léna which having at first no crops for cultivation killed two children from whom maize, paddy and other plants emerged. Western Toradja (Central Celebes)³ have a legend about one mother who seeing her children hungry killed herself in consequence of which paddy arose from her body, maize from the teeth and a gourd from one knee. According to Kruyit, as emphasized by Hatt⁴, the opinion of this Toradja that they had first become acquainted with maize, then with paddy, can be only understood, if we admit that Job's tears cultivation preceded in Central Celebes that of paddy and the first plant has been replaced to some extent by the much later introduced maize. Hatt⁵ remarks also that in Indonesia we meet a greater number of myths concerning the origin of paddy cultivation than that of maize.

A decisive solution of the dilemma: pre- or post-Columbian introduction of maize into Asia, could be expected — besides the possible paleobotanical and archaeological data — after a detailed investigation of the written sources. Nevertheless all references known up till now can offer us only some indications for further studies.

The Buddhist version of the historical chronicle *Vamśavalis*, compiled and written around the year 1800⁶ in the Parbatiya

¹ Hatt, *The Corn Mother...*, p. 887/888.

² Hatt, *ib.*, p. 888.

³ Hatt, *ib.*, p. 886.

⁴ Hatt, *ib.*, p. 883 after: Alb. C. Kruyit, *De West-Toradja's op Midden Celebes*, I—IV Verhandlingen der Koninklijke Nederlandsche Akademie van Wetenschappen, Afdeeling Letterkunde, N. R. Deel XL, Amsterdam 1938, IV, p. 230.

⁵ Hatt, *ib.*, p. 886ff.

⁶ Luciano Petech, *Mediaeval History of Nepal (ca 750—1480)*, Roma 1958, p. 8.

(Khas) language by a monk of the Mahabodhi vihara at Patan and translated into English about 1876 under the direction of Dr Wright¹ by the local translator Shew Shunker Singh assisted by a pandit Gunanand² is an important source, throwing some light on the age of maize cultivation in Nepal, and up till now overlooked in the polemics concerning the discussed problem.

The Brahmanist version of this work written in 1834, also in the Parbatiya, by Siddhi Narayan of Deo Pattan, was considered by Gurkha, as remarked by Lévi³, as the only authentic. It is of course easy to understand in the light of the social and political conditions of that time in Nepal. Nevertheless according to Landon⁴ the Buddhist version is perhaps the safest source to the history of Nepal and even this part which concerns the XVIIth century has some critical value.

We find there (V, 14)⁵ — as already pointed out by Lévi⁶ and Landon⁷ — the following passage concerning the reign of king Jaga Jyotir Malla of Bhatgaon (ca 1617—1633)⁸: „In this reign some Indian corn (maize) was by chance brought from the east, mixed up among a quantity of mās or urd dāl (a kind of pulse). The clever people of the country were immediately assembled, and decided that this new grain would cause a famine so that it was thought best to send it back whence it had come, and to destroy all the ill luck it might have left behind, Brāhmins were fed, and the gods worshipped“.

According to the opinion of two experts on the old Nepalese literature and history i. e. Field Marshal Sir Kaiser Shamsheer Jang

¹ History of Nepal translated from the Parbatiya by Munshi Shew Singh and Pandit Shri Gunanand with an introductory sketch of the country and people of Nepal by the editor Daniel Wright — Cambridge 1877.

² Sylvain Lévi, *Le Népal — Étude historique d'un royaume hindou*, Paris 1905, I, pp. 193/194; Landon, *Nepal* II, p. 227.

³ Lévi, *ib.*, p. 193/194.

⁴ Landon, *ib.*, II, pp. 227, 229.

⁵ Transl. Wright, p. 190.

⁶ Lévi, *ib.* II note 1 to p. 240.

⁷ Landon, *ib.* I, p. 56.

⁸ Petech, *ib.*, p. 166; Lévi, *ib.* II, pp. 240/241.

Bahadur Rana¹ and Purna Harsha Vajracharya² the above mentioned relation can be considered credible. Nevertheless they cannot indicate any other written source by which it could be confirmed.

It may be added here that in *Vamsavalis*³ in the chapter devoted to the Suryavanshi dynasty (which after Petech³ had preceded the Thakuri dynasty beginning about 750 A. D.) in the passage (II, 18)⁴ describing the reign of Vrikshadeva-varma, the introduction to Nepal of some grain-crop cultivation, judging from the whole context of the paddy, is mentioned while we cannot find there any allusion to the maize cultivation.

