

SOURCES FOR A HISTORY OF PLANT SCIENCES IN INDIA

I. EPIGRAPHY

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More than a decade ago the University Grants Commission recommended that "History of Botany" be taught as a part of Botanical training in Colleges and Universities. In the wake of welcoming the suggestion some of us interested had a dialogue as to the scope and content of the subject and were bewildered at the paucity of available information in reference to the Indian continent. It was readily recognized that the data on hand in no way commensurate with the nearly 2000 years of written history of this land. The couple of books that have been published concerning certain aspects of plants in relation to man in Ancient India (Majumdar 1927 and 1935; Om Prakash 1961; Raghavan 1964; etc.) are restricted in scope to the Vedic and early post-Vedic periods, up to the time of Varāhamihira (6th/7th century A.D.). These authors naturally depended on the *Vedas*, *Brāhmaṇas*, *Sūtras* and related *śāstric* texts together with the epics, the *Rāmāyana* and the *Mahābhārata*. Some authors have also gathered information from the medical treatises of Caraka, Suśruta and Vāgbhaṭa, who are deemed to have lived during the early post-Vedic times. Thus all attempts that have been made till now fail to cover the subsequent periods of history.

The void, however, is not because of the lack of source materials. There is a considerable body of information obtainable from Pāli, Prakṛt and Sanskrit literatures as well as from similar texts in the regional languages. These are yet to be analysed and assessed from the botanical stand point. All the same, one major drawback in utilizing the literary sources in general is the uncertainty of the date of composition of the texts, thereby blurring the correct chronological sequence.

Fortunately there is yet another category of sources which provides valuable information for a reconstruction of the past botanical history. They are the lithic and copper-plate records left by the dynasties of rulers through out the length and breadth of the country from the time of Asoka. Unlike the literary texts, the epigraphs are most often datable to the exact year in which they were executed. In doubtful cases where the year of composition is missing, it is possible to arrive at the probable date by studying the nature of the script employed in the concerned inscription.

The epigraphs come in handy in understanding the Plant Science situation from the 7th to the 17th/18th centuries. The bulk of them cover the medie-

val period. The present attempt is only a broad preliminary survey of such inscriptions chosen largely from Kannada, Telugu and Tamil regions, thereby drawing attention to the wealth of information contained in them, so that similar and more detailed studies may profitably be extended to other parts of India.

BACKGROUND

Agriculture has remained as the backbone of India from the dawn of history. When Ancient man ceased his nomadic life and settled down to grow food crops, he used a pointed stick (*laguḍa*) to dibble the grain. By gradual experience through a series of trial and error he evolved the plough for tilling operations. In course of time the plough and the flute became the symbols respectively of Balarāma and Kṛṣṇa. There is an old *purāṇic* story claiming these heroes as the protectors of the earth.

The scope of agriculture has been criptically stated in the *Śatapatha Brāhmaṇa* as consisting of four operations in sequence : ploughing, sowing, harvesting and thrushing. It is the same procedure that has persisted to the contemporary times practically with little or no change in the morphology of implements used in the operation. Several lithic records of *Amoghavarṣa* (9th century A.D.) depict the ploughshare which was obviously his royal insignia (e.g. 530 of 1958/9). The figure of a complete plough is incised on Navali inscriptions (*EC. VII (ii)*).

Such instances are clear indications of the high esteem with which agriculture was looked upon in remote times.

Although our country has been largely following the ancient methods and implements for raising crops, the changing times and tastes of people have brought new kinds of plants under cultivation during the past several centuries. For example, the early centuries of the Christian era witnessed the import of the betel-leaf and betel-nut from the Malaysian countries ; sooner or later followed the coconut from the Pacific islands. The coastal trade and commerce from the Mediterranean caused the dispersal of some kinds of grain and weed on our soil. The Muslim invasions from the Middle East from the 12th century A.D. introduced some plants and plant products of their homeland which were readily absorbed into the Indian way of life. We see an increased frequency and variety of plant introduction during the time of the Great Mughals. This was further augmented following the discovery of sea route to India from Europe by Vasco-da-gama, —cultigen crops (along with many weeds) poured in from Europe, Latin America and South Africa. The 19th and 20th centuries are too well known for the rather large-scale plant introduction from different parts of the world.

The introduced plants not only soon found stabilization on our soil, but also influenced the structure of our society. Those who took up the cultivation of imported crops came to be looked upon as belonging to new *gotras* or exogamous septs within certain castes :

<i>caste</i>	<i>sept</i>	<i>crop plant</i>
<i>Devāṅga</i>	<i>Paccipovāku</i>	<i>Nicotiana tabacum</i>
<i>Golla</i>	<i>Ullipoyala</i>	<i>Allium cepa</i>
<i>Kāpu-reddi</i>	<i>Urulugadda</i>	<i>Solanum tuberosum</i>
<i>Baliya</i>	<i>Merupa</i>	<i>Capsicum annum</i>

The cumulative effect of plant introduction during the past 2000 years or more has affected our food habits to an extent that nearly 80 per cent of vegetables and fruits that we eat today owe their origin to far off countries outside India. Such a contemporary situation naturally raises questions such as these: What were the indigenous vegetables/fruits which were in vogue in the past? What was the attitude of our forefathers towards plants in general? Did they make use of the indigenous plant resources for their daily life? Did not the locally available plants satisfy their wants and thereby create occupations or professions for the people?

The present study is an attempt to discover if Epigraphy—a wholly neglected field from the point of view of plant since history—can supply at least partial answers to the above posers.

THE LAND AND ITS VEGETATION

“The exposed wealth of the earth”,—this is how our forefathers looked upon the plant world;—thus they distinguished the treasure hidden under the ground—precious stones, metals, water, etc. The phrase generally occurs in connection with the grant of land as gift to learned persons. “There is no greater gift than granting land” is yet another phrase implying that it is the only one that yields the “exposed treasure of the earth” is found in the inscriptions of the *Pallavas* of the 7th century A.D. The tillers have been designated as the “farmer-sons” (*BKI*. I (ii). 138, A.D. 1093) or as the “sons of the soil” (*EC*. VI. Kd. 28, A.D. 1153). “Let his field become barren!” was the curse intended for him who misused agricultural land.

A free gift of land today is formalized in the presence of a *tahsildār* or magistrate by imprinting the thumb-impressions or signatures of the donor and the donee. This was not so in the past. It was an occasion of great pomp and exhibition particularly when the donor was of a royal descent. An elephant fully decorated with royal insignia and honours was required to be brought to the spot, where the donor, his Revenue Minister, Surveying Officers and Attenders were present. The *māhut* drove the elephant along the boundary line of the field intended to be given away as the gift and the animal was led by trumpeters and drummers. At every corner of the land the procession stopped and fixed the boundary stone bearing the mark of a trident or *liṅga* or bull (if the concerned parties were *śaivites*), or of kite (if they were *vaiṣṇavites*). After the land was thus measured, the donor kept his palm on that of the donee into which water was poured accompanied by the chanting of *mantras*, thereby finalizing the deed.

The commoner donor who could not afford such pageantry had the bare stone fixed at the corner limits of the field and erected a live fence of milk-weed. This is the information we see in numerous inscriptions from the 8th century A.D. (Rayakottai Copper-plates of the *Pallava* king Skandaśiṣya, *TASSI* 1957/8). The milk-weed hedge was also used as an enclosure of small villages/towns as may be seen from an inscription of the *Cola* king Rājarāja I, which states that the king took possession of Kollipakkai, a town that had been enclosed by a wall of *kulli* trees (*SII*. II. No. 10, A.D. 1020).

In still larger number of instances, however, the plants naturally growing in the different directions of the gift-land themselves constituted the 'boundary stones'. An instance of this kind is illustrated by the Udayendram Copper-plates of the Ganga king Hastimalla (Pṛthivipati II, 9th century A.D.). Two villages, Kaḍai-koṭṭur and Udayacandraṅgalam, were merged together and re-named as Vīra-nārāyaṇacceri, which was given away as a *brahmadeya* grant. In this connection the boundaries of the reconstituted area are mentioned as :

On the East—*Ficus bengalensis* standing to the East of Idaiyarrukollai on the bank of the river Palar ; *Terminalia belerica* standing to the south of it.

On the South—*Strychnos nux-vomica* ; *Ficus bengalensis* on the West of this ; *Azadirachta indica* to the farther West ; creepers of *indu* to the still further West.

On the North—*kurā* (*Ixora* sp.) ; *Ficus infectarium* to its East, *Albizzia amara*, *Morinda tinctoria*, *Randia dumetorum*.

Inscriptions that cater such accurate information are worthy of deeper study in order to understand the type of gross flora of the concerned area. The Pitāpuram Copper-plate grant of Vīra-coḍa (*EI*. V. No. 10) states that the villages Molavelli, Ponnatorra and Ālami were combined into a single unit under the name Vīra-coḍa-caturvedimaṅgalam and was gifted away to 500 *bhāṭṭas* and a few persons of specified professions. A long list of plants are mentioned as boundary symbols of the newly formed area :

<i>āri</i>	— <i>Panicum italicum</i>
<i>āvaḍu</i>	—sedge
<i>bibbila</i>	— <i>Acacia planifrons</i>
<i>buruva</i>	— <i>Bombax malabaricum</i>
<i>candru</i>	— <i>Acacia catechu</i>
<i>cevuḍu</i>	— <i>Euphorbia tirucalli</i>
<i>cīkureṅgu</i>	— ?
<i>cincānika</i>	— ?
<i>cinta</i>	— <i>Tamarindus indicus</i>
<i>daṅgu</i>	— ?
<i>droṅci</i>	— ?
<i>goṅki</i>	— ? <i>Ficus</i> sp.

