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Studies in the History of some Common Commodities.

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Introduction.

The subject which I have taken for discoursing upon in this and succeeding articles, must interest students as well as laymen for various reasons. It is advisable that everybody has some knowa[illegible]e of the articles which are in daily use for diet, dress or other p[illegible]oses. It may not be very necessary for the enjoyment of the a[illegible]icles—the necessaries and luxuries—to know something of their history. It is quite easy, for instance, to be an expert in eating a thing or enjoying a certain luxury without an at[illegible]n of knowledge in connection with its origin and history. Ignorance does otn interfere with the intensiveness of the liking for the commodity ! If one eats an orange, for instance, it is the same to one whether it is the indigenous product of India or whether it is an exotic one. He need not care whether it played a part in early Indian trade or not. He need not care whether India gave it to others or got it from others. Similarly when a man wears a peculiar kind of dress he need not make himself happy or unhappy by inquiring into the origin and history of the type. Perhaps such a knowledge will make many orthodox people unhappy ! It is possible, in short, to use things without any knowledge of them just as it is possible to write good literary style without much theoretical gramma[illegible]the lore. Still, just as a good knowledge of a language is not [illegible]ct its without a knowledge of its grammar, similarly our [illegible]ustralia countries may be more intelligent if we know something of th[illegible] [illegible]vation was wild habitat and that th[illegible] [illegible]s passed till t[illegible] [illegible]tact to have [illegible]tly more recen[illegible] [illegible]dia, Central Asi[illegible]

...arm in having a knowledge of their history. The ...grains we eat, the dress we wear, the fruits we relish, ...es we take, must be necessarily interesting. What I ...o do in this series of articles is to give an idea of the rich ...t material for investigation which lies in this direction. The ...ect has been considerably exploited but not in all aspects. ...storical investigation in particular requires to be systematically taken up by learned bodies all over the country. I shall only suggest a few points in elucidation of the subject, just to indicate the important line of research open to an intelligent student of history.[1]

The plan I propose to adopt is to deal with the history of the commodities as they can be classified into various uses. I shall first deal with the eatables, both necessaries and luxuries, like the various grains, pulses, fruits and drinks. I shall then deal with the important spices, drugs and narcotics in use among the people. Precious metals and gems will then be considered, and lastly miscellaneous articles like paper, glass, etc. It is not possible of course to exhaust all the subjects under each heading. Such a task will require a large and detailed investigation by a body of scholars in the different departments of the sciences and arts. I shall content myself with a few suggestions which, it is possible, may require revision in the light of fresh data or better interpretation of the existing data.

Section 1.

Articles of Food.

Amongst the articles of food which can be first taken up, the cereals or grains first demand our attention. Of the cereals, rice is the most common article of consumption. I shall, therefore, first deal with it and then pass on to wheat and other grains and pulses.

Rice.

Everybody will acknowledge that the word *rice* is the same as the Sanskrit *vrihi*, the *arisi* of Tamil, the *aruz* of Arabic, the *biranz* of Persian, the *rai* of Malayalam and the *ara* of Tulu. It ... believed by Caldwell and others that *arisi* must have become

[1] ... the books I have consulted, three recent special ... publications, namely, the ...*ual* (Vol. III), Sir George Watt's *Commercial Products of India* (1908) ...e Birdwood's *Records of the India Office* (1890). They are very valuable ...ation.

popular in the world after the Tamil name which was naturally current in Malabar, the part of India with which the earliest traders of the west became acquainted. It has been generally believed that *arisi* was a Dravidian article learnt later on by the Aryans. It is indeed possible to argue that *arisi* was derived from the Sanskrit *vrihi*, but the argument against the theory that the Dravidians borrowed it from the Aryans is that the latter were first acquainted not with rice but with barley or wheat and that they came to learn of the existence of *arisi* only after they advanced into Hindustan. Rice is not mentioned in the Rig Veda, but occurs in the *Adharva-veda*, the *Brahmanas* and the *Upanishads*, showing thereby that, by the time when the Aryans advanced into Hindustan, rice became a common article of food, though a considerable portion of the population in the north continued to eat wheat as they do even now. We have to take it, in this case, that, just at the time when the Aryans were beginning to use it in Aryavarta, western countries were getting it from South India.

It must be acknowledged however that the theory of the Dravidian origin of rice has been questioned by some of late. There is a considerable literature in connection with the original habitat of the grain. It is a very wide tropical product, found equally in China,* Australia and India, and it is difficult to be dogmatic about Indian origin. Again, it has been suggested that the word *rice* should not be traced to the Tamil *arisi* but the Persian *biranz*. According to this view, the Sanskrit *vrihi* was derived from the Persian term, and the Indo-Aryans knew its use in their common original home, that is, even before they came to India. This theory, however, cannot stand much scrutiny for two reasons. In the first place the Persian word itself *might* be traced to Tamil.

* "Writers are agreed that the earliest mention of rice cultivation is connected with China, where, according to Stanislas Julien, a ceremony was celebrated in 2800 B.C. by Emperor Chin-nung, in which the sowing of five kinds of grain, one being rice, is the chief observance. This, together with the well-known adaptability of large portions of China to rice cultivation, led De Candolle to presume the plant may have been a native of that country. He does not, however, restrict its wild habitat to China, but admits it has been found both in India and Australia under such conditions as to allow of little doubt that it is native to these countries as well." (Watt, p. 825). De Candolle believes that Indian rice cultivation was subsequent to China, though ancient. Watt says that "the chief wild habitat of the plant to-day is roughly from Southern India to Cochin-China" and that this "coincides with the region through which the Dravidian invaders passed till they culminated in the Tamil civilization. Cultivation appears in fact to have ... B. C. and at perhaps a slightly more recent ... throughout India to Persia, Central Asia ... and ultimately to Egypt and Europe" (*Ibid.* p. 825).

Secondly, the absence of the mention of the Article in the Rig Veda seems to be sufficient to indicate the Aryan ignorance of the grain at first. A corollary of this theory is that the Sanskrit *nivara* which, I believe, occurs for the first time in the *Sukla-yajur-veda*, was an adaptation from the non-Sanskrit *nellu*, and the Sanskrit *kanchika* (gruel) from the non-Sanskrit *kanji*. On the other hand as cooked rice is known as *pattu* in Tamil (with which may be connected the Kanarese *pattu* and the Telugu *vadlu*) and as all these words are apparently derived from the Sans. *pach* (पच), to cook, one is tempted to suppose that the art of cooking rice was introduced by the Aryans, unless we suppose that *pach* came from a root common to both.

The question of the original habitat of rice has to be studied in detail on the basis of the recent Sindh discoveries. Strabo refers in the first century to some grains in the Indus valley which resembled wheat. It has now been ascertained that that grain was a type of rice indigenous in a wild manner to that valley. The question naturally rises whether this type was cultivated by the 'Indo-Sumerains' of the valley whose remains have been unearthed in recent years. If this was the case we might have a clue to the origin of the cultivation of rice among these people. The spread of the grain to China in the east and to Egypt, Babylon, etc., in the west, might have then taken place through them. Both the Aryans and the Dravidians too might have received the art of cultivation from them. The question remains to be investigated, and it may be that we have to entirely revise our opinions regarding the history of the grain.

In any case in the post Rig Vedic period the article became so common among the Aryans that it seems to have been known by the general name of *dhanya*. When rice became common in the land, it was naturally an article of trade over a distant area. Primarily as a food grain and secondarily as the source of *sura* it is mentioned by Manu. It has been found in the ruins of Central Asia, between the third and 8th century A.D. Linschoten refers to the sura manufactured from rice about 1600. The *Chudamani-nigantu* gives the names *vari*, '*sol*, *vrihi*, '*sali*, *yavam* and *nel* for ddy ; *nannel* and '*sanjali* to red paddy ; *aivana* to the mountain ; *torai* to the field grain and *nivara* to the tank variety. It Sanskrit term *tandula* for rice.

Barley (*Yava.*)

This grain is one of the earliest to be cultivated by man. Further, it is more or less universal and therefore it is difficult to say where it originated. It was one of five grains cultivated in China about 2700 B.C. It was an article of food in the time of Solomon about 1000 B.C. It has been found among the earliest Egyptian monuments. Above all it figures in Vedic literature as *yava*, giving rise to the Javanese *jaba*, the Mahratta *vaji*, the Kanarese *jarva*, etc. From the facts that it occurs in its Aryan name throughout the world, that it is used in the Rig Veda synonymously with *dhanya*, that it has always been chosen as the goldsmith's weight in India, that it has been specially called the corn ripened by the favour of Indra (hence the name *Indraja* for it), and from the important part played by the grain and its extract—the *sura*—in the Vedic times, we have to infer that it was the favourite article[1] with the Aryans of India. Naturally, it was an article of early international trade. Barley has been found in the ruins of Khotan. Varthema says that an immense quantity of it was exported at Chaul in the Bombay coast in the 16th century, but Birdwood regards this as improbable. The *Aini-Akbari* refers to its large production in Afghanistan and Kashmir, as the result of which it brought much revenue on the basis of the usual levy of 20 per cent.