As pointed out already by Laufer⁵ many Chinese works of XVIth century A. D. mention the maize. The oldest known information concerning this plant, given by T'ien I-heng — a scientist living probably in the middle of XVIth century — is included in a Chinese encyclopedia published in 1735. We learn from there that maize was cultivated in Tibet (Hsi-fan) and formerly given to the emperor's court as a tribute, for which reason it has been named *yü-mai* 玉米 („emperor's wheat“), while its previous name was *hsi-fan-mai* („Tibetan wheat“). Pen ts'ao kang mu, compiled from the extracts of 800 more ancient authors and published in 1590 by Li shih-chen a herbalist living in the second half of XVIth century in Ki-chou (Hupeh)⁶, is a further important source. The description⁷ of maize found there shows according to Merrill⁸ that it was a variety of pop corn, while its illustration seems to have been executed by a person who never saw this plant. Its name is already *yü-shu-shu* 玉蜀黍 („gemlike sorghum“)⁹.

¹ Per. com. Kathmandu 14. II. 1960.

² Per. com. Kathmandu 19. II. 1960.

³ Petech, ib., p. 1.

⁴ Transl. Wright, p. 118.

⁵ Laufer, *The Introduction...*, pp. 225—235, 247—248.

⁶ E. Bretschneider, *On the Study and Value of chinese botanical works with notes on the history of plants and geographical botany from chinese sources*, Peking 1870, pp. 2, 18.

⁷ After the translation of Dr S. Y. Hu, see: Merrill, *The Botany...*, p. 373.

⁸ Merrill, ib., p. 373.

⁹ Weatherwax, *Indian Corn...*, p. 133, comp. Bretschneider, ib., p. 18.

The author of the herbal, as emphasized by Merrill, declared even himself that he was not acquainted with maize, which was very rare at that time, and was cultivated to some extent in Szechwan and undoubtedly introduced to China from the west. According to Bretschneider¹ Li was the first critical Chinese writer on natural sciences. Nevertheless, as he states further² „... on the whole it can be said of the Pen ts'ao, that the descriptions of plants therein are very unsatisfactory“. Nung Cheng Ts'uan shu³ belonging approximately to the same period mentions laconically that the grains of maize were brought to China from a country called Si-fan. There is certain diversity of opinions concerning the geographical localisation of this country. Laufer identifies⁴ Hsi-fan with Tibet, Jeffreys⁵ following Hance and Mayers — with Inner Mongolia.

The earliest known European report on the maize cultivation in China is to be found⁶ in *Historia de las cosas mas notables ritos y costumbres del gran Reine de la China* of the Spanish monk Juan Gonzales de Mendoza, based on the relations of other monks, particularly of Martin de Herrada, and published in Rome in 1585. We read there (I; —III, 4) that in Fukien — then in 1577⁷ (or 1575)⁸ when Herrada visited this region — the cultivation of maize was so extensive that the annual tribute given to the Chinese emperor surpassed 20 millions fanegas, what was probably equal to about 11 millions of hectoliters. Judging from the area required for such cultivation Laufer supposed that the introduction of maize into Western China took probably place around the year 1540⁹, as

¹ Bretschneider, ib., p. 2.

² Bretschneider, ib., p. 6.

³ Jeffreys, *Pre-Columbian Maize in Asia*, p. 26.

⁴ Laufer, ib. pp. 233, 249.

⁵ Jeffreys, ib., p. 27, after: H. F. Hance, W. F. Mayers, *Introduction of Maize into China*, „The Pharmaceutical Journal and Transactions“, December 31. 1870, p. 523.

⁶ Laufer, ib. pp. 235/237.

⁷ Laufer, ib. p. 235.

⁸ Jeffreys, ib., p. 26, after C. R. Boxer, *Maize Names*, „Uganda Journal“, Vol. 16, 1952, p. 179.

⁹ Laufer, ib. p. 251.

it could have reached Fukien around 1560 and not later than 1570.

The source which is suspected by Jeffreys¹ to contain an allusion to the pre-Columbian cultivation of maize in Vietnam is *Chu-Fan-Chi* written by the Chinese historian Chau Ju-kua probably in the middle of XIIIth century². In the description of Annam (Chan-ch'ong) we have there the following passage (I, 2)³: „The people usually plough their fields with two buffaloes. Among the various kinds of cereals they have no wheat; but they have millet, hemp and beans“ and further: „As to fruits, they have the lotus, sugar-cane, bananas and cocoanuts“. Considering the short note of Hirth and Rockhill⁴ added to the above mentioned text: „‘Su’, which is rendered by ‘millet’ in the text, is in more modern works used for ‘maize, Indian corn’“, Jeffreys⁵ remarked: „Bearing in mind the accompanying crops that in Annam go with this Su, namely cocoanuts, bananas and sugar cane and a high rainfall, one can presume that Su in this context means maize, for there is no other cereals except rice, that could be succesfully cultivated under these conditions“.