<i>gottu</i>	— ?
<i>idā</i>	— <i>Phoenix sylvestris</i>
<i>ilandi</i>	— <i>Zyziphus jujuba</i>
<i>jammi</i>	<i>Prosopis spicigera</i>
<i>juvvi</i>	— <i>Ficus infectoria</i>
<i>kara</i>	— <i>Randia dumetorum</i>
<i>kumudu</i>	— <i>Gmelina arborea</i>
<i>movali</i>	— ?
<i>movi</i>	— ?
<i>musindi</i>	— <i>Strychnos nux-vomica</i>
<i>nelli</i>	— <i>Phyllanthus emblica</i>
<i>oddi</i>	— <i>Odina wodier</i>
<i>puṅga</i>	— <i>Pongamia glabra</i>
<i>rāvi</i>	— <i>Ficus religiosa</i>
<i>regu</i>	— <i>Zyziphus oenoploea</i>
<i>rela</i>	— <i>Cassia</i> sp.
<i>rellu</i>	—sugar-cane
<i>riṭṭa</i>	— <i>Sapindus emarginatus</i>
<i>tāḍu</i>	— <i>Borassus flabellifer</i>
<i>taṅgaḍu</i>	— <i>Cassia auriculata</i>
<i>tammika</i>	— <i>Diospyros glutinosa</i>
<i>tumma</i>	— <i>Acacia arabica</i>
<i>uppi</i>	— <i>Capparis sepia</i>
<i>vani</i>	— <i>Wrightia tinctoria</i>
<i>veddataru</i>	— <i>Acacia</i> sp.
<i>velaṅga</i>	— <i>Feronia elephantum</i>
<i>vellaki</i>	— <i>Terminalia belerica</i>
<i>vempa</i>	— <i>Azadirachta indica</i>
<i>veṅga</i>	— <i>Pterocarpus marsupium</i>

With such a flora is it not safe to deduce that the vegetation is typical of South Indian plains between 500 and 1500 feet altitude? The terrain was somewhat gravelly with an annual rainfall of 40"—50", fit for the cultivation of dry crops. There might have been some patches of marshy pools or canals where the sedges grew; this part of the terrain must have become flooded during the rainy season and helped the raising of sugar-cane and *Panicum* crops. The drier land was inhabited by *Pongamia* and *Cassia* plants, the leaves of which provided green manure. *Euphorbia tirucalli* came in handy as a hedge plant for the cultivated fields. *Bombax* not only yielded cotton, but also cheap timber. Sedges and *Panicum*, when dry, provided thatching materials and also for mats and baskets. *Acacia*, *Phyllanthus*, *Odina* and other trees supplied timber for construction and interior use. The medicinal uses of *Strychnos*, *Phyllanthus*, *Cassia auriculata* had already been well known.

On the whole, the donees could have lived in fair comfort by utilizing the 'exposed treasure'.

There are numerous epigraphs written from the 7th to the 17th centuries through South India which give important information about the vegetation of specific areas. Although there does not appear to be much change in the floristic composition of the indigenous flora of a locality through centuries, the crop plants and the area of cultivation have fluctuated during the period. Just as the founding of new villages/towns involved virgin land for agricultural operations, destruction of villages/towns/cities during wars rendered the once fertile land barren. With the expansion of agricultural practices a large part of the indigenous flora suffered displacement and with the destruction of urban pockets, secondary vegetation and colonization sprang up on the previously cultivated fields. Several cockpits of wars in South India were subjected to such fluctuations during the Ganga, Pallava, Chalukya, Rastrakuta, Cola and Pandya dynasties between the 7th and 13th centuries; it is during the same period that hundreds of new settlement Caturvedimaṅgalam, Brahmapuri, etc.—came into existence. A detailed study of the epigraphs concerning such cockpits through a couple of centuries is likely to throw more light on the shifting floristic and agricultural patterns of the concerned areas. It is true that such studies involve time and concentrated effort. Yet the epigraphs are the only source materials that afford the necessary information.

Cultivated plants

Most of the cultigens have their own centre of origin and directions of migration. In many instances the story is somewhat disconnected or incoherent or in need of supplementary evidence to confirm or modify our understanding. The history of some of the cultigens may now be examined in the light of epigraphical, archaeological and historical data.

(a) *Oryza sativa* L.

As at present, the paddy was an essential crop in the past as well in South India. This is the oldest of crop plants in Southeast Asia (*EJEA*. 20 : 161). When Linnaeus christened paddy with the binomial *Oryza sativa*, he stated that the plant was a native of Ethiopia and Africa. There is, however, no evidence of its African origin; its absence in the archaeological remains from the pyramids of Egypt and from the sculptural representations over there add further support to its non-African origin. Its present cultivation in North Africa is a recent episode. There are nearly 5000 varieties of paddy that are under cultivation in India and China and it appears likely that the origin of the crop should be looked for in these countries.

An opinion has been expressed that the crop was being grown in China about 2822 B.C. It is said that paddy was one of the five grains that had to be sown every year as per the orders of the king Chin-chung in 2822 B.C. However, the date of this ruler is uncertain and the tradition of sowing the five grains appears to be of more recent origin.

According to Watt (1891), the paddy cultivation reached China from India by about 3000 B.C. In India, the existence of varieties of paddy can be traced back to nearly the same period. The following table (taken largely from Ghosh 1961) lists the sites of discovery and their approximate age :

Kalibhangan, Rajasthan	? 3000 B.C.
Lothal, Gujarat	2300 B.C.
Adichanallur, Tamil Nadu	? 2000 B.C.
Rangpur, Gujarat	2000-1500 B.C.
Navdatoli, Madhya Pradesh	1500-1000 B.C.
Hastinapur, Uttar Pradesh	1000-800 B.C.
Bank of River Sipra, Madhya Pradesh	500 B.C. or less
Rupar, Punjab	600-200 B.C.
Nagda, Madhya Pradesh	500-200 B.C.
Pataliputra, Bihar	405-115 B.C.
Kunnattur, Tamil Nadu	300 B.C.
Khorakot, Punjab	100 B.C.
Kolhapur, Maharastra	100 A.D.
Rangmahal, Rajasthan	100 A.D.-400 A.D.
Periapuram, Kerala	Early Christian era
Nevasa, Maharashtra	1318-1759 A.D.

There are considerable literary and epigraphic sources that confirm the existence of paddy varieties in the historic period. The *Atharva-Veda* speaks of *vr̥hi* (VI. 140, 2 ; VII. 7, 20 ; IX. 6, 14). References to the same variety is also found in *Śatapatha-brāhmaṇa*, *Vājasaneyī-saṃhitā* and *Chāndogya-upaniṣad*. From *Taittirīya-saṃhitā* we learn that paddy ripens in the rainy season. According to Caraka the variety *vr̥hi* was a crop of the rainy season, the variety *śālī* a winter crop and that the variety *ṣaṣṭika* ripened in 60 days in summer. The same author tells us that *vr̥hi* was a much inferior variety than the other two ; that the most popular varieties were *raktasālī*, *mahāsālī*, *kalama* and *kṛṣṇavenī*, a black sub-variety of *vr̥hi* ; that *ṣaṣṭika* was nutritious and suited for daily use. From the medical treatises of Caraka and Suśruta we obtain an idea of the varieties and sub-varieties of paddy that were under cultivation during their times :

I. *ŚĀLĪ* : *lohita*, *kalama*, *kardamaka*, *pāṇḍuka*, *sugandhaka*, *śakunāhrta*, *puṣp-pāṇḍuka*, *puṇḍarika*, *mahāsālī*, *sītabhīruka*, *rodhrapuṣpaka*, *dirghasūka*, *kāñcamaka*, *mahiṣa*, *mahāsūka*, *hayanaaka*, *duśaka*, *mahāduśaka*.

II. *VRĪHI* : *kṛṣṇa-vr̥hi*, *śālamukha*, *jarumukha*, *nandimukha*, *lāvākṣaka*, *tvaritaka*, *kukkuṭāṇḍaka*, *pāravataka*, *pāṭala*.

III. *ṢAṢṬIKA* : *ṣaṣṭika*, *kaṅguka*, *mukundaka*, *pitaka*, *pramodaka*, *kākalaka*, *asana*, *puṣpaka*, *mahāsastika*, *cūrṇaka*, *kuravaka*, *kedāra*.

Hiuen Tsang (6th century A.D.), while speaking of a paddy variety *mahāsālī*, mentions that the cooked rice was fragrant, that this variety was under cultivation

only in Magadha kingdom and that it was served for kings and emperors. We learn that the same variety was being cultivated in 1200 A.D. at Managoli and Abballur (*EI. V. Nos. 3 and 25* respectively). Hemadri (13th century A.D.) also speaks of this variety (Gode 1961). Thus it appears that a paddy variety which was restricted to the Magadha kingdom in the 6th century had become extended in cultivation in South India by the 13th century.

A Cola record of the same period mentions that a variety *kār* was under cultivation in the Tamil Nadu (*SII. II. No. 22*). An epigraph dated 1130 A.D. speaks of another variety *kāḍakki* (*EC. IV. Kp. 18*), which literally means 'forest (wild) rice'.

Records of the existence of paddy varieties in India are thus available from the pre-Christian times up to the Medieval period. Consequently the question—Is it not probable that India would form *one of the centres of origin* for the cultivation of paddy?—becomes more significant.

A majority of Tamil scholars assert that the generic epithet of paddy has been chosen after the Tamil name *arisi* (rice). This crop was known to the ancient Greeks as *oruzā/oruzon* and to the Arabs as *arous/rouz* (compare the Sanskrit *ārunya* = rice). It was through the expedition of Alexander (400 B.C.) that the paddy/rice became known to the Greeks and other Mediterranean countries. As per Strobe's statement paddy was under cultivation in Bactria, Babylonia and Susida. There is also proof of its cultivation at about the same period in the Euphrates valley and Syria. It gradually spread to Italy, Spain and other coastal areas of the Mediterranean sea. While it is true that rice was a commodity of commerce between South India and the Mediterranean coasts, the argument that the Tamil name was chosen as the generic epithet appears ridiculous. It is more likely that Linnaeus modelled it after the Greek and Arab sources rather than from the Tamil. It should also be remembered that the word *Oryza* lends itself to be more directly derived from *oruzā* rather than from *arisi*.

(b) *Eleusine coracana* Gaertn.

Rāgi has been the staple food grain of the poor through centuries in the Karnataka and Andhra provinces. The centre of origin of the crop is involved in controversy, —whether Africa or India. The near relatives of this species are found in Africa (although none of them are cultivated) and this fact raises doubts in reference to its presumed Indian origin.