Wheat (*Go-dhuma.*)

It has been suggested by some scholars that the *yava* of the Vedic literature denoted not only barley but wheat. Whatever might have been the case, the Sanskrit name for the commodity *godhuma* which occurs for instance in the Upanishads, is prevalent in altered forms throughout India—the *gahun* of Mahratti, *gandam* of Persian, *gehun* of Hindustani, *godi* of Kanarese and Tulu, and *godhuma* of Tamil and Telugu. As the Portuguese came to know the article first in the Dakkan they called it *geung*. The cereal was never cultivated indigenuously in South India. It is North Indian. It might have been a native of the North-West. Wheat is a prehistoric grain found in different names in Chinese, Hebrew, and Sanskrit, showing that it was a universal article of producti[illegible] reek

1. See Barnett's *Antiquities of India*, chap. 4 for exhaustive referen[illegible] use in the different Vedic ceremonials.

but known in different places by different names. It occurs in China about 2700 B.C., in the lake dwellings of Switzerland several centuries later ; in Egypt about 3300 B.C. Wild wheat has also been found in Mesopotamia and the Indus valley, though in the last case it has been suggested that it might have been confounded with a type of rice. Watt concludes that the modern cultivation of wheat is perhaps ' more closely connected with Asia than with Europe.'So far as India is concerned wheat has been an article of food only in North India and among the peoples of the West who have come to India. Dutt refers to the 'mention of three varieties of wheat in the *Bhavaprakasika*, namely *Mahagodhuma* or large-grained, *madhuli* or small-grained, and *nihsuki* or beardless' and says that the first came from the west and the second was indigenous to India. Watt draws attention to the remarkable fact that European writers do not refer to the Indian wheat except occasionally. Fryer (1673) and Terry (1655) refer eloquently to the excellent quality of the Dakkan and Gujerat wheat. We have reasons to believe from Hawkins that a European type of hard wheat was introduced into India in the middle ages, but it is not certain. We may well say that the absence of the pure Dravidian terms for the *busa* or whest bran and *sojji* for the common preparation in every household are indicative of the fact that it is North Indian.

Dal (tuvarai) (Red gram [1]).

Next to rice *dal* plays a conspicuous part in the South Indian's dietary. It is prepared from the *tuvarai* or red gram, the pigeon-pea of English, the *Adhaki* or *Tuvari* of Sanskrit, the *tura* of Mahratti, the *tuvvar* of Hindi, the *togari* of Kanarese and the *tumara* of Malayalam and *tuvarai* of Tamil. The Telugu and Uriyah *kandi* seems to be a corruption of the other Sanskrit word *adhaki*. As regards the origin of this grain, the opinion has been expressed that it was not indigenous to India. As it has been found in very wild forms in Africa and Cochin-China, it is presumed that it was introduced from either of these regions into India. If this

1. The word *gram*, it may be pointed out, is the Portuguese mutilation of *grain*, which in its turn is the same as the word *dhanya*. The Portuguese used the word *gram* to a number of commodities, thus causing a lot of confusion. "It has been repeatedly pointed out," says Watt, "that a line drawn from Bombay to Patna will approximately divide India into two sections, the northern being the great wheat land and the southern in which gram is a very subordinate crop." (P. 297)

were the case, the grain must have been introduced in a very early period. This is proved by the fact that it is one of the traditional *navadhanyas*. The term *adhaka*, which is used for purposes of weight from Vedic times downward, seems to be quite different from the [1]grain. Tamil literature, it may be pointed out, uses *adakam* (அடக்கம்) as synonymous with *tuvarai*. [2].

Payar (green gram).

This grain which is largely used in the preparation of cakes and delicacies in South India seems to have been derived from the latter part of the term *mudgaparni* which occurs in Sanskrit. Apparently *parni* has transformed itself into the *payar* of Tamil, [3] the *heraru* of Kanarese and *pesaru* of Telugu, while the former part of the Sanskrit term is in vogue in Mahratti, Konkanese, Hindi, Uriyah and even in Sinhalese in mutilated forms. The varieties of this pulse and the universal prevalence of the same name indicate its popularity from early antiquity. It is also one of the *navadhanyas*. Sir George Watt regards it as indigenous to India; for it is met both as wild and cultivated throughout the plains and up to an altitude of 6000 feet in N. W. Himalaya.

Kadalai (Bengal or common gram).

This is the Sanskrit *chanaka* or *chenuka* which almost entirely was adopted by Telugu and which has been transmuted to *kadalai* and other allied forms in Tamil, Malayalam, Kanarese and Sinhalese. *Chanaka* seems to be the same as the Latin *cicer*, from which the European names have been derived. It was a common article of food for the poorer Greeks and Romans and we have to infer, from the mention of the commodity by Greek writers on India, that it might have been exported from India. In India *chanaka* has always been used as the staple food for horses. It is very probable that when the Aryans first came to use it, it was for feeding the horses which were according to almost all scholars, brought by them to India. A wild variety of the pulse occurs from Kumaon to Central Asia and might have become known to the Aryans

1. For a full list of the references to *adhaka* as a measure of weight on the basis of literature see Barnett's *Antiquities of India* pp. 208-10.

2. The terms *Mudirai*, (முதிரை) *kula*, refer in Tamil to dry grains and pulses. Kula-vanigan Sattan of the Sangam fame dealt in these coinmodities.

3. The first part of *Mudgaparni* might be the *Mudirai* referred to in previous note.

here. Susruta mentions *chanaka* as a dry wholesome food under the name *hari mandakam*. Athanasius Nikitin, the Russian traveller, apparently refers to it as the pea with which horses were fed in the Dakkan in the 15th century A. D. Baber however, curiously enough, does not mention it as such. A vinegar (கடலைப்புளிப்பு) made from *chanaka* is a very early Indian medicine. Discovered by Dr. Hove in Gujerat in 1787, it has become an important item in European diet and medicine. Chanaka, it may be pointed out, also figures (points out Watt) in the puranas though not in the Institutes of Manu. It is referred to in the *Chudamani-nigantu* both as *kadalai* and as *manjura*, derived respectively from the Sanskrit *chanaka* and (probably) *mandaka*.

Ulundu (masha, black gram).

The black gram which is known in Sanskrit as *masha* and in the various languages of India under the allied names of *udida* (Mahratti), *udidu* (Konkanese), *urud* (Hindustani), *uddu* (Kanarese), *minumulu* (Telugu), *uzunnu* (Malayalam) and *ulundu* (Tamil), is, though recognized by the Aryans as one of the *navadhanyas*, certainly, to judge from the universality of the non-Sanskritic name, a non-Aryan pulse originally. The Sanskrit name seems to have been derived from the fact that the seed was used for weight (*ma*, to measure). *Masha* has played a very important part in the rituals,[1] the food and the commerce of India. In fact, Sir George Watt calls it "the most esteemed of the pulses in India both in diet and medicine." The *Chudamani-nigantu* uses the expression *ulundu* as well as *mada* to denote the commodity, both of them possessing philological interest.

Kollu (horse-gram).

The Madras horse-gram which is one of the *navadhanyas* is known as *kulattha* in Sanskrit, with which the vernacular names *kulita*, *kulitu*, *kulti*, *kurulugida*, *kudu*, *uluva* and *kollu* in the different parts of India from the Himalayas to Ceylon are connected. Sir George Watt mentions twenty verieties of this pulse, six of which are natives of India. "That this cultivated pulse should be regarded as the native of India is abundantly confirmed by the existence of a Sanskrit name *kulattha* from which no doubt many of

1. For all the references to *masha* as weight see Barnet's *Antiquities*, Chap. 7,

the vernaculars have been derived." It is very probable that a wild variety of this pulse was first used by the Aryans as food for their horses—a system in vogue even in the present day. It may be remarked that in Tamil the article has got three names, namely, *kanam*, *kulattham*, and *kollu*.

Cholam (millet). 2

This poor man's food is known as yavanala in Sanskrit, from which we have to infer the exotic origin of the pulse in India. One theory is that it was originally got from Java, but the more probable one is that it was obtained from Africa, where it is indigenous, through Arab merchants (hence the name Mecca-cholam). The vernacular terms *jolu*, *jorna*, *Javari* (Mahratti), *cholam*, etc. clearly indicate the Arabian or African origin of the commodity though there might have been an indigenous variety of it in the country itself. In any case, when the grain naturalised itself in India it became so common that it was dubbed the lazy man's grain and Indian corn, Indian millet, great millet, etc. Sir George Watt refers to the derivation of the European *sorgho* by Pliny from the Indian *surgo* to rise as the crop towers above all others! But this is not now accepted Watt draws attention to the fact that mediaeval European writers do not, anamolously enough, refer to this important article. On the other hand, he noted, Abul Fazl mentions it as one of the staple products of Gujerat, Kandish, etc. The silence of European travellers must be due to the fact that they were chiefly acquainted with Malabar, and Malabar has never taken kindly to it. "Koernicke, who maintains with De Candolle, that as a cultivated plant it originated in Africa, not India, observes that it probably reached Asia by sea and not by land routes, as was often the case. But if that were so, we might expect to find it most extensively cultivated near the coast, whereas when we first learn definitely about it in India, it is the staple food of the people who occupy the interior and drier table-lands, not the warm, moist regions near the sea. It is in fact met with approximately in regions where its presumed wild stock *sorghum halepense* is most plentiful. We may, therefore

2. Dr. Macleane points out that it is "the heed of St. Mathew and its spi[illegible] lets the hyssop of St. John." The commodity has a bewildering variety of na[illegible] In Tamil *nigantu* it is called not only *cholam* and *sonnal* but also *irungu* (இரு[illegible]reek One of the singular names indicating foreign origin is *Guinea Wheat*.

conclude that in all probability the Sanskrit people first learned of this grain in India, but gave themselves very little concern regarding it. Everything, however, points to its having been cultivated in the peninsula from remote antiquity, and in all probability many of the races of the plant presently met with in that country have been locally originated." (Commercial Products, p. 1032-33.)