Nevertheless some sceptical attitude toward such an attempt of interpretation seems to be justified in the present stage of research. It may be remarked here also that among the products of Tonkin (Kiauchî) enumerated by *Chu-Fan-Chi* (I, 6)⁶ only cotton is mentioned among the plants.

The source which has stimulated the discussion about the possible pre-Columbian cultivation of maize in the Philippines, then before Portuguese and Spaniards appeared in this region, is *Primo viaggio intorno al mondo* written by Antonio Pigafetta who accompanied Magellan in his voyage around the world in the years 1519—1521.

¹ Jeffreys, *ib.*, p. 21.

² Chau Ju-Kua, His work on the Chinese and Arab Trade in the twelfth and thirteenth century entitled *Chu-fan-chi*. Translated from the Chinese and Annotated by Friedrich Hirth and W. W. Rockhill — Introduction — note 3 to the p. 35.

³ Transl. Hirth — Rockhill, *ib.*, p. 48.

⁴ Hirth — Rockhill, *ib.*, note 6 to the p. 50.

⁵ Jeffreys, *ib.*, pp. 21/22.

⁶ Transl. Hirth — Rockhill, *ib.*, p. 46.

Jeffreys¹ has pointed out that in the Pigafetta's description of the Philippines we find the following reference: *cani gate rizo, millio, panizo, sorgo, gengero...* (in which *millio* replaced according to him the usual name *miglio*) as well as the list of names of the four cultigens in the Italian and in Cebu natives languages: *al rizo*=*bugha, barras*; *al miglio*=*humas*; *al sorgo*=*batat*; *al panizo*=*dana* — which designate according to him, one after another: paddy, maize, sorghum and millet. The identification of the words *al miglio*=*humas* with maize is authorized, as suggested by Jeffreys² by the passage of the Pigafetta's description of his sojourn in Brazil (1519) in which one of the plants cultivated and named by the aborigines *mahiz* — most probably the maize, as indicated by the whole context — is designated by the name *al miglio*. Jeffreys³ points out also that in the description of Magellan's arrival to the eastern shores of the Sama Island, there is a mention of the natives having presented the newcomers with their products among which was the plant named *humas* which, according the translation of Richardson (1789), was just the maize.

Merrill⁴ following Robertson⁵ expressed a different point of view identifying *al panizo*=*dana* with the species *Setaria italica* L. — widespread in the Philippines and Malaya — and *al miglio*=*humas* — with the species *Panicum miliaceum* L. — cultivated there too, as well as in India and in China. Merrill remarked also that no plant in the Philippines bearing in the local language the name *humas* is known at present.

It seems that the identification *al miglio*=*mahiz*=maize is confirmed by the fact that among the tribal names of maize in South America met with by Birket-Smith⁶, we find just the word *mahiz*, which besides the words *mayz* and *maysi*, is applied by the Taino —

¹ Jeffreys, *Pre-Columbian Maize in Asia*, pp. 23/24 after: J. A. Robertson, *Magellan's Voyage Around the World by Antonio Pigafetta, The Original Text of the Ambrosian M. S. with English Translation, Notes, Bibliography and Index*, Cleveland 1906, I, pp. 182, 186, 187.

² Jeffreys, *ib.*, pp. 23, 24.

³ Jeffreys, *ib.*, p. 24 after: *A Collection of Voyages*, Published by Richardson et als., London 1789, p. 496.

⁴ Merrill, *The Botany...*, p. 364.

⁵ Robertson, *ib.* I, note 370 to the p. 269.

⁶ Birket — Smith, *The Origin of Maize...*, p. 20.

an Arawak tribe of Brazil. The below quoted opinion of Weatherwax¹ concerning the problem of early maize cultivation in North Africa may serve as a warning against too hasty identification of *al miglio* = *humas* = maize: „Nearly three hundred years after the discovery of America, travelers visiting the Gold Coast of Africa found that there was still much confusion about the identity of corn and the sorghums and the names applied to them“. We should remember that in West Africa maize, as reported by Jeffreys² after de Souza, was called in the XVIth century *milho* de Guiné, while sorghum, as mentioned by Russel³, is called there up till now Guinea corn.

Nevertheless, that Pigafetta knew how maize looks, is proved according to Jeffreys⁴, by another passage of his account in which he compares the fruits of one pepper species to the cobs of the „fromentone della India“. It is also, writes Jeffreys, the earliest (1521) known appearance of that name — used later on — we may add after Finan⁵ in the herbals of Cordus as *Milium Indicum* (1552) and *Frumentum Indicum* (1561).