There does not appear to be any mention of this crop prior to the 10th century A.D. either in literature or epigraphy. An inscription of the Chalukya king Āhavamalla states that the *nalḡavundas* (a category of chieftains) will be subjected to punishment should there be a misuse of the gruel prepared from *rāgi* (*EC. II. Sb. 477*). From some of the Pandya inscriptions of the 13th century we learn that the grain was being grown as an agricultural crop (*EI. XXIV. No. 22* ; 66 of 1916 ; 109 of 1904 ; etc.).

There is a report of the discovery of a wild variety of *Eleusine coracana* growing in South India (CS. 4 : 106)*. It is very likely that this plant was domesticated under cultivation by about the 10th century A.D. Very likely this process could have taken place in the Karnataka region. Even today, the densest area of cultivation of the crop coincides with the area of distribution of the wild variety. It may also be noted that the Kannada name of the plant, *rāgi*, is retained in modified forms in areas of cultivation that lie outside Karnataka :

Kannada	— <i>rāgi</i>
Telugu	— <i>rāgulu</i>
Tamil	— <i>rāgi</i> , (<i>kel</i>) <i>varagu</i>
Marathi	— <i>nāgli</i>
Gujarati	— <i>nāgli</i>
Sanskrit	— <i>rājika</i>

(c) *Cocos nucifera* L

This is a plant known to the South Indians from historic times. The plant was unknown to the Vedic people and to the regions inhabited by them. The Sanskrit name *nārikela* was coined in the Medieval period ; so also the term *kabpaka*. The latter term has migrated to Malaya and Malaysia in more recent times with the diffusion of Hindu culture and represents the same commodity.

The coconut grows profusely on the coasts of South India. It is cultivated to some extent in the interior parts as well. Extensive exploitation of the plant, however, appears to have begun in the coastal areas.

There are numerous epigraphs incised during the Medieval centuries which refer to bequests of coconut gardens to temples. It is probably during the earlier part of this period that the coconut-milk began to be used as an article for the sacred bath of the deity in temples and received *āgamic* sanction for its role in ritualistic practices. The coconut also found entry into domestic rituals, attained sanctity as an offering to God and stabilized itself as an object of gift to guests on occasions like marriage and other ceremonies/festivals. There is no doubt that these practices originated in the land in which the trees grew.

The common name with which the coconut is known in the South Indian languages are of the same cognative form :

Tamil	— <i>tennai</i> , <i>tennamuram</i> , <i>tenkāi</i>
Malayalam	— <i>tengu</i>
Telugu	— <i>tenkāyi</i>
Kannada	— <i>tengu</i> , <i>tenginakāyi</i>

The root for the above names is *ten*, which means south ; *tenkāi*, the nut (fruit) belonging to the South ; *tennaimaram*, *tenginamara*, the tree that belongs to the South. Therefore which could be the southern country that lies to the south of South India ? No doubt Ceylon comes to the mind. But here too the names for

* On the basis of chromosome numbers Mehra is inclined to favour the African origin of this crop plant (CS. 32 ; 300).

the coconut are derived from the root *ten*, again directing towards south. Therefore one has to look for the islands of the South Pacific—Malaysia, Polynesia, etc. Because of the natural growth of coconut on these islands, it is not wrong to presume that the palms should have reached Ceylon and South India from these islands. Two methods of migration are postulated : (i) The ripe nuts were caught up in the oceanic currents ; the outer fibrous covering possessing bouyancy, floated to the neighbouring coasts. (ii) Since the sea trade was continuous between the Mediterranean and Pacific islands from the commencement of the Christian era, the nuts could have become dispersed through this agency.

(d) *Borassus flabellifer* L.

South Indian communities knew this plant well from historic times, particularly from the time of the origin of script for the "Dravidian" group of languages, as the leaves of the palm provided the writing material. An epigraph of the Abhira Vasusena (3rd or 4th century A.D.) describes the consecration of *aṣṭa-bhujasvāmi* and mentions the names of the donors ; in this connection it details their pious acts amongst which was the act of planting groves of *Borassus* palms (81 of 1959/60). A 9th century inscription of the Pallava Vijaya-Nandivarman mentions that a village gifted to God Mahadeva at Tirukattuppalli was surrounded by rows of this palm (*SII*. II. No. 98). The raising of a *Borassus* grove in the name of one Kodasetti's father finds mention in a 16th century lithic record (394 of 1926).

Man has made use of the *Borassus* palm to the same extent as coconut. Yet the former has not attained a coordinate status of esteem and divinity. Unlike coconut, *Borassus* has not entered our religious or ritualistic life ; on the contrary, it is prohibited !

Strangely though, the leaves of the palm have enjoyed an exalted status from early times as a writing material. A 9th century lithic record from *Tandalam* testifies that the palm leaf was already in use for writing documents and literature (*EI*. VII. No. 5). Such a situation continued to be so all over South India till about the 18th century, although paper had been introduced by the East India company in the 17th century. There is an old custom of worshipping old palm-leaf manuscripts during the celebration of Sarasvatī-*pūjā*. It is to be clearly appreciated that this honour is certainly not to the palm leaf but to the writing on it ! As already noted, man exploited the *Borassus* palm for his needs to the same extent as he did with the coconut, and he fully appreciated its utilitarian value. As if to pay an indirect testimony, an undated epigraph lays down that one who cuts down a living *Borassus* palm will be punished according to the royal ordinances (246 of 1906).

(e) *Ricinus communis* L.

Some of the epigraphs of the Vijayanagar rulers of the 16th century mention castor as one of the commodities of trade. De Candolle (1886) contended that

the near relatives and wild varieties of castor are concentrated in Abyssinia and argued that the plant is of African origin wherefrom it spread to other regions. Watt (1892), however, insisted that the plant originated in India itself. His argument was that the plant had a Sanskrit name, *eraṇḍa*, which speaks of its ancient character on our soil and that the names in the regional languages are all derived therefrom; and that there is no relation between the name used for this plant in Africa and the ones in India. It is also true that *eraṇḍa* was known to Caraka and Suśruta.

The common names of the castor in Egyptian and Ancient Greek tongues are *kikki*, *kikku*, *unakku*; and these are the same names in use today as well. In the South Indian languages, the words are: *āmanakku* (Tamil), *amadam*, *amdi*, *sittamindi*, *amudapu* (Telugu), *āvanakku* (Malayalam). It is a matter for the Linguist to decide if the "Dravidian" names are not suggestive of the non-Indian counterparts. Kannada did not make use of any of these names; it appears to have evolved the name *haraku/araku* because of the cracking noise produced by the ripe fruits while splitting on the tree.

It must be emphasized that castor has always remained as a cultivated plant on our land and it is never seen in a wild condition as a constituent of the indigenous flora. Watt's observation that it has a Sanskrit name indicating its indigenous or ancient character cannot be taken seriously as many exotic and introduced plants also have been freshly christened with Sanskrit names following the establishment of the exotic taxa on the Indian soil. However, in view of a plant by name *eraṇḍa* having been mentioned in old medical treatises in India the question arises as to its botanical identity. These texts uniformly mention purgative property to the oil contained in the seeds. Could this not be some indigenous plant—yet to be identified—and not the exotic castor? Is it not likely that the oil content of the indigenous plant was low or that there was a scarcity of obtaining the raw material or that its medicinal action was less potent than that of introduced castor? When this plant exhibited/relatively higher oil content, easy procurability and increased therapeutic potential, the very same name that had been in use for the indigenous plant could have been transferred to the castor.

(f) *Cicer arietinum* L.

An inscription of the Kalacurya king Bijjala (1161 A.D.) speaks of a baked preparation of the bengal-gram, *kaḍaleya kaḍubu* (*EI*. V. No. 3A). This plant is not a component of our natural flora and its use for ceremonial and ritualistic purposes was prohibited by Vijñāneśvara (c. 1100 A.D.), a *smṛti* writer. It clearly means that the plant was an exotic and therefore failed to obtain *śāstric* sanction. Yet in the succeeding centuries the gram was identified as one of the *nava dhānyas* (the 'nine kinds' of grains equated with the *nava grahas*, the 'nine planets'). Furthermore, we learn from the 16th century epigraphs that the grain was used in the preparation of *naivedya* (offering) to Gods (*SII*. IV. No. 250; *EI*. VIII. No. 10).

Southern Europe (Italy, Greece, etc.) is the homeland of *Cicer*. The crop was imported into Egypt about the early years of the Christian era. The Western Helens brought the commodity into India through land route, which probably happened in the time of Darius (521-485 B.C.). Or at the time of the occupation of the Punjab by Alexander in the first quarter of the 1st century A.D. (Gode 1961).

The local name for *Cicer* in all the North Indian languages is the cognatic forms of *canaka*. In the "Dravidian" group of languages in South India the term *kaḍalai* has been in uniform use through centuries. It should also be mentioned that this term bears no relationship whatsoever with the local names used in its homeland. *Kaḍal* in the "Dravidian" languages means ocean; hence that grain which reached South India through the sea route is *kaḍalai*. It is likely that the gram, after having become established as a crop in the Punjab, or from its homeland itself, could have reached the West coast of South India through coastal trade.

Code (1961) has accumulated convincing evidence to show that this gram was used in the early eras as a horse feed. Therefore it is likely that its introduction into South India also was associated with the importation of horses. Old Tamil literature (7th/8th centuries onwards) is full of references to the use of elephants in wars but not generally to the use of horses. In South Indian epigraphy we hear of *kutirai-cettis* (horse-traders) from the earlier part of the Medieval period. The earliest epigraphic record of a horse-rider occurs in a Kadamba inscription of the 4th century A.D. (*EC. VII. Sk. 76*); by about the 8th/9th centuries this animal had found an important place in battles. This could be the probable time of the arrival of *Cicer* into South India.

(g) *Piper betel* L., *Areca catechu* L., and *tāmbula*

The earliest epigraphic reference to *tāmbula* occurs in a Gupta inscription incised in the year 473 A.D. (Fleet, *Gupta Inscriptions*, No. 18):

tānurāya kāntyupacitopi svarga-hara
tāmbula puṣpaviḍhinā samalamkr̥topi
nārījanah śriyam upāli na tavad
yāvanna padyumaya-vastra-yugāni dhatte

(The women may be young and charming; according to custom they may decorate themselves with garland, *tāmbula* and flowers. But, when they go to meet their lovers in the tryst, they do not fail to put on silken garments).