Varahu.

One of the millets of a coarse character used by the people is *varahu*, well-known among the poorest classes. It seems to have been derived from the post-Rig Vedic *priyangu*. Sir George Watt says: "This grass is supposed to have been introduced from Egypt or Arabia. It is grown in various parts of the country up to 10,000 feet on the Himalaya, but nowhere to any great extent." He refers to the discovery of this plant in ancient Khotan (3rd century A.). We have to infer from the identity of names in Sanskrit, Kanarese, Tulu. Telugu and Tamil that the Aryans probably became acquainted with it after they advanced into Hindustan. At the same time, as the commodity is sometimes known as China millet in North India, it suggests introduction from China. The discovery of the article at ancient Khotan might be given as a possible corroboration of this. Whatever might have been the case, the cultivation of the grass became so common in India as to give rise, as has been already said, to the name *common millet.*

Kambu (*bajra*).

Another type of millet is *Bajrah*, also called the spiked or bul-rush millet. Known very commonly in the Tamil country as *Kambu*, which might have been connected with the Sanskrit *kangu*, this commodity is known as *sajje* or *sajja* in the Telugu-Kanarese area, as *bajra* in Mahratti and Hindustani areas, and by other bewildering names in other languages. The Tamil *nigantu* calls it *sen-tinai* செந்தினை and *kavalai* கவலை the latter of which seems to be connected with *bajra*. From the fact that next to *cholam*, this millet is the most commonly cultivated in the south, we have n... six o... be rega... surmise, though hesitatingly, that it was the earliest to be cul-...stence ...ed there. Sir George laconically remarks that it is probably ...or all ...an origin.

Tinai (German millet).

As regards *tinai*, varieties of which are called Italian and German millets, the names prevailing in the different parts of the country are so various that they baffle all attempts to trace a single source. It is rather difficult to see the connections between *kangu* (by which name it is known in Sanskrit, Hindi, Tamil, and Uriyah), the *vari* and *varayi* of Mahratti and Konkanese, the *navane* of Kanarese and Telugu, and *tanahal* and *tinai* of Sinhalese and Tamil. [1] Sir George Watt says: "This millet is extensively grown in India both on the plains and the hills up to 5000 feet and is distributed in the most warm, temperate, and tropical countries. It is interesting, for example, that the discoveries made at ancient Khotan, by recent explorers, show that it was cultivated in Eastern Turkistan during at least the third century of our era. Stein, for example, calls it *tarigh* and mentions specimens of the grain found at Niya and also at Kara-dong which had been identified at Kew." Watt notes, however, that the Bower Mss. discovered at Kucha do not mention it, though they refer to *Samai* and *Ragi*. "The Italian millet has often been claimed as an Indian wild plant, but the majority of writers now regard it as an exotic, though cultivated from ancient times. It has in fact been grown from time immemorial in Asia, and has been recognized in the deposits of the Swiss lake dwellings. De Candolle thinks that the species existed thousands of years ago in China, Japan, and the Indian Archipelago. The Kangni of modern writers undoubtedly denotes this grass, and it is cultivated here and there all over India and even in Burma and the Shan and the Kachin hills."

Samai.

As regards *samai* (சாமை) otherwise called *little millet* and *sanwa millet*, it seems to have been known throughout India by its Sanskrit name *Syamaka* (with slight local phonetic variations); but it is difficult to say on this account that it was an Aryan discovery. Curiously enough, however, I do not find it mentioned in the *Chintamani-nigantu*. It is cultivated in the rainy season all over India up to the height of 6,500 feet, as Watt points out. The gruel made of *syamaka* is referred to in the Bower Mss. (8th ...

1. The Tamil *nigantu* calls varieties of *Tinai* by the names ...ரகு, ...reek ...மடி and கங்கு.

century), thus indicating the prevalence of the article in Western China. As the quickest-growing of the millets, it is peculiarly the poor man's crop.

Ragi.

As regards *ragi* it has always been one of the most common food products of India. Two-thirds of it grow in South India and of this the lion's share belongs to Mysore State. It is therefore a general Indian product, but peculiarly South Indian and Kanarese. It is however distributed throughout the tropical regions of the old world. It was lately introduced into the tropical regions of the New World. It is called *Rajika* or *ragi* in Sanskrit, *kelvaragu* (கேழ்வரகு) in Tamil, *nachani* in Telugu, and by other names in other languages. This variety of names is perhaps an indication of its independent cultivation in different areas from the earliest times. It has been suggested that even the aboriginal peoples would have known it. The crop is mentioned in the Bower Mss. "There is perhaps little or no doubt," says Watt, "that as a cultivated crop this originated in India. There are at all events three or four allied species regularly resorted to as articles of food in times of scarcity and famine. And moreover of the cultivated plant there are in India several fairly distinct forms which almost of necessity denote antiquity of cultivation." Ragi has always been so much wanted by the common people that it has not figured in foreign trade.

The Masura (Maisur-paruppu) (lentil).

This valuable pulse called *Maisur-paruppu* in Tamil and *Chinna-senaka* or little Bengal gram in Telugu, occurs for the first time in post-vedic literature under the name of *masura.*

It is from this that the Tamil name has arisen, the reference to Mysore being apparently incorrect. Sir George Watt describes this as follows:—"A valuable pulse grown as a winter crop all over India. According to De Candolle it is a native of western temperate Asia, Greece and Italy, and has long been cultivated in Egypt, whence it was conveyed to India. As an article of food it has been known from the most ancient times. At the present day, the lentil is cultivated in all parts of India, especially in the Central Provinces, Madras and the United Provinces." The same writer goes on to observe: "In India it is eaten as *dal*, flavoured with various

aromatics and condiments, also as a component part of the dish called *kichri*, and is considered the most nutricious of the pulses. The young pod is also eaten as a vegetable, and the dry leaves and stalks are greatly prized as fodder. In Europe this pulse meal, mixed with barley flour or other cereal and common salt, is sold as an invalid food under the name of *ervalenta* or *Revalenta*." (Commercial Products, p. 709). Dr. Macleane points out that the lentil is also called *mangalyaka* or auspicious in Sanskrit. It was familiar to the Greeks and Latins. "It is the lentil of scriptures, of which Esau's pottage was made." He also points out that the *revelenta arabica* is merely lentil flour.

The karamani (cow-gram).

Sir George Watt points out that the name of this well-known pulse should be cow-pea instead of cow gram. The Sanskrit name of this is *lobhiya* (alluring), from which the Greeks apparently derived the word *lableb*. The cow-pea is a herb cultivated in the hotter parts of India. The *Ain-i-Akbari* refers to it apparently as an autumn crop. There are two varieties of it, one of which is sold as a rival to the French beans. The grain is eaten as flour or *dal*; when green, it is used as a vegetable. Sir George Watt gives 17 different names for the article in the different languages. (See p. 1107). Dr. Macleane gives an even more elaborate note (See Vol III of the *Madras Manual*, p. 328-9). It is enough for our purpose to observe that the pulse is known as *nishpava* in Sanskrit, *chavala* in Mahratti and *alasanda* in Kanarese and Telugu areas. Dr. Macleane derives the name *karamani* from the fact that it was a black grain used for cows (*kar-a-mani*). The other names of the article are country beans, field pulse, asparagus bean, etc.

Mochchai (lablab).

This plant which is known in Sanskrit as *simbika*, from which the Tamil *mochchai* seems to have been derived, is also known throughout India by various names as *avare, alasanda, lablab*, etc. There are numerous other names. It is the general opinion of scholars that it is indigenous to India. It is found both wild and cultivated throughout India. Watt quotes De Candolle to show that the commodity dates from 3000 B. C. at least but no trace of its cultivation is found in China, Western Asia or Egypt, from which we have to infer that it was first cultivated in India. The Greek

name *lablab* was adopted by the Arab physicians of the 9th century and then popularised in Europe from the 15th century onward. In the present day it is grown "all over India more or less, but is comparatively rare in Northern India, becomes abundant in Central, Western and Southern India, and is extended through Bengal and Assam to Burma" It is grown like a green vegetable and also as a fodder crop. The ripe pulse is eaten by certain classes or employed as cattle food. When green, it is used as vegetable like French beans. Dr. Macleane refers to the fact that it is not palatable but cheap, reckoned wholesome and patronised by the poorer classes and cattle!

Sago.

One other article of food may be referred to here, namely, sago. It is an exotic introduced into India from the East Indies, Malaya, Java, etc., where it is indigenous, though it is now commonly cultivated and is even wild in the forest of Burma and Assam. Sago seems to have been taken to Europe for the first time in the time of Marco Polo in the close of the 14th century.

The Navadhanyas.

It would have been inferred from what has been said that certain of the food grains and pulses form the *Navadhanyas*. These grains have been so called because they form the grains offered to the nine planets for securing their favours or blessings on human experiences. The following table represents the articles sacred to each :—

Grains or pulses etc.	Planets.
1. Wheat	The Sun.
2. Paddy	The Moon.
3. Dholl (tuvarai)	Mars (Kujan).
4. Payaru (green gram)	Mercury (Budha).
5. Kadalai (Bengal gram)	Jupiter (Brihaspati).
6. Avara (country beans)	Venus (Sukra).
7. Tila (Sesamum)	Saturn (Sani).
8. Ulundu (Black gram)	Rahu.
9. Kollu (Horse gram)	Ketu.