Merrill⁶ from his side pointed to the relation of Diego Lope Povedano, the first governor of Negros, written in 1578, then 13 years after the settlement of Spaniards on this island — in which the author mentions four cereals cultivated there, i. e. paddy, sorghum (*batad*) and two species of millet (*Panicum miliaceum* L. and *Setaria italica* Beauv.) and remarks that he did not see maize (mais) there.

We may quote here also the opinions of two authors of the XIXth century, concerning the introduction of maize into the Philippines. Then Jagor⁷ (1875) writes: „The Spaniards have

¹ Weatherwax, *Indian Corn...*, p. 5.

² Jeffreys, *Pre-Columbian Maize in Africa*, p. 960.

³ T. A. Russel, *West African Crop-Plants*, pp. 1, 4.

⁴ Jeffreys, *Pre-Columbian Maize in Asia*, p. 24 after: Robertson, op. cit., II, p. 154.

⁵ Finan, *Maize in the...*, pp. 160, 164.

⁶ Merrill, *The Botany...*, p. 365 after: P. Ignacio Rebeca, *An Annotated Translation of the Povedano Manuscript* (1578), I—IX; 1—78; 1—13 (Index and Bibliography) Type written thesis — Far Eastern University — Manila 1951.

⁷ Jagor, *Travels in...*, p. 151.

imported... maize, coffee, sugar-cane, cacao, sesame, tobacco, indigo, many fruits and probably batata“, while Delgado¹ (1892): „El maiz es otra especie de frumento común; ya se siembre bastante en Visayas y Tagalos, pero creo que no es planta propia y natural de esta tierra, sino traida de la Nueva España“.

In any case the problem of the time of maize introduction into the Philippines cannot be considered at present as finally solved and all the above mentioned references require a careful verification. Maybe the study of the local Malayan literature² would be also fruitful for this investigation.

Summarizing, if we take into consideration all paleobotanical finds of maize in Mexico and adjacent areas, it seems that it is the region of the world where we should search the centre of its domestication. Nevertheless, the investigation is far to be closed and we must always be ready for some unexpected revelation.

As to the problems whether Asiatic forms of maize have only American origin, and if so, whether they were introduced to Asia in pre- or post-Columbian times, across the Pacific or Atlantic, and due to the maritime activity of such or other people — the divergence of opinions, as presented above, is quite surprisingly great. It may be added that this divergence depends sometimes even on the different interpretation of the same sources, the same names etc. It seems that this situation is to a great degree caused by the lack of suitable basis for the conclusions, which are often drawn from fragmentary materials. The author's point of view is, that it is still too early for the solution of the majority of the discussed problems and that it should be preceded by a larger accumulation of the historical, linguistical, ethnographical, archaeological, paleobotanical, taxonomical and cytogenetical data. Nevertheless, it is quite obvious that the extant materials permit already several conclusions and even solutions of certain detailed problems.

¹ Juan J. Delgado (Padre), *Historia General Sacro-profana, Política y Natural de las islas del Poniente llamados Filipinas*, Tomo Unico, Madrid 1892, p. 707.

² After per. com. of a filipinian geologist from Cebu City Mr. Recaredo C. Arco (Calcutta 5. X. 1960), maize is mentioned in the old Malayan literature written in the so called Filipiniana language.

When we look into the distribution of the primitive maize cultivation in South-Eastern Asia — determined on the basis of the obtainable ethnographical and historical data — it appears, that the greatest, more or less compact area with certain fissures caused by a natural environment, stretches equatorially with some ramifications northwards or southwards, and mostly on the mountain zones. It comprises: Central and Eastern Nepal, Sikkim, Bhutan, South-Eastern Tibet, Assam, Burma, Western and Southern China, Northern Thailand, Laos and Vietnam. Most probably certain regions of Transcaucasia, Armenia, North-Eastern Iran, Afghanistan, Kashmir and Turkestan, where the cultivation of some peculiar varieties of maize is to be noted, sometimes inside the more advanced system of agriculture, may be considered as its old prolongation.

Besides the main area we can trace also the maize cultivation on its southern peripheries, spottily dispersed on the adjacent islands like Celebes, Flores, Cebu, Luzon, Hainan etc.

We can observe the greatest importance of that cultivation in the following regions: 1. from Central Nepal along the Lower Himalaya to the Northern Assam; 2. South-Eastern Assam (E. Lushai Hills) and Western Burma (Chin Hills); 3. Eastern Burma (Kengtung area) and adjacent regions of Thailand; 4. spottily in Northern Vietnam and South-Western China; 5. Cebu Island. The highest extensity is to be noted for instance among the Monpa (NW Assam) and the Meo (N. Laos, N. Vietnam).

The interpretation of this distribution cannot only follow the rules of the abstract-geographical method, but must of course take into account all climatical, topographical as well as historical and ethnographical factors.