Dhanika's Nagar inscription (685 A.D.) also refers to the *tāmbula* (Guleri, *S.S.* 1945, in *R. K. Mookerji Comm. Vol.*) in a verse which informs of the cruelties caused by the king as a result of which (among other things) the redness of their lips caused by *tāmbula* disappeared.

We learn from the epigraphs of the 8th to the 10th centuries that betel leaf and areca nut were important crops under cultivation in the South Kanara and Bellary districts; the inscriptions of the subsequent three centuries inform us that

the area under cultivation extended to other neighbouring districts. As the number of epigraphs giving the information are very large, the contents of a few random examples are cited below :

Dharwar district, Gadag taluk, Hosur.—An inscription of Jagadekamalla mentions that Aichagavunda caused the erection of a *basadi* (Jain monument) and bequeathed an areca garden (*BKI* I. i. No. 65; *SII*. XI. i)—1028 A.D. Another inscription from the same district mentions that the 400 public men of the Brahmapuri received 100 areca nuts from every one of the areca gardens (*SII*. XI. i. No. 96)—1061 A.D. Yet another record reports a grant of rows of areca palms, oil mill and flower garden for the service of God (*SII*. II. i. No. 107)—1050 A.D. The '500 merchants' released one *kāṇi* (coin) on every bundle of betel leaves (*SII*. XI. i. No. 141)—1079 A.D.

A record of Rājarāja Codagaṅgā informs of the 'old custom' of exchanging *tāmbula* (*EI*. VI. No. 35)—188/9 A.D. An inscription of Kopperunjinga in the South Arcot district, dated in his 26th reign year states that water facilities were provided from the temple of the place to one Senattarayar for the cultivation of areca (433 of 1921)—c. 1245 A.D.

The leaders and traders of Vikramapāṇḍyapura donated the income from the betel nut and betel leaf gardens for services in the temple of Kailasamudaiyanayanar (316 of 1918)—1335 A.D. There were gardens of areca growing between the rivers Kollidam and Vellar (532 of 1920)—1263 A.D.

An inscription of Gaṇḍagopāla states that an areca garden was given away as gift to the Lord of Arikkarantisvaram, Karivedu, North Arcot district (58 of 1945/6)—1295 A.D. A land was sold for raising an areca garden in the name of Lord Kannapadevar (125 of 1922)—1023 A.D.

Another set of records supply miscellaneous information about the betel leaf and nut. The Kuḍumi-yāmalai inscription of the Cola king Kulottunga I records the arrangements made for the daily offering of these two items to God Tirukkunramudaiya-nayanar (353 of 1904)—c. 1086 A.D.). Kamadevavel of Arakalur gave money for the supply of nut and leaves to the *Devī* shrine at Āḍuturai (20 of 1913)—1169 A.D. The Hulgur inscription of Vikramāditya IV mentions three varieties of the betel leaf, viz. *ekkavattige*, *pālai* and *kālai* (*EI*. XVI. No. 24)—1077 A.D.

From the contents of inscriptions such as these it is possible to obtain an idea as to the spatial expanse of the areca nut and betel leaf between the 10th and 13th centuries. Although there is clear literary evidence for the existence of chewing *tāmbula* prior to the 10th century, there are not many epigraphs that mention the commodities or that give information pertaining to the loci of cultivation. Such a situation is suggestive of the fact that the habit of chewing the *tāmbula* had remained largely as a personal choice and had not become a common enough practice among the public to find frequent reference in epigraphy. The rather sudden rise in the frequency of records giving positive information during the 11th to the 13th centuries is similarly suggestive of the growing popularity of the *tāmbula* habit.

As a result, the commodity not only became a daily necessity to satisfy the desire but also entered into the social and religious life of the people. It received *śāstric* sanction as an article of use in rituals and ceremonies such as those connected with birth, marriage and death and formed an integral part of *dakṣinā* for the priests. Very soon the *tāmbula* attained a status of sanctity by being offered to God. The 12th century Sanskrit texts (e.g. *Manasollāsa*) declare that the chewing of *tāmbula* was a *bhoga* (enjoyment). The later *Dharmaśāstras* confirm it and place the official seal (Gode 1961). It is about the same period that the area of cultivation of the constituent plants of *tdmbula* expanded in order to meet the ever increasing demand. They also became important commodities of trade and commerce and earned revenue in no small measure to the royal treasury.

In spite of this astonishing growth and implication in the personal, social, religious and economic life of the common man, the betel leaf and areca nut do not initially belong to the Indian continent; they are elements that have come from outside and have become merged into our culture. The word *tāmbula* itself owes its origin to the Malaysian region and is derived from the term *tembel*. Areca too has a similar ancestry. Look at its name in various languages :

Andaman	— <i>ah-buḍ-ḍak, ah-puruḍ-ḍak</i>
Burma	— <i>ah-ḍak, quan-ḍi-beng</i>
Singapore	— <i>puvak, puvakka</i>
Sanskrit	— <i>guvaka, puga, rubaka, guvaka</i>
Malayalam	— <i>adaka, kavangu</i>
Kannada	— <i>adake, adike, kavangu, kaungu</i>
Tamil	— <i>adakkai, pakku, kamuku</i>
Telugu	— <i>vakka, pokavakka</i>

The betel leaf does not possess any distinctive name of its own in any of the Indian languages or dialects. Throughout North India it is merely *pān*, a leaf; although similar is the situation in the South Indian languages and dialects, *ilai* (leaf), the origin of the alternative name *vettalai*, again points towards Malaysia :

Malaya	— <i>otai, vatat</i>
Singapore	— <i>vattat, vat-tat</i>
Burma	— <i>vettal, vettal</i>
Tamil	— <i>vettalai (verrilai)</i>
Malayalam	— <i>vetta, vetrila, vettila</i>
Kannada	— <i>vileyadelai</i>

(The Sanskrit name *nāgavalli* is a more recent coinage)

(h) *Nicotiana tabacum* L.

There is a Telugu verse in currency, the authorship of which has been mischievously attributed to the much renowned poet Vemana, which extolls the sublime qualities of the snuff. The genuine author, however, must be a more modern snuff.

addict. The tobacco entered India for the first time in the 16th century A.D. and was brought under cultivation by the Portuguese in the beginning of the 17th century. Today the products of tobacco have encaptured the hearts of millions of us and the plant has been in extensive cultivation in various parts of India.

The tobacco has a fascinating history. It hails from South America. It was intimately connected with certain aspect of the ritualistic life of people. The earliest record of the plant to the outside world is seen in the diary of Columbus in November, 1492 A.D.

In 1519 the plant was brought to Spain from Hispionola.

In 1556 it reached France.

In 1558 the Dutch sailors took it to Holland.

By 1561 the tobacco was known in Italy.

In 1565 it spread to Germany.

In 1570 it reached West Africa.

In 1573 the smoking of tobacco commenced in England, a gift of Sir Francis Drake.

By 1590 the English and the French students in Leiden had become addicts to smoking.

In 1595 tobacco entered Asia.

In 1599 it occupied Turkey.

In 1600 smoking was introduced into Russia by English sailors ; the Portuguese settled in Persia picked up smoking habit ; cultivation of tobacco began in the Philippines.

In 1603 occupation of Egypt.

In 1605 *cultivation started in India under the Portuguese agency ; cultivation in Japan.*

In 1608 it spread to China.

In 1610 introduction into Ceylon.

Such is the bird's-eye-view history of tobacco. This is the only crop which spread throughout the major part of the world just in the course of one century and encaptured the health, wealth and palate of a considerable section of the peoples.

References to tobacco in Indian literature occur only from the 16th century (Godé 1961). This does not mean, however, that smoking and snuffing were unknown to Indians prior to this date. Old medical treatises prescribe specific herbal preparations to be inhaled through these practices as remedies for certain types of ailments. The tobacco smoking, snuffing and chewing, however, started in India as late as the reign of the emperor Akbar.

In epigraphy also records of tobacco appear only in the 17th century. By this time the commodity had become a revenue yielding article of commerce and was permitted to be transported from place to place (*EC. VII. Sh. 28*). Inscript-

tion numbers 92 and 166 of Ceded Districts inform that the public of Tanjatur collected tax on tobacco from one Narayana Reddi (1716 A.D.). This is just in keeping with the history of the tobacco—wherever it was introduced, taxes were levied on it sooner or later.

(i) *Eugenia aromataca* (L.) Baill. (= *E. caryophyllata*)

The clove finds a casual mention from the 11th century A.D. onwards in epigraphy (*EC*. VII. Sa. 109, 1042 A.D. ; *EI*. XIV. No. 15, 1173/4 A.D.).

This product had been in use in China as far back as the 3rd century B.C. Yet the plant is not indigenous there. It is not a native of India either, although Caraka and Suśruta detail its medicinal uses. Yet the authors of Indian literature have made the plant indigenous to India ; some of the poets who composed the script of inscriptions also followed suit and both in literature and epigraphy (*EI*. XIV. No. 15, A.D, 1173/4) *lavaṅga* appears as a native plant of our country, often with the fanciful attribution of a climbing habit for the plant (*lavaṅgalatā*). This contribution of our poets should only be looked upon as a *kavisamaya* (Poetic Convention) and nothing more.

The clove is an endemic element in the islands of Molucca. About four centuries ago it was introduced as a cultigen into other Pacific Islands like Java, Sumatra and Borneo by the Dutch. It was grown successfully in Zanzibar about 150 years ago. These are the very countries that have been supplying the product for the world market. The importation of the plant into India was accomplished during the later part of the 19th century as an experimental measure ; a few plants are under cultivation in the Nilgiris, Travancore and Kuttalam forests.

Thus at no time in history the clove trees grew on our soil either as an indigenous element or as a commercial crop. One should not forget that from the early centuries of the Christian era there was extensive sea-trade between the east coast of India and the Pacific Islands through China just as there was exchange of commercial activity between the west coast and the Mediterranean countries. In fact the trade route was a single stretch from the latter to the Pacific Islands, touching on the way India, Ceylon and China. It is through this agency that clove became disseminated to India and other Western countries.