Of the above sesamum is dealt with elsewhere. It is obvious from the above list that none of the millets are included in the *Navadhanyas*—neither the eommon millet (*varagu*), nor the German millet (*tinai*) ; nor the great or guinea corn millet (*cholam*) ; nor the horse-tail millet (*samai.*) Similarly Ragi is ignored. Why these have been excluded is a theme for speculation.

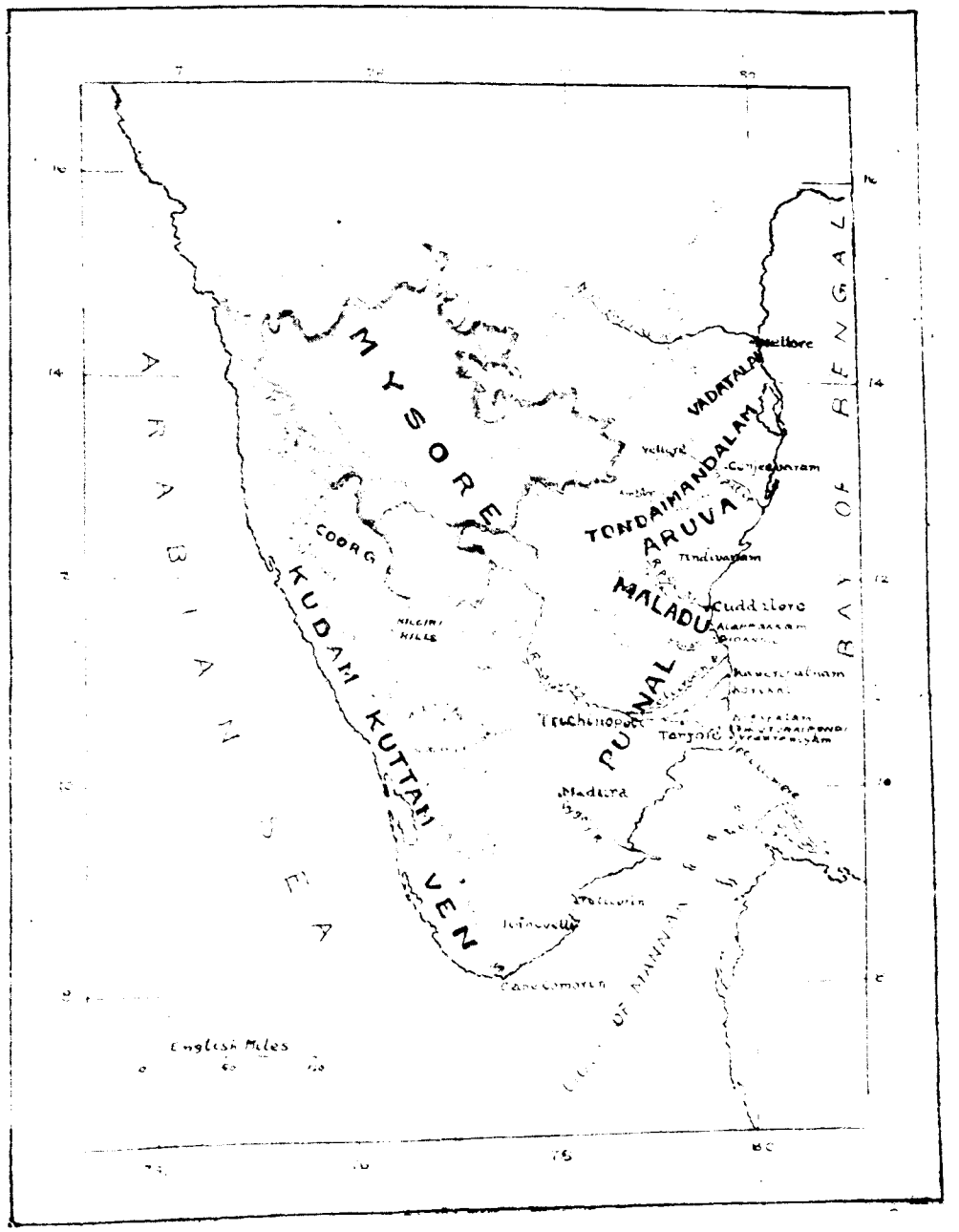
In the Vedic period the earliest grains to be cultivated were barley and wheat. The term *yava* seems to have been applied indiscriminately to either of these grains. The word *dhanya* also was applied in Vedic times to fried barley, but when the Aryans became acquainted with rice (or *vrihi*) on a large scale, it came to be known by that name. The Rig Veda mentions, besides *yava* and *dhanya*, special food preparations like *pakti* (cake, from *pach*, to cook) to which the Dravidian term *pattu* is allied ; *purodasa*, *apupa* and *karambha*, all of which were popularised in the south too. The food-grains were gratefully offered in the earliest periods of the Rig Veda by a husband and wife jointly as offerings to Gods and ancestors for (1) going to heaven, (2) freedom from the necessity to go in quest of food, (3) longevity, (4) health and strength, and (5) the blessings of progeny.

When the Aryans proceeded further and further into Aryavarta, they became acquainted with new grains, pulses, etc. The *Brihadaranyakopanishad*, for example, refers not only to the two grains figuring in the Rig Veda in a more definite manner under more distinctive names (like *yava* for barley and *godhuma* for wheat), but to fresh grains and pulses like rice (*vrihi*), *anupriyanguvas*, *masuras*, *khalvas*, *khalakulas*, *tila* and *mashas*. Of these *anu* is millet; *priyanguva* is some type of *panicum* like *varagu*, *samai* or *kulki*, all of which have been already described. The *masuras* refer to the lentil known as Maisur-paruppu in Tamil. The *khalvas* are pulses ; the *khalakulas* are country beans ; and *mashas* are black gram and its varieties. The White Yjdur Veda refers to *mudga*, *nivara*, and *syamaka*. It is clear from this that, during the centuries which elapsed during the Aryan progress in Hindustan, the exploitation of the country, agricultural and commercial, became very common. The rituals which had to be performed by the Aryan every moment of his life and every experience in his life necessitated the employment of grain offerings which are described in detail in contemporary literature.

It is quite possible to make a full survey of the references to food-grains, pulses, etc., in the subsequent literatures of India, early and mediaeval, Sanskrit and vernacular. Want of space makes such an attempt impossible. What is said is enough to show that the vast majority of the Indian food-grains are very ancient and indigenous.

V. RANGACHARYA.

[*To be continued.*]



A map of South India showing Tondaimandalam and the neighbouring lands.

Origin and Geographical position of Tondaimandalam.

Madras, Chingleput and part of South and North Arcot districts are called even now by a common name Tondaimandalam. Till now nobody has tried to find out the origin of the name Tondaimandalam, its geographical position and the divisions within it. A stray stanza attributed to Auvai and also to Kamban gives the boundary of this tract as follows :—Tondaimandalam is bounded on the north by the Vengada hill, on the east by the sea, on the south by the Pinaki (ni) and on the west by the Pavalamalais.

Geographical divisions on a linguistic basis.

Before proceeding to trace the origin of Tondaimandalam, we shall see how the Tamilagam was divided early. It is a known fact that Tamil is the principal language of the Tamils whose habitat is recorded to be below the Vengada hill. Though the language of these people was called by a common name Tamil, yet this language was classified into many dialects. First it was classified into two main divisions as *Sen Tamil* and *Kodum Tamil* and of the latter there were 12 different kinds. And thus the whole Tamil speaking world was divided into thirteen portions as Sen-Tamil nadu, Tenpandi, Kuttam, Kudam, Karka Ven, Puli, Panri. Aruva, Aruvavadatalai, Ceedam, Malanadu, and Punal Nadu. [1]

Sen Tamil Nadu was taken to be the land of the three Sangams—the Madura country [2]. Senavarayar, one of the Scholiasts on the Tolkappiam, the earliest Tamil grammar now extant—writes that 12 Kodum Tamil Nadus extended from the south-east of Madura to the north-east.[3] There is no difference of opinion amongst the exponents [4] of the Tamil nadus in identifying Tenpandi with the present Tinnevelly Dt: Kuttanad with Travancore, Kudanad west of it and Ven between Tenpandi and Kuttanad, Malanad with Malayaman's territory with Tirukkoilur as capital and Punal Nadu

1. நன்னூல் மயிலைசீநாதர் உரை சூ 272.
2. The Tamils 1800 years ago P. 12.
3. தொல்-சொல் சேனாவரையர்உரை 97.
4. The earliest is V. Kanakasabhi. The latest is V. Rangachary of the Presidency College vide Journal of Geo. Asso Vol. III No. 2.

with the Cauvery delta. Kanakasabhai Pillai says that Aruva and Aruvavadatalai were together known as Mavilankai or the great Lanka and the capital of this province was Kacchi or Kanchipuram though he did not give any proofs to support his opinion [5] .V. Rangachari of the Presidency College, Madras says that ' Aruva southern and northern was respectively the area now covered by the Chingleput and North-Arcot districts, [6] though the name southern Aruva does not occur in Tamil literature. P. T. S. Iyengar says in his *History of the Tamils* that the district of Kanchipura had in early times no specific name like the other eleven Tamil Districts but was merely called Aruvavadatalai, the region lying north of Aruva, which was what is now called South Arcot. It was in later times *i.e.*, long after the Pallava dynasty had established itself finally there and the district became a centre of Tamil culture that it came to be called by the specific name of Tondaimandalam, literally the district ruled over by the kings or the people, named after the creeper Tondai [7]. We shall discuss about these points later on. Further Kanakasabhai identifies Ceedam with the Nilghiris, as ceedam denotes cold ; Puli with the northern portion of the West Coast and Karka with east Travancore [7] V. Rangachari is also of the same opinion, but while Kanakasabhai identifies Panri nadu with the modern Negapatam and Tiruturaipundi Taluks of the Tanjore District, with Negapatam as its capital. [8] Rangachari differs from him and is of opinion that it was the District North-West of Madura.[9] The sources on which these statements are based are not given. Ceedam, Puli, Panri, and Karka are the nadus that cannot be identified satisfactorily at present in our opinion.