The determination of the age of maize cultivation in Asia and in its particular areas is a far more complicated problem. The linguistic and ethnographical data permit us, without applying to them any exaggerated value, to draw some inferences as concerning the relative chronology and succession in the introduction of crops to the discussed aboriginal cultures.

For instance the study of the geographical distribution of the names of maize revealed us the striking similarities or even identi-

ties among the names of such a distant people like Kiranti (E. Nepal) and Viet (N. Vietnam); Lepcha (Sikkim) and P'u Noi (N. Laos); Kiranti, Tibetan and Tsa Khmu (N. Laos). Taking into consideration the history of migrations and their directions in this part of Asia, more probable seems the common origin of the names being compared, than their direct transplantation for such great distances. The first explanation is of course in favour of their antiquity, reaching the time when these peoples were living closer to each other. Nevertheless we must also have in mind the possibility that even great similarities may be sometimes only a matter of a strange coincidence.

Some indications can offer us a detailed analysis of certain composite names of maize. For instance: Chinese *yü-shu-shu* (*yü* = gem; *shu-shu* = sorghum)¹, Tibetan *brasmo-spos-sel* (*brasmo* = paddy; *spos-sel* = amber)², Lao *khau-saly* (*khau* = paddy, *saly* = maize in Tsa Khmu language)³, Western Tai *khau-phwa* (*khau* = paddy, *phwa* = sky)⁴, Ao *moya zung-khua* (= Sema lentils), Sema *kola-kithi* (= foreigner's Job's tears) and eventually Kachin *khainnu* (comp.⁵ *khau* = paddy in Tai) and Garo *mikop* (*mi* = paddy)⁶ suggest that maize has been introduced to these peoples rather later than the crops indicated by its names.

The comparatively simple names, some of which have no other meaning than maize, are to be found among Nevar (*kani*)⁷, Kiranti (*syal*), Lepcha (*kup*, *nok*, *dum*)⁸, Adi (*sapa*), Lhota (*moro*), Jayntia (*saru*)⁹, Haka (*kom*)¹⁰, Viet (*ngo*, *bap*) etc. and seem belong to the older formation.

¹ comp. Weatherwax, *Indian Corn*, p. 133.

² Jäschke, *A Tibetan...*, pp. 332, 400.

³ Roux, *Quelques minorités...*, p. 351.

⁴ Needham, *Outline of the...*, p. 159.

⁵ Comparison suggested by Dr B. D. Shastri, per. com. — Shillong 2. V. 1960.

⁶ D. S. Nengminza, *The School Dictionary — Garo into English*, Tura, 1946, p. 82.

⁷ Wright, *Vocabulary*, annexed to the English translation of *Vamśavalis*, p. 303.

⁸ Per. com. Tamsang — Kalimpong 11. XI. 1960.

⁹ Per. com. Lyngdoh — Tura 2. IV. 1960.

¹⁰ Per. com. Robert Khenmang (Haka) — Aijal 30. VII. 1960.

The fact emphasized already by Laufer¹, upheld by Anderson² and verified by the author³ that the Lepcha have an extremely developed nomenclature concerning the particular elements of maize, is also in favour of the antiquity of its cultivation among this people.

Further, after the confrontation of the historical traditions, myths and legends concerning the cultivation of crops, it seems almost sure that among such peoples like for instance Lepcha, Monpa and Lushai, maize belongs to the older set of crops, while paddy appears clearly as the later acquisition due to migrations and contacts of these tribes with the plain's peoples. A prevalent number of the mountain tribes in the western part of South-Eastern Asia, better investigated from this point of view, consider maize and paddy as being more or less equally ancient. On the other hand, the Tai from Vietnam, have for instance a cosmogonic myth in which we find only that the mankind has obtained from the sky 330 varieties of paddy⁴, while there is no mention of the maize. It may be reminded here that Tai, as remarked by several authors⁵, are fundamentally a plain's people preferring paddy cultivation. Nevertheless we cannot omit here the above discussed Phake version of the Western Tai tradition about the kings Hkunlung and Khun-lai, supposed have to reigned in VIth century A. D., in which maize is mentioned along with paddy, sesamum etc., although the late interpolation of this mention seems to be the most probable.

The allusions, which Jeffreys supposes to apply to the maize cultivation, one in the Chu-Fan-Chi's account referring to Tonkin in the XIIth—XIIIth centuries and the other one in the Pigafetta's account referring to Negros at the time of Magellan's arrival in 1521 must be treated with great reserve as they need careful verification.

The date 1577 (or 1575) for which Mendoza's relation testifies an extensive cultivation of this crop in Fu-kien is the first certain

¹ Laufer, *The Introduction...*, pp. 242/243.