(PUBLIC GARDENS AND TEMPLE GARDENS (*NANDAVANA*))

There are innumerable references in literature for the existence of gardens of various kinds in ancient India. The epigraphic data also conform that there were public gardens as well as private ones (Chidananda-murthy 1966). The kings in particular had their own gardens for private enjoyment. The Pāṇḍya king "Sundarapāṇḍya was taking food in his garden (called) *puttan*...." (332 of 1916, 13th century A.D.).

Special mention may be made in this connection that the daily life of people in the Medieval South India was intimately connected with the temple. The latter

grew into a mammoth institution in itself, giving great impetus to all kinds of cultural and religious activities. In other words, the public and the temple established between themselves a bond of mutual reprocation so much so that two became hardly inseparable in several respects. The temple had to meet various types of expenditure in connection with its religious activities—daily worship, rituals, festivals and processions, offering of hymns (Swamy 1970, *JIH* : 95-128), chanting Vedas, fostering literature, dance, music, sculpture, etc. The royal and public contributions for the fulfilment of such items were given in the form of cultivated/cultivable fields, plantations, gardens, etc. and also of munificent bequests of money or gold.

Erremanayaka who was in charge of the State Treasury of Kulottunga Rajendra Coda donated a grove of coconut palms to God Bhāvanārāyanasvāmi of Bapatla (229 of 1897, 1163-80 A.D.). There are many other instances of gifts of plantations of the same crop (e.g. 220 of 1909 ; 484 of 1912). A grove of palmyra (*Borassus*) was donated by one Nilangarayar to the Dharmesvara temple in the name of his father (285 of 1897, 1303 A.D.) ; a plantation of the same crop was gifted away by the Coda Kulottunga II (49 of 1909, 1175 A.D.). Sadāśivarāya of Vijayanagar donated a betel nut plantation to a Jain temple of Śāntināthasvāmi (*SII*. IV. No. 247). The temple was benefitted in two ways by receiving such endowments : (i) the products found direct use in the daily rituals, and (ii) the excess of produce was sold or leased out and the cash recovered therefrom was utilized for other items of expenditure.

There are also records of the gift of fruit-yielding and flower-yielding plantations (orchards/gardens). Kopperunginga caused the abolition of taxes of a land and ordered that a flower and fruit garden should be raised there, the produce to be used as offering to the Lord Mahadeva of Tiruvennainallur (432 of 1921). One Potinayudu built a temple of Sarvesvara and raised fruit and flower plants for His use (333 of 1915, 1277 A.D.).

Apart from gardens/groves/plantations of the type owned or bequeathed by the public to the temples, the latter themselves possessed a separate category of garden called *nandavana* ; these gardens were the exclusive property of the temples. The superintendence of the public gardens was in the charge of the 'leaders' of the place (often spoken of as *mahājana*) in contrast to the *nandavana* which was solely managed by the temple superintendents themselves (often spoken of as *māheśvaras*).

Even a cursory glance of the inscriptions from the 10th to the 14th centuries is enough to convey not only the high frequency but also the vastness of land area that was given away for raising *nandavanas*. There are some temples which have received repeated land grants for this purpose continuously for 250-300 years. The Naṭarāja temple at Chidambaram, South Arcot district, Tamil Nadu, may be cited as an example. Starting from the Imperial Colas of the 10th century, up to the *Tuluva* dynasty of Vijayanagar, there are over 200 inscriptions declaring land gifts for the temple gardens.

The main purpose of the *nandavana* was to balance the economy of the concerned temple by growing flower- and fruit-yielding plants, the products of both of which were essential for the daily worship and other ritualistic practices; in short, as the Kannada inscriptions describe, for 'aṅgarāṅabhoga' of the enshrined God. An inscription of the Cola king Rājarāja I records the gift of land to a subject for raising a flower garden for supplying flowers daily to the temple of Virāśekhara at Tiruvidaik-kali, Tirukkivilur (310 of 1921, 987 A.D.). An epigraph of another king of the same dynasty, Vikrama, mentions that Vaikhanasa-priests of a Viṣṇu temple in the same town had bought 1000 *kuli* of land for the purpose of donating it to a gardener; having realized its inadequacy, handed over some more measure of the temple land in order to facilitate him to provide for the needed quantity of flowers and flower garlands for the daily 3-time worship of the deity (348 of 1921, 1130 A.D.). A *brāhman* of Munaiyaradityacaturvedimaṅgalaṃ gifted a land for raising a *nandavana* and provided for the supply of flowers therefrom to God Vedapurīśvara; the daily quantity to be delivered was a garland nearly 30 feet long (527 of 1921, 942 A.D.). The worship of the temple deity with flowers was called *puṣpayagna* and several lithic records mention this term in connection with *nandavanas* (e.g. 427 of 1958/9, 13th century A.D.).

The commonly cultivated plants—flowering and fruiting—in *nandavanas* were (only a couple of the concerned epigraphs are mentioned as examples below):

Mangifera, *Artocarpus*, *Citrus* fruits, *Stereospermum*, ? *Chrysanthemum* (BKI. I. ii. 152, 1103 A.D.)

Cocos, *Artemesia*, *Origanum*, *Michelia*, *Nymphaea*, *Mangifera*, *Artocarpus*, *Areca*, *Pandanus* (EI. XXII. Larger Leiden Copper-plates)

?*Chrysanthemum*, *Ixora*, *Jasminum*, *Michelia*, *Mimusops*, *Mangifera*, *Artocarpus*, *Cocos*, *Citrus* fruits (EI. VII. No. 18, 1316/7 A.D.)

Cocus, *Areca*, *Mangifera*, *Citrus* fruits, *Ficus glomerata*, *Eugenia*, lime, *Phyllanthus emblica*, *Musa* (38 of 1889).

There were also *nandavanas* for growing specific varieties of plants. The villages assembly, merchants and priests of Tiruvidaimarudur took over a land from a *malaikkara* (flower-garland seller) in order to cultivate exclusively *Jasminum* (SII. XIII. No. 270, 973 A.D.). Some epigraphs of the Colas speak of exclusive temple gardens where *Michelia* was cultivated (249 of 1907 18 of 1922). A royal order to cultivate specifically *Jasminum* (*mallikā*) and *nandiyāvattam* (?*Tabernaemontana*) in the *nandavana* was issued (313 of 1913, 1212 A.D.).

The enthusiasm with which the land was donated for the purpose of raising *nandavanas* sometimes involved stupid procedures. As an example may be cited the act of a Pāṇḍya king who ordered the cutting down of fruit-bearing jack plantation in order to make way for a temple garden! (369 of 1916).

Several *nandavanas* were known by specific names chosen after the king who ruled or after royal donors or after their titles (*birudas*):

- Virapāṇḍyan tirunandavanam* (520 of 1911, *Sundarapāṇḍya* I, 1216-35 A.D.)
Virāṣekharan tirunandavanam (524 of 1911, *Sundarapāṇḍya* II, 1239-51 A.D.)
Rājendracolan tirunandavanam (172 of 1915, 1059 A.D.)
Vikramapāṇḍyan tirunandavanam (79 of 1918)
Śatruḡandan tirunandavanam (342 of 1921)
Rājādhirājan tirunandavanam (45, 48 of 1925)

There were also those which were named after common people :

- Virāṭarāyan tirunandavanam* (433 of 1915, 1322 A.D.)
Iladarāyan tirunandavanam (434 of 1915)
Tambikkunallān tirunandavanam (430 of 1916)
Vijayanārāyaṇan tirunandavanam (693 of 1916, 1257 A.D.)
Verāḍuḍaiyān tirunandavanam (697 of 1916)
Taḍakāṭṭuḡandan tirunandavanam (315 of 1921, 1073 A.D.)
Cirrukkuḍāḍān tirunandavanam (338 of 1921, 1004 A.D.)
Perundimāṇikkam tirunandavanam (380 of 1921, 1115 A.D.)

As already remarked, the *nandavanas* were being managed by the temple staff, for the most part constituted of the owners/trustees of the temple, the *māheśvaras*. Many epigraphs clearly indicate the participation of government also in such matters. A committee of the type functioned in the Naṭarāja temple, Chidambaram during the Medieval period. Some inscriptions of the Cola king Kulottunga III detail the constitution of such a committee :

- (a) representatives of the government—
Tennavan Brahmarāyan
Jayatunga Pallavarāyan
Tillaiyambala Pallavarāyan
- (b) representatives of the temple—
Māheśvara kankāni śeivar (?*Māheśvara supervisors*)
Śrīkāryam śeivār (*worshipping priests or supervising priests*)
Sānudāyam śeivār (*persons in charge of public festivals*)
Koyilnāyakam śeivar (*managers of the temple*)
Tirumālīkaikurru śeivar (?*persons in charge of temple repairs*)
Kaṇakkar (*accountants*)

Committees such as these or the temple trustees themselves (*tānattār*, *sthānatār*, *sthānika*) were managing the temple and its properties including *nandavanas*. They were to decide transactions such as buying or selling land for temple garden, donating temple property for the purpose, appointing gardeners, determining their emoluments, etc.

Some of the provisions that were in vogue for the proper and meaningful functioning of the *nandavanas* during the Medieval period are quite interesting. There was a royal order issued to the effect that water from porpora-rāvi tank which was the property of Lord Narruṇainātha was forbidden to be used for any purpose

other than the cultivation of temple garden (197 of 1925). There are several inscriptions where the unsatisfactory gardeners were dismissed and new recruitment made (461 of 1916 ' 422 of 1919 ; 111 of 1915 ; *EI.* III. No. 12 C ; etc.). The general type of emolument fixed for gardeners was in kind or in cash or in a combination of both. Often, however, they received a part of the food offered to God as *naivedya* (offering) in return for their services (440, 691 of 1916, etc.). Sometimes they were exempted from a tax (*prasāda vari*, tax on offered food) usually levied on the offering (432 of 1916). There is a lithic record mentioning emolument in the form of cloth and garden implements (430 of 1921).