Aruva and Aruvavadatalai.

That the position of Aruva and Aruvavadatalai is located differently by different authors has been noted above. Aruva nadu cannot be equated with the present South Arcot district wholly for the simple reason that Miladu or Malayamanadu comprised portion of South Arcot, with Koval-now called Tirukkoilur-as

5. The Tamils 1800 years ago P. 27.
6. Madras Geo Associ Journal Vol. III P. 50.
7 A. P. 323.
7 The Tamils 1800 years ago p. 15.
8 The Tamils 1800 years ago, p. 24 and map facing page 22.
9 Madras Geographical Association Journal Vol. iii p. 50.

capital between the rivers Vellar and Pennaiyar. Hence Aruva has to be placed above this Miladu. As to the identification of Mavilankai with Aruva and Aruvavadatalai nadus by Kanakasabhai with Kacci or Kanchi as its capital[10], all that we have to say is that the work in which Mavilankai is first mentioned—the one on which he bases his statement—does not say that it is a province. What we find in the *Sirupanarruppadai* is that Nalliyakkodar is a descendant of the kings of Mavilankai[11] ' which bears the same name as that of the great Lanka which is surrounded by water.

The same idea is conveyed in Puram 176 also [12]. These clearly indicate it to be a town or city. The word Lanka in Telugu gives one the idea that it should be an island or padugai surrounded almost by water. This we cannot find anywhere in South India except in a deltaic portion. The Cauvery delta is out of question here as this belonged to the Cholas [13]. The natural river basin or Doab between the Vellar and the Pennaiyar belonged to Malayaman as already mentioned. We cannot conceive the doab lying between the Pennayar and the Palar as *lanka* much less a town. Where then can we locate Mavilankai ? Have we any materials for it ? Let us try. Kidangil (L 160) [14] now a village South of Alappakkam Railway Station, Velur [15] (L 173)—the present Vellore-and Amur [16] (L 188)—Ambur of the present day are all placed north of Mavilanaki in the *Sirupanarruppadai*. Then it comes to this that we should try to find it some where south of Kidangil. It has been stated above that the word *Lanka* conveys the idea of a narrow and small strip of land surrounded by rivers. Such a place we find near Cuddalore. The river Gadilam runs close to Cuddalore and the Pennaiyar runs a little north of it and falls into the sea. Perhaps the people might have thought that the one is the branch of the

10. The Tamils 1800 years ago p. 27.
11. நறவி நாகமு மகிலு மாரமுஞ்
சுறையொடு மலிர்க்குந் தோட்புணை யாகிய
பொருபுன றரூஉம் போக்கரு மரபிற்
றொன்மா விலங்கைக் கருவொடு பெயரிய
நன்மா விலங்கை மன்னருள். 116-120
12. இழுமென வொலிக்கும் புனலம் புதவிற் பெருமா விலங்கை
13. புனல் நாடு.
14. இனமலர்ப் படப்பைக்கிடங்கிற் கோமான்
15. வீறல் வேல் வென்றி வேளூர்
16. அந்தண்கிடங்கினளூர்

other by the close proximity of both and might have taken it to be a Lanka formed by the two rivers. We cannot say anything positively at this distance of time. The mention of three several towns in *Sirupanarruppadai* perhaps made Kanakasabhai Pillai think of an Empire of Mavilankai with Kacchi as capital. But then Mavilankai was not Kanchipuram and with all these materials about Nalliyakkodan we are on firmer ground when we say that this ode arose only after Ilantirayan. To put it more plainly it is only after the country received the name of Tondainadu, as we read in the ode itself, that this Nalliyakkodan lived after the seven patrons paid their debt of nature [17]. From the foregoing explanation we are led to the conclusion that there is no evidence to connect Mavilankai either with Kanchi or Aruvavadatalai [18].

In the *Pattinappalai*—one of the ten idylls—it is stated that Karikalvalavan subdued the Oliyas, Aruvalas and Aruvavadatalai people[19] Who were these Oliyas? Where did they live? Nacchinarkkiniyar says that the Oliyas are Vellalas who are entitled to become kings of other territories.[20] Kanakasabhai says that the ' Oliyar were another tribe of Nagas, who, it is said, were conquered by Karikal Chola. We find them in power so late as the 11th century A. D. from an inscription at Mamallapuram. This inscripation is dated in the ninth year of the Chola king ko Parakesarivarman Udayar Sri Rajendra Deva who defeated Ahavamalla, the western Chalukya king at the battle of Koppai. It is the copy of a deed by which a piece of land was granted to the Varahaswami temple at Mamallapuram and which was signed by the following Nagas amongst other high officers of the Chola king:— Olinagan Mathaiyan Alagia Cholan, Amur Nadu muvendavelan ; Olinagan Chandrasekaran ; Olinagan Narayanan.[21] Nalliyakkodan

17. எழுசமம் கடந்த எழுவுறழ் திணிதோள்
எழுவர் பூண்டவீகைச் செந்துகம்
விரிகடல் வேலி வியலகம் விளங்க
வொருதான்குங்கிய 112-115
18. G.A.J. III, 71. and the Tamils 1800 years ago P. 127.
19. பல்லொளியர் பணிபொடுங்கத் தொல்லருவாளர் தொழில் கேட்ப
வடவர் வாட 274-276
20. ஒளியராவார் மற்றை மண்டலத்திற்கு
அரசாதற்குரியராவார். 274 அடி உரை
21. The Tamils pp. 43 and 44.

is said to belong to Ovia sect[22] in the Sirupanarruppadai. He is said to belong to Oyma Nadu which name has filtered down as far as the 10th and 11th century even.[23] Kanakasabhai says that Oviyar were most probably the Basore Nagas alluded to by Ptolemy as kings of Melangai. He further says that they were a family of the Aruvalar tribe.[24] If Oviyar and Oliyar belong to the same tribe, then Aruvanadu has to be located near Tindivanam and Kidangil the capital of Oyma Nadu.

Some glimpses of Aruva Nadu.

Another important factor which goes to confirm the above statement is the mention of Aruvanadu in some copper plate grants of the first half of the 8th century. The Bahur plates state that Bahur belongs to the Eastern portion of Aruvanadu.[25] The Tandantottam plates state that Tamanallur and Aruvakkur are in Aruva Nadu. [26]

Tiruvamathur is said to be in Vavalur Nadu which is in the western road of Aruva.[27] From these small scraps of evidence we have to infer that the country had two high roads, one eastern and the other western. As said above Tiruvamattur is in the western road and Bahur is in the eastern road north of Pennar and near the sea. Tamanallur and Aruvakkur are villages in the same District. These identifications go to confirm that Aruva Nadu comprised the country lying between the Pennar and the Palar even during the time of the Pallavas.

As to the location of the Aruvavadatalai, we know that the Tamil land extended as far as Nellore, and a line drawn from Tiruvenkadam through Nellore to the sea will be the northern boundary of Aruvavadatalai. We are not able to draw the southern boundary of this land at present with any precision and may assume the natural boundary of Palar. Thus we are able to identify

22. ஓவியர் பெருமகன்
23. தொண்டைநாடான ஜயங்கொண்டசோழமண்டலத்து ஒய்மா நாட்டுப் போராயூர் நாட்டு S. I. I. ii 425.
ii இம்மண்டலத்து ஒய்மாநாட்டுப் போராயூர் நாட்டு நகரம். v 387
24. The Tamils 1800 years. ago p. 44.
25. காடுவெட்டித் தமிழப் பேரரையன் ஆணத்தியாக அருவாநாட்டுக் கீழவழி வாகூர்நாட்டு நாட்டார் காண்க. S. I. I. ii p. 516
26. அருவா நாட்டு அருவாக்கூர் ; அருவா நாட்டு தாமரல்லூர் S. I. I. ii p. 518.
27. அருவாநாட்டு மீவழி வாவலூர் நாட்டு தேவதானம் திருவாமாத்தூர் iii p. 228.