² Stonor—Anderson, *Maize among...*, p. 388.

³ As ⁸ on the p. 289.

⁴ Roux, *Quelques minorités...*, p. 377.

⁵ Le May, *The Culture of South East Asia—The Heritage of India*, London 1956, p. 45; Roux, *ib.*, p. 149.

chronological support and the terminus ante quem of maize introduction to South China.

The reign of Jaga Jyotir Malla, then the years ca 1617—1633 during which, according to *Vamsavalis*, the grain of this crop was brought to that country and unwillingly received, can be considered, it seems, as terminus post quem of maize introduction to Central Nepal.

An approximate terminus post quem of maize introduction to South-Eastern Assam can be eventually deduced, on the basis of the developed and detailed historical traditions of Lushai and Hmar tribes as the time around 1700 at which they migrated from Burma carrying with them their ancient crops.

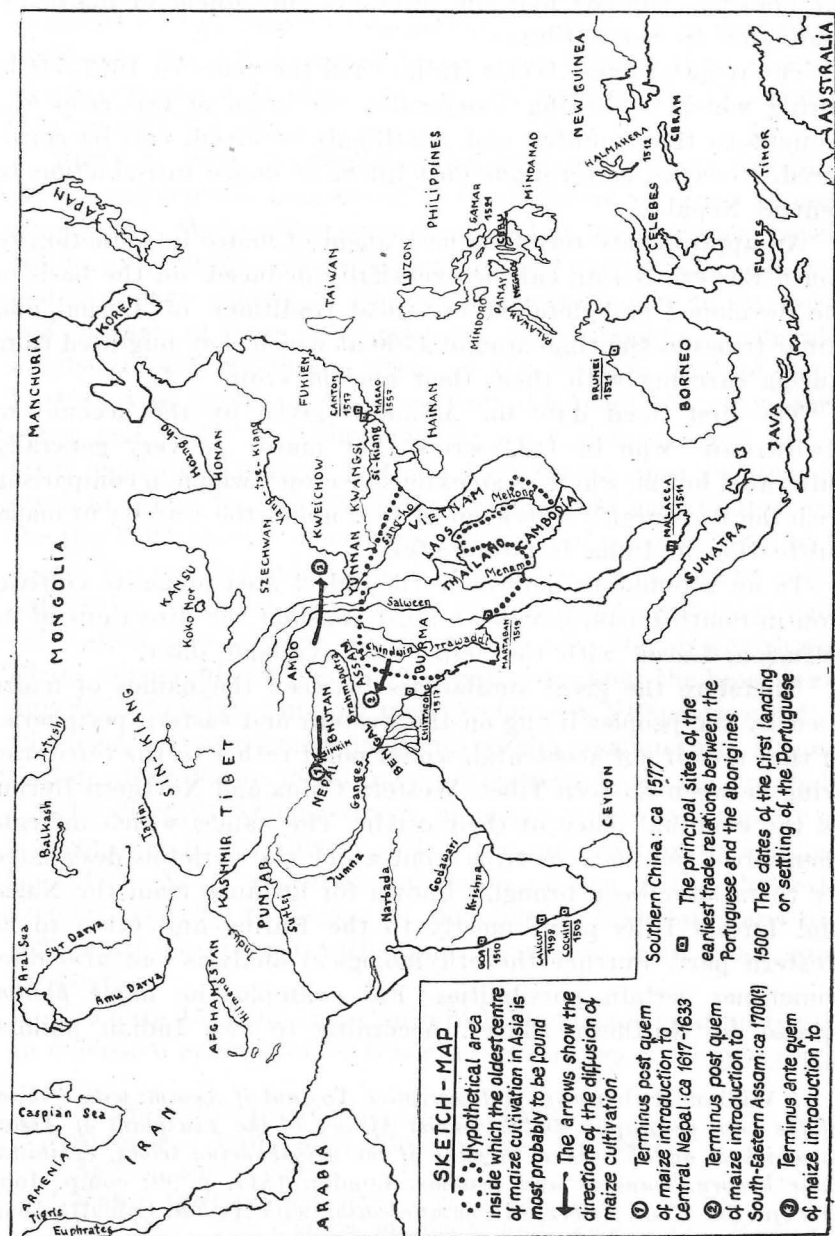
The first fixed date for Assam is given by the account of Robinson¹ who in 1841 wrote that maize „is very generally cultivated but no where as an extensive crop“, which in comparison with the Roxburgh's statement of 1832 about the scarcity of maize cultivation in India is meaningful.

In an attempt to determine the oldest area of maize cultivation in South-Eastern Asia we must consider the directions of its diffusion, traced with the help of all available data.