A. *On some cultigens in nandavanas*

Mācapatre, maruga, davana

The botanical identity of these plants are respectively—*Artemesia vulgaris* (Compositae), *Origanum majoranum* (Labiatae), and *Artemesia pallens*. The regional names, however, have become mixed up in usage causing much confusion.

Artemesia vulgaris

Local names :

Tamil—*davana, marukolundu*

Malayalam—*kolunna*

Telugu—*davanamu*

Kannada—*mācīpatre, mancīpatre*

Hindi—*mājtari, davana, marvā*

Epigraphic references :

BKI. I i. 108—1069 A.D.

432 of 1904—1137/8 A.D.

553 of 1904—1142 A.D.

EI. XXII. No. 32—993/4 A.D.

SII. II. No. 98—(*Pallava Vijayanandivarman*)

Origanum marjoranum

Local names :

Tamil—*maruvu*

Malayalam—*maruvam*

Kannada—*maruga*

Bengali—*maruu*

Sindhi—*marvo*

Arab—*mardakus*

Asia Minor—*mardakus*

Epigraphic references :

BKI. I i. 108—1069 A.D.

EI. XXII. No. 32—993/4 A.D.

Artemesia vulgaris grows wild on the foot hills of the Himalayas and also along the Western Ghats in South India. The leaves contain a fragrant essential oil for which the plant is valued. The plant is under cultivation to a limited extent in some parts of South India over centuries and often it is not unusual to find it elsewhere as an escape; the most favoured habitat for the escapes is the live hedge of fields under cultivation. The use of the leaves of this plant in garland-making is an old practice that has come down to our own times.

This plant is the true *māci* (*mañci*) *patre* of Kannada and *majatri* of Hindi, although it was known by the name *davana* in South Indian languages.

The second plant, *Origanum marjoranum* is not a native of India, but belongs to the Southern coast of Europe, North coast of Africa, Asia Minor and other Mediterranean countries. A study of the regional names of this plant (given above), clearly establishes that they are all derived from *mardkus*, the native name in Asia Minor. Possibly the plant came to India during the earlier part of the Medieval period through coastal trade from the Mediterranean countries.

The third plant that has entered the arena of confusion is *Artemesia pallens*. This is an aromatic herb with much dissected leaves of bluish hue and is found in cultivation only in certain very restricted parts of South India. This plant has come to be known as *davana* especially in the Karnataka regions, in contrast to the application of this local name to *Artemesia vulgaris* in the "Dravidian" languages other than Kannada. *Artemesia pallens* was introduced into our country just a century ago, and its charming outlandish fragrance won the admiration of our people. Here is one more instance of the application of an old familiar name to a new entrant, a situation similar to the case of *eranda* mentioned on a previous page!

Ocimum sanctum L.

An inscription of the Hoysala king Viraballāla incised in 1185 A.D. mentions of a grant given for constructing a *tulasī brndāvana* (a brick and mortar or stone platform for growing *Ocimum sanctum*) on the banks of the river Tungabhadra (EC. VI. Ck. 78). Another Hoysala epigraph executed in the region of king Viranarasimha says that a woman by name Mañciyakka gave money to the *śrīvaiṣṇavas* of Vijayasimhapura who caused the erection of *brndāvanas*. A provision was made in the year 1414 A.D. of garland made of *tulasī* leaves to the Lord of Siṃhācala (347 of 1899).

The *tulasī* plant has been sacred to *Vaiṣṇavites*, *śrīvaiṣṇavites* and *Smārtas* as an object of worship; it has also entered into their rituals. The plant is specially sacred to the *Śrīvaiṣṇavites* and to the followers of the Kṛṣṇa cult. The epigraphs prior to the 12th century do not mention this plant. Although the medicinal properties of this plant have been referred to in the late Medieval texts, the herb was not known to the earlier herbalists. *Carakas surasa* has been equated with *tulasī*, but the identification is not satisfactory.

Under these circumstances is it not likely that *Ocimum sanctum* was unknown to our soil prior to the 10th/11th centuries ?

It is true that Linnaeus chose the specific epithet *sanctum*, obviously on the basis of information supplied to him by the Herbarium vouchers or by correspondents. And it is quite possible that this information could have reached him from India. It should not be forgotten that Linnaeus lived in the 18th century by which time legends and myths on *tulasī* had already become stabilized.

The sacred basil in India has never been found as a component of our indigenous vegetation. We see it grow always in human settlements, in *vaiṣṇavite* temple precincts, in homes and in gardens. Rarely it escapes cultivation.

The northern coastal belt of the Mediterranean is the native home of the holy basil, where it grows as a weed. As the coastal trade between this area and the Far East increased, the weed seed should have reached India as a contaminer in merchandise and must have thus become colonized on our soil. Because of the agreeable mild fragrance of the herb it should have come under cultivation. This could have happened sometime in the 10th/11th centuries. It was about this time that *śaivism* was undergoing a resurgence in South India and during the process acquired and adopted several indigenous customs and practices, which involved some of the South Indian plants. That tender coconut-milk was one such innovation has been mentioned on a previous page. The choice of *bilva* leaves (*Aegle marmelos*) looking like Lord Śiva's weapon and thereby His symbol was yet another; the leaf was also considered as an offering dear to Śiva. Eventually legends evolved identifying the *bilva* leaf with the three-eyes of the Lord. On the *vaiṣṇavite* side, for some unknown reason, the *tulasī* plant was chosen as the symbol of Lord Viṣṇu; the beads carved out of its slender stem attained sanctity. Viṣṇu having become syncretized with an aspect of Kṛṣṇa, acquired epithets like *tulasī-manimālā*, *tulasīvanamālī* etc., particularly after the composition of the *Bhāgavata*. Eventually the plant itself was identified with Lord Kṛṣṇa, giving rise to the actual workshop of the plant itself! Is this not one of the clear instances of Hindu religion having digested into their cult a foreign plant introduced into India sometime during the 10th/11th centuries of the Christian era ?

Two varieties are traditionally recognized in the holy basil—one that is green all through (*śrītulasī*) and the other that is reddish (*kṛṣṇatulasī*). Both, however, belong to the same botanical species.

Lord Kṛṣṇa is given the epithet '*atasīkusumagātra*' ('who is of the size of an *atasī* flower'). What could be the *atasī* flower? Although this term has come into use in Sanskrit, its usage cannot be traced backwards of a couple of centuries. Modern lexicons equate the name with *Linum usitatissimum* (flax) or rarely with *Sesbania grandiflora*. It is unfortunate that neither of these are indigenous plants in India, both having been introduced for commercial purposes in the late 19th century. The usage of the phrase, however, is older by a few centuries and as

such the conceiver of the comparison could not have drawn inspiration from either of the above plants.

It is just a coincidence that the colour of the flax flower is a most attractive blue, the shade traditionally attributed to Lord Kṛṣṇa's body. Yet because of the recent history of this plant in India, the plant in question has to be one which was familiar to the poets of still earlier days. Could the plant be *tulasī* itself? After this plant became involved in our religion; after it was identified with Kṛṣṇa Himself, after the stories concerning the child/boy Kṛṣṇa came to be well established, is it not likely that the *tulasī* flower itself was chosen for comparison with the intention of either perpetuating the freshness of Kṛṣṇa's childhood or implying that His was a *sūkṣma-bāriṇa*—as minute as the flower of *tulasī*?

Look at the names for flax and holy basil used in the Indian languages :

Language	flax	holy basil
Hindi	<i>alsi, tisi</i>	<i>tulsī, tulasī</i>
Bengali	<i>tisi, masina</i>	<i>talsī, tulsī</i>
Behari	<i>tisi, cikna</i>	—
Kashmiri	<i>aliṣ</i>	—
Punjabi	<i>aliṣ, alsi, tisi</i>	<i>tulsī</i>
Marathi	<i>alsi</i>	<i>tulasī</i>
Gujarati	<i>alisi</i>	<i>tulsī</i>
Telugu	<i>atasī</i>	<i>tulasī</i>
Kannada	<i>alsi, alṣi</i>	<i>tulasī, tulaṣī</i>
Tamil	—	<i>tolaṣī</i>

Could it not be likely that the terms *tisi*, *alsi* of flax suffered phonetic mix-up in popular usage with *tulsī* of holy basil as a result of which the modern scholars tend to look upon *atasī* as a term denoting flax? Is it not a simple phenomenon that the root of the first consonant (*t*) in *tulasī* got dropped out so that the residual word stands as *alsi*, sounding similar to the name of flax?

Ficus religiosa L.

There is no doubt that this taxon is indigenous in the foot-hill region of the Himalayas. But its modern presence throughout the length and breadth of India calls for an explanation. *Aśvattha* has been looked upon as a sacred tree by the Hindus as well as the Buddhists and its cult has become closely knit with our culture. To the Vedic people the tree was a symbol of the universe and later religious literature of the Hindus elaborated the theme. This was the tree under the shade of which the Lord Buddha is believed to have become enlightened, as a result of which the object acquired the status of the Buddhistic symbol.

It is a well known fact that Buddhism originated in the same locale as the nativity of *Ficus religiosa* and that the *bhikṣus* spread the tenets of the religion in all directions. The sculptural friezes in ancient *stūpas* (Sanchi, Bodh-Gaya,

Barhut, etc.) clearly depict the tree (sapling or branch) being taken in procession by *bhikṣus*. These stand testimony to the fact that they dissiminated the propagation and spread of the *āsvattha* tree along their direction of migration. Just as this has happened from the Himalayas to Kanyakumari (Cape Comorin) at the southernmost point in India and farther south in Ceylon, so also along the Malay archipelago (*JAA*XXVII. p. 328).

The present habit of *āsvattha* in South India clearly testifies to the human agency involved in the distribution of the species. The plant grows along roadsides, near human settlements, temples and as deliberately cultivated specimens, but never as a component of the natural vegetation. As the reverence of the Hindus towards the plant is older than that of the Buddhists, the taxon was subjected to further spread and density. No wonder that such a sacred plant finds mention in epigraphy. An inscription of the time of Bukka (Vijayanagar dynasty) records the pious acts of one Bhaṭṭara Bakkappa amongst which was the planting of *āsvattha* along the four directions and causing the performance of *upanayanam* ('sacred thread ceremony') to the trees (*EC*. III. Ml. 22, 1358 A.D.). Musaliseṭṭi caused the digging of a well in Nandikotkur and the erection of platforms to the *āsvattha* trees that were growing nearby (21 of 1942/3).