Aruva, Aruvavadatalai. In all these digressions and discussions we do not see the name of Tondai Nadu—the primary object of this paper. Now we shall try whether we can get any materials from the Sangum works themselves. In one of the ten idylls—Perumbanarruppadai—the hero of the poem Ilantirayan is said to be the Lord of Tondayar. He is said to be a descendant of the Cholas of the solar race belonging to the branch of Tirayars [28]. This is the first reference we have of Tondainadu if we assume that the Lord of Tondayar will convey the idea of Tondainadu also. His capital is said to be Kacci. In the *Pattinappalai* and *Porunararruppadai*—two of the odes on Karikal in the *Ten Idylls*—no mention is made of Tondainadu. The authorship of *Pattinappalai* and *Perumbanarruppadai* is attributed to one and the same person. If so the author cannot have forgotten to mention the relationship if there were any. Apart from this fact, it is certain that the name of Tondainadu should have been given only after Karikal and before Ilantirayan. The Sangam works do not help us to find out who this Ilantirayan is as already stated. In the Telugu inscriptions [29] we read that Karikal had a son named Mahimanachoda. He had three sons Karikala, Tondaimana and Dasavarina. If this can be relied on, then, Thondainadu should have been named from this Thondaimana. On the other hand we read that Karikal had 2 sons Nallamkilli and Killivalavan. This Killivalavan married a Naga princess and had a son [30]. In the *Perumbanarruppadai* itself the author says that Ilantirayan belonged to the Chola family and is a descendant of the Tirayars, perhaps on the mother's side. If the foregoing statements can be reconciled to a certain extent at least, then, we may safely trace the foundation of Tondainad to the descendants of Karaikal.

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28. The Commentator Nacchinarkkiniyar says that the Chola of Negapatam married a naga princess and when she asked him to provide for her son, it is stated that he promised to give this son sovereignty over his kingdom if the boy is sent to him with the creeper Tondai. Kamakasabhai takes Tirayars to be Tamil invaders from Lower Bengal. Tirayar is equated with Sagarakula in samskrit. The ancient kings of Tondainad belonged to the Sagarakula. A king called Tirayan was contemporary of Karikal chola. Families of Tirayar tribe are to be foundin Tondaimandalam as late as the sixteenth century. Pangala Thirayar, China Thirayar, Kadara Thirayar, Singala Thirayar and Pallava Thirayar are some of them (Extracts from p. 47 & 48). We find Vangatharayar, Sinatharayar and others in the inscriptions. They are titles bestowed on the generals who took Bengal, China, Burmah and other places. There is no warrant to hold that they are the descendants of Tirayars. For a detailed study see *Tamils 1800 years ago* p. p. 47 and 48.

29 Epigraphists report for 1900 page 17.

30. Mammekhalai.

30. AS. I. I. iii p. 276.

Divisions of Tondainad.

Now we have traced the origin of the Tondainadu we shall try to find out whether there were any divisions within it. The boundaries as stated in a poem of a later date is given in the opening paragraph of this paper. In a poem of the 18th century it is stated that Tondainadu was divided into [24] Kottams. Though there is no recorded evidence to show that the country was divided into 24 divisions in the early literature, we find mention of Kottams in Inscriptions and copper plate grants of the Pallavas. E. G. Kalathur Kottam [31] is mentioned in an inscription of Narasimhavarman I (C. 646-660 A. D.) Nirvelur Nadu of Urrukkattukottam is mentioned in Kuram plates [32] which was issued during the reign of Paramesvaravarman I (C. 674). Alinginapakkam of Urrukkattu Kottam, Miyaru Nadu in Paduvur Kottam [33], Tirukkattuppalli a village in Nayaru Nadu in Pulal kottam are mentioned in the grants of Ko-Vijia Nandi Vikrama Varman. We may trace many other Nadus and Kottams if be just take the trouble to look to it. The *Tondaimandala Padiyam* states the severai Kottams and Nadus as follows :—

1. Pulal. Nayaru, Ahuthi, Othur, Elumur.
2. Puliyur. Kunrathur, Porur, Mangadu, Amarur, Kottur.
3. Ekkadu. Kakkalur, Kacci.
4. Manavur. Pasalai, Elathur, Konnur, Purisai, Peramur.
5. Chengadu. Ponnalur, Attikarattur.
6. Payyur. Virpati, Chevur, Vengal.
7. Eyil. Thandakam, Maharal, Koveri.
8. Thamal. Karuvidu, Vadakarai—Valli Nadu.
9. Urrukkadu. Palaiyur, Thamalur, Kunnam, Nirvelur.
10. Kalathur. Kurumbarai, Vallipuram, Puttur, Nadunadu.
11. Sembur. Peraiyur, Pattinam, Mukanthur.
12. Amur. Kumili, Paluvur.
13. Ettur. Aram, Oranganadu.
14. Venkunram. Perunahar, Arasur, Marutanadu, Nellore. Tellaru.

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31. S. I. I. i p. 150.
32. Ibid iii p. 91.
33. ,, p. 93.
34. ,, ii p. 509.

15. Palkunram. Pasur, Taccur Miyur, Singamporutavala nadu.
16. Ilankadu. Ponnur, Thennattur, Makulam.
17. Kaliyur. Kaliyur, Pulivanam, Virpedu, Erikil Nadu.
18. Sirukarai. Ainda Nadu.
19. Paduvur. Perumtimiri, Arkadu, Sengunram.
20. Katikai. Perumkanchi, Paranchi, Melkalattur,
21. Sentirukai. Poliyur. Valakulam, Alathur, Arunkullam.
22. Kunrapathiram. Mangalam, Vengalur. Urimayam.
23. Venkadam. Kutlakarai, Pottappi, Thondaman.
24. Velur. Olukarai, Nel Emili Mathur,

Pulal, Puliyur, Ekkadu, Manavur, Chengadu, Eyil, Thamal, Urrukkadu, Kalathur, Amnr, Venkunram, Kaliyur, Sirukarai, Paduvur, Kunrapathuram Kottams with the Nadus figure in the Chola inscriptions.

Sometimes there are a few changes in the names also; *e.g.*, Manavur is called Manavil; Sirukarai, Aindanadu is called Karaivalu Anthinadu. These are some of the changes we find; and a careful study of the inscriptions will result in the correct identification of the Kottams of Tondainadu and thus will enable us to find out the geography of an ancient period.

SOMA SUNDARA DESIKAR.

The Comorin Continent

It has been maintained by several Tamil Scholars that the South India of to-day, tapering as it does to the Cape Comorin, did not exist as such a small peninsula as we find it to-day. They assure that once upon a time, long before the beginnings of recorded history, but still within traditional knowledge, there was a continuous extension of land connecting South Africa and Australia, with India right across the Indian Ocean. These scholars base their conclusions on references found scattered throughout the earliest literature.

It appears that the enroachment of the sea on this extensive continent, referred to as Kadalkollal (கடல்கொள்ளல்) is just mentioned by Nakkirar, while commenting upon Nayanar's *Ahaporul*. Though to-day scholars like Mr. Seshagiri Sastry would not accept his views on the Sanghas, this idea seems to have been strengthened by the repetition of erudite commentators like Nachinarkiniar and Adyarkunallar.

Among indirect references we have various. The geographical limits of Tamilaham are described in Tholkappiam, as Venkatam in the North and Kumari on the South. The latter the theorists infer to be a river from other references and believe that it watered the land which now has sunk into the ocean. In Kalithogai we are told that Pandyan lost a part of his kingdom, through the encroachment of the sea and forthwith seized portions of Chera and Chola Kingdoms; and it is surmised that sea encroachment is due to a subsidence of a part of the Comorin Continent. Nachinarkiniar, commenting on the reference to a *pralaya* (deluge) in Tholkappiam, has pointed out the disappearance of 49 lands covering a total area of 700 *kathams* and proceeded (we do not know on what authority) to detail a list of these 49 lands—the argument is that 700 *kathams* computed by present day tables would be nearly 7,000 miles. This is taken advantage of by others who having read about Prof. Haeckel's Lemuria—the continental connection between Africa and India—reason that as this land covered nearly 7,000 miles, Australia ought to have also been included in this land. As the early anthropologists considered this Lemuria as the "cradle

of humanity", patriotic Tamils began to argue that " if we can believe in the tradition of there having been a vast continent south ol Cape Comorin whence all humanity and civilisation flowed east, west and north, then there can be nothing strange in our regarding the Tamilians as the remnants of a pre-diluvian race." Former theories of the beginnings of man centred round this imaginary land —Lemuria, and therefore it was possible to claim the very doubtful glory of being the natives of a land wherein the human race had evolved, and whence all branches of the human family spread.

Anthropologists and eminent authorities on this still very hazy disputed subject of man's earliest beginnings (Sir Arthur Keith and Macurdy for instance) are of opinion that we cannot say definitely whether it is Central Asia, or Africa, or Europe which witnessed the first human beings. The much commented Pithecanthropus—the apeman of Java—was found to be not at all in the direct line of man's evolution, but a side branch from the stem which later gave rise to men.

Above all it is extremely necessary from the standpoint of science that we have an idea of the time of the earliest appearance of man—rather than the place where he is likely to have had his evolution and this seems to be more or less the only satisfactory result of the arduous researches into the problem of human origin. Scientists, arguing from the chronology of the earliest human remains, computed that man could not have emerged from his animal ancestors, earlier than the Miocene period of geologists, i.e., 350,000 years ago. A brief survey of this period will be of interest. Nearly 10,000 years ago men as a rule used only implements, shaped out of crude stones, and they were not ignorant of pottery—this period is known as the stone age. About 20,000 years back of the Christian Era, there was, if not a deluge, at least covering of the great portions of the earth's surface by fields of ice and men ignorant of pottery and other crafts lived their lives entirely in caves and were notable for their scratching and engraving in the cave walls with their implements. Nearly 40,000 years B.C. there was another Ice age and the men were more or less the same kind. Far earlier than this period, i.e., 120,000 B.C. men lived in much the same way but seemed to have used only naturally formed stones as implements. About 200,000 B.C. there prevailed on the surface of the

globe, the first spread of Ice. This age of stone implements, however, extended back to 350,000 years before Christ. This age was preceded by a whole age during which the ape-like men lived. Beyond this period, the ancestors of apes, gorillas, chimpanzees were the highest creatures and their previous history forms but a single chapter of the volumes of animal history.