Therefore the great similarities between the names of maize used by the peoples living on the western and eastern peripheries of that area if not accidental, would point rather to the territories lying between Eastern Tibet, Western China and Northern Burma as the eventual place of their origin. The names which indicate themselves the place or tribe from which the varieties designated by them have been brought, known for instance from the Naga and Lushai Hills point mostly to the Burma and often to its western part. Further the ethymological analysis can also offer sometimes certain possibilities. For example the name *bhutta*, spread in Northern India², according to two Indian philolo-

¹ William Robinson, *A Descriptive Account of Assam: with a sketch of the local geography and a consise history of the Tea-plant of Assam to which is added a short account of the neighbouring tribes, exhibiting their history, manners and customs*, London 1841, p. 90; comp. John Owen, *The Naga Tribes, in communication with Assam*, Calcutta 1844, p. 125.

² Watt, *A Dictionary of...*, p. 327.



gists: K. B. Barua¹ and B. D. Shastri² can be derived from the Sanscrit *Bhot* 'Tibet'. Some indications of the diffusion of maize cultivation can be drawn also from the historical traditions, myths and legends.

For instance the Tibetan legend about the monkeys points to the possibility of a larger previous maize cultivation in South-Eastern Tibet. According to the Lushai tradition, as mentioned above, they brought maize to Eastern Assam from Burma.

Finally the Nepalese historical chronicle suggests the eastern origin of maize cultivation, maybe introduced to Nepal from Sikkim, while several Chinese historical sources agree on its introduction to China from the west, then eventually from Tibet.

On the basis of all these data, it seems that we should search the oldest centre of maize cultivation in South-Eastern Asia between Western Burma, South-Eastern Tibet, Yü-Nan and Vietnam. Most probably it was the area to which maize could have been easily introduced from the seacoast. Considering the ways of maize diffusion in that part of Asia, it seems to be rather improbable that it was done for instance by the Portuguese settled at Chittagong, Macao or Canton. Of course, it could have been done by them from the coasts of Burma (trade station at Martaban since 1519)³ or Thailand. Nevertheless the early — anyhow before 1577 — cultivation of maize in Eastern Himalaya renders its post-Columbian introduction a bit less probable. Which Asiatic people could be eventually responsible for it, it is too early to answer. But taking into consideration the great maritime activity of the old Viet and Cham peoples as well as the extensive cultivation of maize among some tribes of Northern Vietnam, Laos and Eastern Burma, it seems that the hypothesis of Heine-Geldern that it could have been introduced from the Vietnam coast by the people of the Dongson culture, should not be excluded. The hypothesis of Jeffreys that maize could have been carried by the Arabs across the Atlantic in the

¹ Per. com. Kumar Birinchi Barua — Gauhati 19. III. 1950.

² Per. com. Bibhabasu Das Shastri — Shillong 9. VII. 1960.

³ Arthur P. Phayre (Lt-Gen. Sir), *History of Burma including Burma Proper, Pegu, Taungu, Tenasserim and Arakan...*, London 1883, p. 265.

pre-Columbian times and then introduced from Western Asia to China through the Silk Road, seems to be far more hazardous. There is still the eventual pre-Columbian overland diffusion of maize from America to Asia across the sub-arctic regions. Not to mention the unfavourable climatical conditions for such transplantation, as emphasized by Weatherwax¹, we must point to the lack of ethnographical and archaeological data which would prove early maize cultivation between Northern Tibet and Southern Canada — the northernmost region of America for which it has been testified². Besides, we must remember that the main ethnic movements were going in that area in an opposite direction and the mutual cultural exchange between some peoples of North-Eastern Asia and Northern America is meaningless in that respect. Nevertheless we should not omit the fact, mentioned in the recently edited Chinese History³, that one of the ideograms to be found on the oracle bones from In-sü (An-yang) in Honan (the centre of Shang dynasty), is suspected to represent maize. Of course we must wait for the verification of this identification, as it sounds almost fantastically.

Up till now, although we cannot consider the problem as solved, it seems that there is much in favour of the pre-Columbian cultivation of maize in South-Eastern Asia. In any case this possibility should not be excluded.

The proof would be: the paleobotanical specimens: cobs, grains or pollen of maize, as remarked by Heine-Geldern⁴, the imprints of maize kernels on the clay pots, as pointed out by Hatt⁵ or the representation of maize in the iconographical sources as suggested by T. Lewicki⁶ — all found in the cultural context from before the XVIth century.

I. First of all the Nepalese, Tibetan, Chinese, Burmese, Vietnamese, Tai, and Malayan literature from before the XVIth century

¹ Weatherwax, *Indian Corn*, p. 137.