The worship of the *āsvattha* trees by the Buddhists is a very old practice; numerous sculptural representations are available from the beginning of the Christian era, where we see the devotees decorating the tree with floral garlands, flags and other such items (Ferguson 1880). Such a custom could have been in vogue in South India as long as Buddhism was a live factor, perhaps till the 8th century A.D. With the decline of this religion it appears likely that Hinduism took over the custom and modified the ritual to make it appear Hindu. The worship of the *āsvattha* tree by celebrating *upanayana* and marriage ceremonies are customs that are prevalent even today in South India. Further studies are needed to confirm the origin of the Hindu practices of worship during the Medieval period.

Aegle marmelos Corr.

This natural component of our vegetation has been looked upon as an object of sanctity by the *śaivites* all over India from ancient times. The plant was also known to the earliest writers of the Hindu medicinal compedia. The Medieval *āgamic* texts declare that the Śiva-*linga* carved out of the wood of this tree possesses special sanctity, apart from its leaves being especially dear to the Lord. The local names of the plants are all cognatic forms:

Hindi	— <i>bel, śriphal, siriphal</i>
Assami	— <i>bel</i>
Bengali	— <i>bel, bela, vilva</i>
Marati, Gujarati	— <i>bela, bil, bela</i>
Sindhi, Punjabi	— <i>bil, kaṭori</i>
Tamil	— <i>viloam, kuvilam</i>

Telugu	— <i>bilva</i>
Malayalam	— <i>kuvilam</i>
Kannada	— <i>vilva, bilva</i>
Sinhalese	— <i>belli</i>
Sanskrit	— <i>bilva, śrīphala</i>

It is difficult to ascertain the period of establishment of the connection of the tree with Lord Śiva. As there are profuse references to this situation in the literatures of the "Dravidian" languages of the Medieval period, it is likely that the tradition evolved in South India. When the *āgamic Śaivism* was gaining ground during the 11th to the 13th centuries in the peninsular India, it appears to have absorbed several local traditions, practices and cultural elements at the practical and ritualistic levels. As a result, the content and size of the *āgamas* expanded by the addition of interpolations. It could be at such a juncture that the three-pronged weapon and the 'three eyes' of Śiva found symbolization in the tripartite leaf of the *bilva* tree. My personal view is that this concept was formulated during 10th/11th centuries. A Chalukya inscription of the 11th century states that a priest by name Padma-Śiva erected a temple for Nāgeśvara and granted a piece of land to one Savanta-Ramayya who provided the *bilva* leaves required for worship in the temple (*EC. VII. Hn. 14, 1076 A.D.*). There is a record of the 12th century informing of the provision made for the supply of 1000 *bilva* leaves to the temple of Puṣpanāthasvāmi, Nerur, Tiruchi District (21-I of Rangacharya).

Nymphaea pubescens Willd, *N. stellata* Willd and *Nelumbium speciosum* Willd.

There was no clear species distinction amongst these taxa in the mind of our ancestors and they used words like *kamala*, *tavare*, *pañkaja* and a host of others to include all the three taxa mentioned above. The only features that contributed to the universal appeal of the flowers appear to be the large size and numerous tepals. The Hindus, the Buddhists and the Jains accepted the flower for their own reasons. The flower conveyed a special significance to the *yogis* and *tāntriks*; it became the seat of Brahma and of all deities of religions prevalent in India; sophisticated Gods desired it as also the folk deities; Sarasvati and Lakṣmī implanted themselves firmly on the flower and refuse to step down! For all female deities, the lotus bud or flower became a must symbol in one of Her hands according to *śilpa* texts.

The poet has drawn similies from the leaf, flower, tepal and the stalk; and numerous poetic conventions (*alañkāra*) have been established. The devotee is the bee always feeding on the lotus pollen. The *yogī* sees only lotus flowers deposited at all cardinal points of the human body. To the sculptor, painter and craftsman it has provided an unending series of decorative motifs. We witness these endeavours continuously for over 2000 years in literature and sculpture.

The epigraphs provide yet another facet of the lotus story. Land was donated for the exclusive cultivation of lotus (506 of 1906); and a special canal was dug

to supply water for the cultivation of this crop (304 of 1960/1 ; 39 of 1927). A royal order was proclaimed reserving a pond for growing water-lily, the flowers raised therefrom to be used for the worship of God Viśveśvara in *Vidivitan̄kacaturvedimaṅgalam*. When an objection was raised from the public that such an act would deprive the cultivation of other crops, the proclamation was modified to the effect that water from the said pond would be available for other crops only on specific days of the week (179 of 1925).

It was a common practice in those days to show exemption from taxes for the cultivators of lotus crop (346 of 1927) ; occasionally the growers were paid in gold (563 of 1904, 1122 A.D.).

Making garlands of lotus flowers and supplying them to the temples appear to have been a profession in the Medieval period (387 of 1905 ; 64 of 1913). The public of the place also sometimes shouldered the responsibility of the supply (140 of 1926). It is recorded that one Koneriraya caused the digging of a tank for growing lotus exclusively (201 of 1940/1).

We can obtain an idea of the quantity of lotus flowers daily required in temples :

<i>Name of the temple</i>	<i>Number of flowers</i>	<i>Epigraphic reference</i>
<i>Āpatsahāyēśvara, Palanam</i>	100	175 of 1927/8, 1227 A.D.
<i>Naṭarāja, Chidambaram</i>	200	284 of 1913, 1217 A.D.
<i>Arunācaleśvara, Tiruvannāmalai</i>	600	100 SITI, 1361 A.D.
<i>Anatīśvara, Udaiyargudi</i>	1000	625 of 1920, 1020 A.D.
<i>Nāganātha, Mānambāḍi</i>	2000	95 of 1931/2

Many epigraphs inform us the practice of decorating the houses with lotus flowers. An order was passed permitting this practice for the houses in which the temple servants lived (136 of 1905). In the Medieval South India two caste factions—'Left-hand' and 'Right-hand'—became turbulent and quarrels between them were quite frequent. The right of holding a white umbrella, the order of priority of receiving temple honours, the right of using a palanquin, the right of entering certain streets in a town, etc., were matters of dispute between the two groups. So also was the case of decorating the house-front with lotus flowers. The factions went to the extent of claiming this practice as a right after paying a tax specially levied for the purpose (216 of 1917).

Leucus aspera Spr.

The intimate association of this flower with Lord Śiva is at least a 1000 years old. The three *śaivite* composers (*Appa, Sambanda, Sundara*) of Tamil Nadu who lived in the late 10th century A.D. speak of this flower as being dear to the Lord. One *nāli* (a measure) of the flowers was being supplied daily for Kṣīranāthasvāmi temple (508 of 1926). One handful of flowers was being sold at 1 *kāṣu* (336 of 1927).

An endowment in gold had been instituted for providing a specific quantity of flowers to Lord Mahādeva of Tirukkalivallam on every 12 *saṃkrānti* days of the year (226 of 1921).

B. *On some plant products*

Candana (*Santalum album* L.)

One of the alternative names for this plant in Sanskrit is *malayaja* ('born in the montane region'). There appears to be some confusion caused by accepting this term as referring to the Malay States (Malaya), as a result of which doubts have been expressed as to the nativity of the plant—whether it is not of Malayan origin. It must, however, be remembered that Sanskritists used the word *malaya* to refer to some parts of the foot-hills of the Western Ghats and that the plant in question occurs in the wild condition on the eastern side of the Ghats. Thus it is clear that sandal is an indigenous component of South Indian flora.

According to Gode (1961), sandal finds mention in the *Mahābhāṣya* of Patañjali (150 B.C.). Thence onwards there is frequent reference to the plant or to its fragrant product in literature written during the following centuries.

Candana (sandal paste) found increasing use in South Indian temples after the 10th century. Apart from routine uses, it was particularly needed for the ceremonies *tiruccāndu* (384 of 1921) and *merpurccu* (160 of 1906) during which huge quantities of the product were consumed for anointing the deity's image. It was also one of the fragrant articles to be mixed with water which was in turn used for the sacred bath (*sānapana*) of the images (160 of 1906 ; 300 of 1919). There are instances of endowing money (134 of 1915) or land (682 of 1916) for the exclusive purpose of buying the required quantity of sandal paste. There is an epigraph on the rubbing-stone itself preserved in the temple of Śrīśailam (45 of 1915) mentioning that it was given as a gift for preparing the sandal paste.

Karpūra (*Cinnamomum camphora* Nees.)

The tree yielding this product is indigenous to China and Japan. It has been of late introduced as an experimental measure in some parts of Malabar and the Nilgiris. In other words, at no time in history the plant was known to be under cultivation in India, but its product, the *karpūra*, was known to our ancestors from the late part of the first millennium A.D. Although it appears probable that the medicinal uses of the product had been known during still older periods, the earliest epigraphic record belongs to the 11th/12th century (442 of 1954/55) ; it mentions a variety of camphor called *bhīmaseni*.

In temples, the camphor was one of the articles mixed with *candana* for anointing purposes (442 of 1954/5). It was also required in daily ritualistic worship of the deity (160 of 1906 ; 112 of 1939/40 ; etc.). There is *āgamic* sanction for burning camphor in front of the consecrated deity. It should not be forgotten that

the *āgamas* were not written at any specific period ; initially they were of smaller magnitude in content and variety, gradually incorporating newer elements and elaborations. Under these circumstances it is not possible to ascertain the time of origin of the custom.

Attention has already been drawn to the existence of coastal trade prior to the 10th century A.D., involving China and the coasts of India. Camphor reached India through this route and at first found use as an article in perfumery. Its sublimating character when brought in contact with flame must have triggered off the discovery of a new significance to the phenomenon. The philosophers and theologicians found ready comparison for the process in the dissolution and re-absorption of the *ātman* in the *parabrahman*. The burning of camphor in front of God was interpreted as an expression of total self-surrender where the 'self' disappears. The story of the camphor is thus yet another instance illustrating the absorption and digestion of a wholly foreign element into the life and blood of our religion and culture.