All these calculations have been made through the most rigorous searching of science and each single item of the conclusions been accepted only on the corroborations of many lines of evidence, and therefore has a greater mathematical precision than tradition and authority of men like Nakkirar and Nachinarkiniar and others however great they may be in their special fields. The crux of the whole question now lies in the fact that while man did not exist on this earth nearly 350,000 years ago, India has been existing as a small peninsulia even from before that time and it has been perfectly free from any connection with Australia, Africa, or even with any of the islands in the Arabian Sea, and hence a Kumari Kandam in which Tamil was spoken and from which men went out to people Australia, Africa and other places could not have had any more basis of fact than the figments of a poetic imagination.

But India has had connections with Australia and Africa, though these existed far back in the earth's history. Biology will even go further to say that India was connected with South America, through Africa and the land stretching right across the Atlantic! This vast belt of land beginning from Australia, including India covering the Indian Ocean running across Africa and Atlantic, extended up to the South. This is known to Biologists as the Gondwana land. To this land India contributed only by its peninsular portion, while its northern portion including the Punjab and the Himalayas and Tibet were under the sea as also a greater part of middle Asia, Arabia and Sahara. This Sea, called the Sea of Tethys ran right along the northern side of the Gondwana land. This largest Continent existed, according to geologists, in the first and earliest recognisable period of the earth's history and Biologists say that there were then no men, birds, beasts, snakes, lizards, crocodiles, turtles. The Seas swarmed only with fishes, crabs, prawns, snails, worms and various backboneless soft-bodied animals, and frogs and some fishes peopled the rivers. It may be

asked how the biologists and geologists describe the condition of the earth at a time when no man ever lived. They infer the probabilities of such a land connection from the similarities of the present and past animal population of Africa, Australia and South Amercia and their joint difference from the animals of the rest of the world. One piece of such evidence is the significant occurrence in these three land masses, of the three members of the family of mud fishes. These mud fishes live only in freshwater and will die if left in salt or sea-water; and hence they should have evolved from common ancestors and become distributed so widely only if there had been one vast stretch of land.

During the several ages which passed subsequently, i.e., through the next epoch, the sea south of the Gondwana land seems to have spread northward, just south-east of our present Indian boundary, owing to gradual subsidence of the land portion so that we had an India on whose south-eastern side there lay the Bay of Bengal and on whose south there stretched the Indian Ocean. This Bay of Bengal, however, washed many of our at present coastal places; Trichinopoly, probably Madura, and other southern places also were under the sea, as well as several other places in Southern Bengal. Gradually, however, the sea receded owing to the slow elevation of land and the sea has come to form the present coast line. Even within historic times we know that places like Mahabalipuram, have been approached by the sea to a greater extent than, for example, near Madras where the sea seems to recede. During this middle epoch of the Earth's geological history, Ceylon also was under the sea. In short, India was connected with Africa on the western side while its connection with Australia was cut off and the southern and south-eastern boundary was more or less fixed thenceforth.

During the third epoch which again is of several ages, the Sea of Tethys dwindled to a Tibetan Sea, and soon the Himalayas "rose from the azure main," and it is a striking monument of the earth's surface changes which occurred then. The connection with Africa and Madagascar ceased owing to the invasion of sea on the west to form the Arabian Sea and the western outline was thus fixed. With the erection of the Himalayas and the Tibetan plateau the various rivers were formed. The only possible connection with Australia

through Burma and South Eastern Asia was severed from Australia which was thus cut off into an island containing animals. These animals have since that early period progressed in lines quite different from the rest of the animal kingdom so that the kangaroo, the duckbill, the spiny ant-eater and other animals are all its own and found nowhere else. Ceylon was raised from the sea; and India thus can be described to have been born in its present geographic form early in the third epoch of the earth's history. Though soon man-like apes, ape-like men, apes, gorillas, chimpanzees, soon were formed on the earth, it is not till the fourth epoch that we recognise the human kind belonging to the genus Homo. Of this genus, we have had various species—Homo Heidelbergensis and Neanderthalensis have been the earliest species of many. Later came the species Homo Sapiens to which we men with language and handicrafts belong. Of this species we have had types of various cultures belonging to various ages like the stone age, the bronze and iron ages.

When we compare this vast pile of facts and the theories into which they have been woven, our full acceptance of the conclusions of science is a necessity; but still we cannot help wondering how such a widespread idea among several scholars and South Indian antiquarians would have possibly been given birth to and nurtured. Of the direct statements in Tamil Literature there is one and only one and it says that 7,00 *kathams* were taken by the sea and this would give, as pointed out before, according to our present tables 7,000 miles. Such an area would cover Africa and Australia as mapped out by present-day geographers. For all we know their figures may be guess work or their *kathams* much less than our ten-mile and it is too fragile a fact to support such weighty conclusions as dealing with the binding up of whole Africa and Australia to this little South India of ours and to support the theory that all the nations of the south once were inhabitants of this Tamilaham.

C. P. GNANAMUTHU, M. A.

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Report of the Proceedings of the Third Annual Meeting of the Geographical Association.

The Third Annual Meeting of the Association was held at 5-30 P.M. on Saturday the 27th July, 1929, at the Presidency College with Mr. P. T. Srinivasa Ayyangar in the chair.

The Report for the year 1928-29 was read, discussed, and adopted.

The Secretary then explained on behalf of the Working Council *a scheme of starting mofussil branches* in centres where there was a minimum of six members. Its main object was to enable the Association to increase the sphere of its activities by giving scope and opportunity to mofussil members to study their own localities, and thereby contribute to the main work of the Association. A large number of members can thus be made to take active and direct interest in the Association. From the business point of view also it was pointed out that the scheme had great advantages such as corresponding with one local secretary, who could collect and remit the subscriptions, and could receive and distribute circulars, reports, leaflets, etc. A copy of the journal would be given free to every branch—a concession which would be appreciated by the non-journal members of such mofussil centres. An annual conference was also suggested as an eventual possibility. It was further announced that Trichinopoly and Villupuram which had the requisite quota of members had already applied for affiliation as distinct branches. Ths idea of the scheme was approved, and the Working Council was empowered to frame bye-laws and carry it out.

The election of the members of the Working Council for 1929-30 was then taken up, and the following persons were elected to constitute the new council :—

EX-OFFICIO MEMBERS.

President.

M. R. Ry. P. T. Srinivasa Ayyangar Avergal, M.A.,
Reader in Indian History, University of Madras.

Vice-Presidents.

1. Miss E. D. Birdseye, B. Sc., Dip. in Geo. (London),
Lecturer in Geography, St. Christopher Training College, Madras.
2. M. R. Ry. S. Lakshmana Ayyar Avergal, B.A., L.T.,
Fomerly Lecturer in Geography, Teachers' College, Saidapet.

Secretary.

Mr. N. Subrahmanyam, M.A., L.T.,
Lecturer in Geography, Teachers' College, Saidapet.

Treasurer.

Mr. A. Appadorai, M.A , L.T.,
Research Scholar, University of Madras.

Other Members.

1. Mr. M. Subramaniam, B.A., B.L.
Advocate, High Court, Madras, (Editor of the Journal).
2. Mr. A. Swaminatha Iyer, B.A.,
Retired Deputy Collector, and Editor of Rural India.
3. Miss H. A. Edington, Dip. in Geo. (London),
Teacher, Churchpark Training College, Madras.
4. Mr. K. Rangaswami Ayyangar, B.A., L.T.,
Lecturer, St. Joseph's College, Trichinopoly,
(Mofussil Member.)

A resolution was passed expressing grateful thanks to Rao Bahadur M.R.Ry. H. Narayana Rao Avergal for ably discharging the duties of the President of the Association for three years during its formative period.

On the proposal of Mr. K. K. Raghava Charya, the question of finding a permanent accommodation for the Association was discussed, and a building committee, consisting of Messrs K. K. Raghava Charya, K. Jogiah, and N. Subrahmanyam was appointed to collect funds in the first instance.

Mr. Raghavachari also proposed the formation of a library as an urgent necessity for the Association, and suggested as a first step the collection of books from members to form the nucleus of a

library. The Secretary promised to take action along the lines suggested, and stated that he would also arrange the books received for review, etc., and make them available for loan to members.

The last item of the programme—the proposed excursion to Nagalapuram—was discussed; and several members expressed a desire to take part n the excursion, and tentatively gave their names. The secretary was requested to find out the details with regard to conveyance, accommodation, expenses, etc., and circulate to the members a definite scheme with details of programme and expenses before arranging the excursion.

The meeting closed with a vote of thanks to the chair.

Teaching Notes on "The Winds of the Indian Ocean".

I

The new A-group syllabus in Geography under the re-organised S.S.L.C. Scheme has been prepared with great care and thought on a graduated plan; and one of the important features of it, as pointed out in the previous number of the Journal, is the approach each year from an oceanic basin to the study of the lands on its margin. This does not of course mean, as was misunderstood by some people, that Oceanography is included in the syllabus. On the other hand, it is merely intended that topics like winds and currents, which influence the lands on the oceanic margin, which are partly or wholly oceanic in their nature and character, and which are related to each other in the different shorelands of the basin, shall be studied in a wider correlation than merely in connection with the particular lands alone; because, this method of treatment not only affords a natural common approach to the study of those lands but also tends to clearness of understanding by the avoidance of scrappiness, while at the same time economising time.