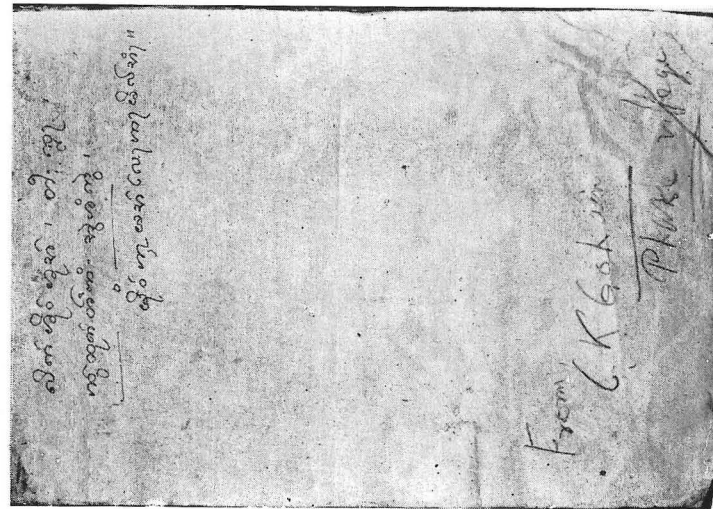
² Weatherwax, *ib.*, p. 30; Humlum, *Zur Geographie...*, pp. 33—35.

³ Szang Jüe (Red.), *Dzieje Chin — Zarys*, Warszawa 1960, p. 23.

⁴ Heine — Geldern, *Kulturpflanzengeographie...*, pp. 373, 393.

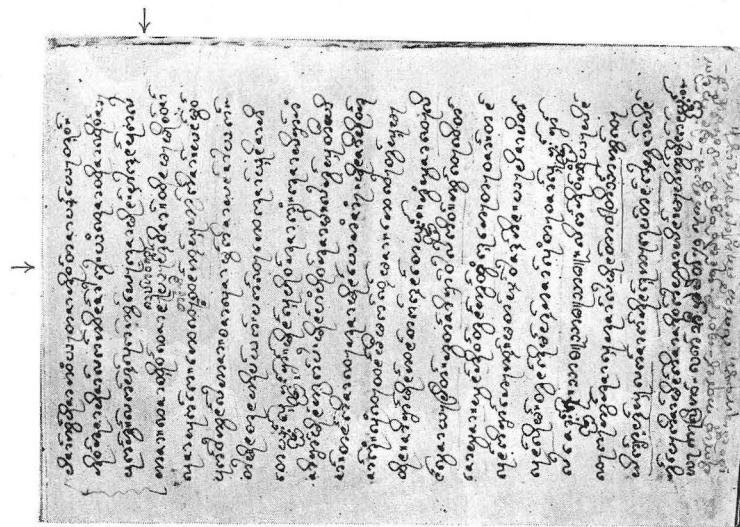
⁵ Hatt, *The Corn...*, p. 902.

⁶ Per. com. Prof. Tadeusz Lewicki, Kraków 9. IV. 1962.



a

The title page of *Lik Kho Khon Tai Phua* written in Phakial language. A copy from the end of nineteenth century belonging to Mr. G. K. Gohain from Gauhati, Assam (see p. 275)



b

The sixth page of *Lik Kho Khon Tai Phua*. The arrows show the place where the name of maize *khaun phua* is written in between the lines of the text (see p. 276)

should be carefully studied in research of eventual mentions or allusions to maize cultivation. Nevertheless, the criticism, so recommended by Bretschneider¹ toward the Chinese sources in which the identification of plants is sometimes extremely difficult, should be applied more or less to every investigation of this kind.

II. Further, the supplementary ethnographical investigation of the historical traditions, myths and legends concerning maize cultivation as well as its position in the economical and religious life should be undertaken among these tribes for which we have only fragmentary data, then in some parts of Eastern Himalaya, Burma, Thailand, Laos and Vietnam.

III. The list of tribal names of maize completed for the whole discussed area should be studied in respect to their ethymology and geographical distribution, and the results confronted with the detailed history of migrations in this part of Asia.

After such an investigation it would be possible perhaps to detect the region of the oldest cultivation of maize in South-Eastern Asia, as well as to determine approximately its age.

It may be added here that the problem of the age of maize cultivation in Western Africa — so intriguingly presented by Jeffreys — is not without meaning for the discussed field of research.

In any case a detailed study of the Portuguese and Spanish archives concerning their commercial activity in the XVIth century could eventually throw also some light for the question of the time of the introduction of maize into South-Eastern Asia and Western Africa.

¹ E. Bretschneider, *Botanicon sinicum* — *Note on Chinese Botany from Native and Western Sources*, Part III, Shanghai, Hongkong, Yokohama & Singapore 1895, pp. 6, 20, 23.