It is, however, possible to push this last argument too far, and plead for the preliminary study of the World Winds before the particular continents are taken up. As a matter of fact, some teachers have attempted to tackle the Planetary Wind Systems first before taking up the winds of the Indian Ocean. This is to be deprecated as putting the cart before the horse. The study of winds in each of the oceanic basins is simple, definite, and concrete, and ought to precede and lead up to a knowledge of world winds, instead of the other way.

The method to be followed at this stage is mainly the inductive one of first studying from the map the facts regarding the winds—their general directions in the two seasons—, and then proceeding to an explanation of the causes therefor.

II.

The reference is to the two maps of the Indian Ocean, showing pressure conditions and wind directions during the two typical months of January and July respectively.

Examine the general wind directions in the two maps one by one, and then compare them. What remarkable difference do you find between them to the north of the equator ? In which season do you find the equatorial belt of calms, and where exactly ? What is the general direction of the winds north and south of the equator in the same season ? How do the north-easterlies change south of the equator in North Australia ?

Do you find the Belt of Calms in the July map ? How do the south-easterlies change after crossing the equator ? Against what countries do they blow now with this altered direction ?

Compare the westerlies of the Southern Ocean in the two maps. When are they blowing more northerly ? What continents do they touch now ?

(*While the wind directions are thus being read out, the pupils will be directed to mark them in their outline maps.*)

Barring minor differences, therefore, the south-easterly winds blow uniformly throughout the year south of the equator in the Indian Ocean, while north of it the winds blow in opposite directions in the two seasons. The former are known by the name of the *south easterly trades*, because they follow a regular track. Winds which blow in one season only are known by the name of *monsoons*, which means periodical winds. So, we find in the Indian Ocean Basin north of the equator the north-east monsoon in the January map and south-west monsoon in the July map, and south of the equator in North Australia the north-west monsoon in the January map.

III

The subject of "*Winds*" is a difficult one for boys of the fourth form, and it can be fully understood only in a higher class. Still, an attempt may be made to explain in a general way the causes of winds as well as the causes of their change of directions in the two seasons.

Wind is air in motion ; any movement of air takes place only as the result of difference of pressure. For example, air passes from a pump into the tyre of a bicycle or a motor-car because of the greater pressure in the pump than in the tyre. Again, when there is a puncture or when the valve is opened, the air in the tyre which is under high pressure rushes outside where the pressure is less. Even so, in the atmosphere there are areas of high pressure

and areas of low pressure, the differences in pressure being ultimately due to differences of heating.

Examine the January map, and find out where the equatorial belt of calms is in this season ? This is an area of low pressure. Compare it on the Indian Ocean, in Africa and in Australia, and find out where it extends more largely. Can you guess why it should be so ? Where is the sun overhead about this time ?

Examine the July map, and find out where the low pressure area is. Can you guess why it should be so ? Refer to the July isothermal map, and find out the temperature conditions of the same area ? The reason for the shifting of the low pressure area will be clear. But why should the temperature be high here ? Where does the sun shine overhead at this time ? A large land mass and a large water mass are situated side by side here ; and land is heated more quickly and to a higher degree than water. Hence the low pressure area in Southern Asia, which sucks as it were the south-east trades across the equator, and makes them blow as the south-west monsoon in India, Burma and Ceylon.

IV

Let us next try to understand why winds are deflected or change their direction, and become easterly or westerly. When the low pressure is near the equator, you would expect the areas of high pressure in the north and the south to be northerly and southerly respectively. Why should they turn north-easterly or south-easterly ? Similarly, when the low pressure is over North-western India, why should not the winds be purely southerly ? Why should they blow at first from the south-east, and then after crossing the equator from the south-west ? All this change of direction is due to the rotation of the earth. Let us find out how it is so.

Where is the rate of the rotation of the earth highest ? Why ? How do you expect it to change as you proceed north or south ? Why ? Winds moving from a lower to a higher latitude possess the greater velocity of the portion of the earth wherefrom they come. Would you, therefore, expect them to go ahead or to lag behind ? That is, they become westerly, as the south-west monsoon in the northern part of the Indian Ocean, or the north-west monsoon in North Australia. Winds moving from a higher to a lower

latitude possessing only the lesser velocity of the portion of the earth wherefrom they come, lag behind, *i.e.*, become easterly, as the north-east monsoon or the south-east trades. This principle is enunciated in a slightly different form also, and is known as Ferrel's law. If you imagine yourself to be moving in the directio of the wind, in the northern hemisphere it is deflected to the right owing to the rotation of the earth, and in the southern hemisphere it is deflected to the left. Verify this rule in the case of the winds of the Indian Ocean. Later on you will find other examples of the application of this rule in the case of winds in other parts of the world.

V

The main method of treatment of an abstract and difficult subject like the *Winds* to the fourth form pupils has been indicated above. No doubt there will be a difference of opinion as to how far the idea of *pressure* can be introduced at this stage, or as to how much of it can be understood by the pupils. The method is briefly (i) map-reading of the main facts, which is heuristic in character, (ii) map-filling, *i.e.*, noting those facts in the pupils' outline maps, which gives scope for practical work, and (iii) map-correlation, *i.e.*, trying to explain these facts with reference to facts in other related maps, which serves to exercise the reasoning faculty. The procedure in such cases should as far as possible be inductive, and not deductive; and the teacher's motto should be "*facts first and then explanation.*" Abstract and difficult topics like the *Winds* and the *Seasons* are not completely grasped at one stage only; and they should be taught progressively in each of the classes till they are fully understood. The opposite method of trying to teach them deductively by application of principles is doomed to failure.

Reviews

School Atlases

Even more important for the study of Geography than the provision of good text-books is the provision of good school atlases which the pupils can frequently use by themselves; and these, like the text-books, need specially to be prepared for the country in which they are to be used. Formerly, atlases prepared for use in English schools with a number of special maps of British Isles and he various European countries with only one or two maps of India

were the only available ones for use in our country also. Luckily, things have now changed; and we are glad to be able to review below a few atlases specially prepared for use by Indian pupils.

The Indian School Atlas. By John Bartholomew. (Oxford University Press). Price 1 Re. 6 as.

This is one of the few best atlases that can be safely left in the hands of the Indian pupil. It contains a number of special maps of India and of the world, ane the physical maps are clear and impressive. Besides a useful index and area and population statistics of the Indian Empire, some comparative diagrams of physical geography and illustrations of mapping are also put in. It is doubtful, however, whether the inclusion of a few historical maps in the present (fifth) edition at the expense of certain important geographical diagrams has really served to make the atlas more useful.

News and Notes

The Academic Council of the Madras University has in its last meeting recommended a scheme for constituting a Department of Geography in the University whose main work for the present will be to run a Diploma Course in Geography for the benefit of teachers of the subject in schools and colleges. The sanction of the Senate is awaited; and we hope funds will be found for starting the scheme by the beginning of the next academic year.

It is a pity that the new (A-group) syllabus in Geography has not yet been finally approved, though it has been put into force in the fourth form from the beginning of the current year. Small changes and petty prunings with a view to still further lighten the syllabus is very well indeed. But the element of uncertainty about it harasses the teacher and delays the publication of suitable text-books.

* * * *

The S. S. L. C. Board has published a few text-books and books of reference at the end of the syllabus. Of these, Fairgrieve and Young's *Human Geography of the World* is specially commended for its method of treatment, which is quite modern and interesting. We may add to the list another excellent book—Russell Smith's *Human Geography* (two volumes), published by John C. Winston Co., Chicago as not—only modern and suitable but as one

that makes the study of the subject romantic for the pupils. Of course, none of these books can follow the exact order of topics in the present syllabus, as it has been specially prepared from the Indian point of view to suit Indian pupils. But a teacher who knows his subject can easily adapt them and make use of them. Under the present conditions of Geography teaching in the Presidency, good text-books written in strict accordance with the syllabus from the Indian point of view are badly needed. We hope they will not be mere pot-boilers, but will be faultless in matter and sound in method.

* * * *

Not less important than the text-book in the efficient teaching of Geography is the equipment by way of books and maps, and apparatus and appliances. Owing to the absence of Geography as an important subject of the High School for over a decade and half, the existing equipment in several schools has been neglected, and almost everywhere no attempt has been made to bring it up-to-date. It is, therefore, incumbent on managements of institutions to take immediate steps to bring up their equipment to at least the bare minimum requirements; and it is hoped that the Educational Department will also allot a special amount towards grant for geographical equipment for a few years till an adequate standard is reached.

Even more important than the equipment of materials is the equipment of the "man behind the gun"—of the teacher of Geography. The slow process of turning out a score or two of Geography L. T.'s each year from the Training Colleges, or even the starting of the University Diploma Course may not be of immediate avail The general dismay at the sight of a meagre syllabus like the present one is symptomatic of the fact of a general paucity of qualified teachers in the subject. We would, therefore, urge once more the immediate necessity of Refresher Courses being arranged at several centres, so that the actual teachers of the subject, who are usually qualified in some other subject than Geography, and who have been told off to handle the latter may learn in some measure the fundamentals of Modern Geography and of its Pedagogy. The new syllabus can also be explained, and methods of handling it and conducting practical work pointed out. While the promise of the S. I. T. U. has not yet been fulfilled, we are glad to note