Kesari (*Crocus sativus* L.)

This plant is a native of Kashmir and is never cultivated in South India. I have come across only a single inscriptional record of the 13th or 14th century A.D. The epigraph mentions this product (filaments of stamens) among other fragrant articles that were used in temple rituals (160 of 1906). This record is of a Pāṇḍya king by name Virapāṇḍya. There are three rulers of this name in the Medieval Pāṇḍya dynasty who reigned during periods as mentioned below :

1253-1274/5

1296-1340

1335-1352

It is not possible at present to identify the donor of the grant. However, there are reasons to believe that saffron had been known in South India two or three centuries earlier. The available historical evidence points towards a southward migration of the Kashmir people in the middle of the 10th century. The exodus involved scholars, philosophers, followers of the *pratyabhignā* and *brāhmanical* religions, traders, etc. It is possible that saffron could have been introduced by them into South India.

Panniru ('Rose water')

A reference to this article is found in the same inscription mentioned under *keśari*. The word is also recorded in an epigraph of Ganapatideva in his Motupalli pillar grant, executed in 1244/5 A.D.

Our contemporary understanding of *panmir* is that it is a distilled product of rose flowers (although the contemporary 'rose water' is nothing but the distilled waste of the leaves of *Geranium* !). Persian chronicles record that on the occasion of the marriage of the Mughal emperor Jahangir with Nur-Jahan, a canal in the

palace was flooded with rose water and that Nur-Jahan noticed that an exceedingly fragrant oily scum floating on it; she called it *attar-Jahangiri*. This incident cannot be dispensed away as an imaginative story. The rose plants, the flowers of which yielded the sweet smelling substance, were introduced into our country by the Mughals themselves. They also imported trained gardeners from Iran and Turan. The process of extraction of the essence is also their discovery. The marriage of Jahangir and Nur-Jahan took place in 1612 A.D., which means that the articles rose *pannīr* and *attar* have come to be known in India only from the middle of the 17th century.

Then, what could be the *pannīr* which is mentioned in South Indian inscriptions of the 13th/14th centuries? The term always occurs along with articles of fragrance—sandal paste, camphor, incense, fragrant floral dust, etc., and therefore we are not wrong in presuming that *pannīr* should also belong to the same category of products. Even today *pannīr* is sweet smelling irrespective of the mother plant used for extraction. However, this cannot be the *pannīr* of the centuries prior to the 17th.

The derivation of the word *pannīr* poses a problem for the Linguist too. The word does not find entry in old Sanskrit lexicons. Could it be that one has to look for its origin in a combination of Sanskrit and "Dravidian" languages? Is it possible that '*parimalada nīr*' ('fragrant + water') could have become abbreviated as *pannīr*?

C. "Spring festival" (*vasantotsava*)

There is ample evidence to demonstrate that the respective temples were the centres of intense activity for *śaivism* and *vaiṣṇavism* in South India. The public functions of religious import evolved within the organizational orbit of these institutions. Studies of Chidanandamurthy (1966) have dealt with some of these festivals.

The celebration of *banada hunnime* ('the full-moon day in forest') to the goddess Bana-śaṅkarī is mentioned in *EI*. V. No. 3A, A.D. 1161. The first word in the name of the goddess means 'forest' while the second, 'the consort of Śaṅkara (Śiva)'. On the day of the festival the decorated deity is taken in procession with full paraphernalia to a nearby forest or grove where She would be seated in splendour; by night the deity is brought back to the temple, again in full procession. This is a festival which is in vogue to this day in several parts of South India. Apart from creating an opportunity for the public to take part in the festival, there is also the belief that the safety and protection of plant life in the forest is ensured by the arrival of the goddess to the spot.

Another ceremony connected with vegetation was called *tiruvettai* ('the sacred hunting'). An inscription of the Cola king Rājarāja II mentions that a land was granted by the assembly of Nāṅgūr for Lord Sundarēvara (11 of 1925, 1178 A.D.), for the purpose of conducting this festival. On such occasions, the deity (Śiva)

was decorated as a hunter and was taken in procession to a nearby wooded area, where a nock hunt was enacted, in which the Lord became victorious by killing a beast or a demon.

Planting a grove of trees for the conduct of such festivals in the neighbourhood of towns and villages, appointing watchmen to look after the property and donating 2 *mā* of land as their remuneration find mention in an inscription of a Pāṇḍya king (461 of 1916). These public festivals in temples greatly increased in popularity and frequency during the Vijayanagar period. A Virayya-dannayaka made a bequest for conducting a festival of the kind in Sūryanārāna-grove (213 of 1926, 1511 A.D.); for a festival that was conducted in the spring, a separate grove by name *vasanta-topu* was reserved (509 of 1919, 1551 A.D.). There are numerous inscriptions recording such donations.

There is no mention of the kinds of plants that were planted in such groves. We can come across such old groves even today in or near villages and small townships which are remotely situated from urban centres. Some of the groves contain trees that were planted some 200 to 300 years ago. The most common components are—*Mangifera indica*, *Bassia latifolia*, *Tamarindus indicus*; less frequently *Artocarpus integrifolia*, *Calophyllum inophyllum*, *Mimusops elengi*. These are trees not only giving cool shade for a major part of the year, but also the ones which contribute towards balancing the economy of the temple through fruits and flowers.

D. Food-offering

A chieftain by name Vijaya-Gandagopala donated the village Ambikapura for “providing food that resembled the celestial honey (*amṛta*) and at the same time suited the individual tastes of eight *brāhmaṇas* daily” (*EI*. XIII. No. 16, 1291/2 A.D.). While such is the qualifying epithet for food that was served to mortals, one has only to imagine the quality of dishes prepared as offerings to Gods! A much worn out epigraph of 1927 bearing the number 127 mentions the names of 10 dishes that were dear to Lord Śiva. Unfortunately there is no way of knowing further details.

The Ambāsamudram inscription of Varagunapāṇḍya (9th century A.D.) lists a menu of attractive items—*pulikari*, *pulukku kari*, *porikkari*, *kummayam*—which constituted the food-offering to God (*EI*. IX. No. 10). The Tirumukkudal inscription of the Cola king Vira-rājendra (*EI*. XXI. No. 38, 11th century A.D.) adds another item called *milaku kari*. From the epigraphs of the 16th century Vijayanagar rulers we obtain an enlarged list of food preparations—*kaik-kari*, *kariyamudu*, *vaiccamudu*, *neyyamudu*, *kuttu*, *morukkolambu*, *paccadi*, *puliyorai*, *kadugorai*, *ponkal* (*pongal*), *appam*, *veduporiappam*, *vadai*, *iddali*, *sukiyan*, *dadhya-dana*, etc. (*SITI* 405, 372, 370, 369, 368, 357, etc.).

Some of these dishes have become obsolete today; few others have undergone change of ingredients; yet others have continued to today with little or no change.

The inscription of Virarājendra and of the Vijayanagar rulers list the ingredients of some items of the cuisine :

(1) *raik-kari*—We learn from an epigraph of the Cola king Rājarāja I (*SII*. II. No. 26) that this was a preparation containing black pepper, mustard, salt, vegetables and that a sub-variety of the dish, *appak-kaiik-kari*, containing old rice, gram, black pepper, mustard, cumin, (country) sugar and ghee.

(2) *pulikari*—Constituents were black pepper, mustard, (country) sugar,? tamarind, curd, horse-gram, banana (*SII*. II. No. 26).

(3) *pulukuk-kari*—A preparation involving the boiling of the ingredients, the essential component appears to have been gree-gram pulse in olden days. Red-gram (*Cajanus cajan*) is generally substituted today.

(4) *porik-kari*—This was a dish fried in ghee ; the ingredients were black pepper, mustard, black-gram, cumin, ?methi, turmeric, ginger, salt, ?tamarind and vegetables.

(5) *veiccamudu*—This appears to be a baked or steamed dish made of rice, green-gram and jaggery.

(6) *āppam*—Constituents are rice, ghee, jaggery, black pepper, cumin, asafoetida ; another variety called *vedūpori-āppam* also finds mention.

(7) *dadhiodana*—Constituents of this preparation in the time of Venkaṭapātirāya of Vijayanagar were rice, curd, ghee, ginger, cardamom.

(8) *kariyamudu*—The major ingredients of this preparation were vegetables—brinjal, green plantain, bitter gourd, cucumber, garnished with black pepper, ghee and cumin.

(9) *bukiyan*—The ingredients recorded are rice, green-gram, jaggery, ghee and black pepper. Today the second item is substituted with red-gram and the last item dropped out. It is a dish that is specially reserved for *brāddha* rituals among South Indian *brāhmanas*. They have also innovated the practice of spicing the preparation with cardamom and *paccai-karpūram*, a product of *Dryobalanopsis*.

(10) *pānaka*—A sweetened drink obtained from mixing jaggery, cardamom, banana, coconut milk and parched rice in water.

(11) *kummayam*—This is a preparation which finds mention in Varagunapāndya's epigraph (9th century A.D.). Today it is rare and endemic in traditional families of *cettiars* of Ramanathapuram district, Tamil Nadu. The ingredients are, I learn, broken green-gram and jaggery.

Inscriptions such as these need deeper and intensive study and analysis. The random data presented above is clear enough indication of the types of plant products and vegetables that were consumed as food prior to the 16th century in South India. We learn, for example, that black pepper and ginger were the only source for the 'hot' taste in the absence of the modern red chilli ; that jaggery was pre-

ferred for all sweet preparations and sometimes the 'country sugar'; that the sugar of the modern parlance, which was then an imported stuff, was either not easily procurable or was under a taboo for religious purposes. It is interesting to note that the use of mill-made sugar for dishes on *brāddha* ceremonies is prohibited even to this day. We also gather that the most commonly used vegetables were the green plantain, bitter gourd, indigenous variety of brinjal and cucumber. Coriander, which is a common flavouring and garnishing article in the kitchen of today is significantly absent in the old time cuisine.

The ever changing times and tastes are clearly reflected in our food habit. The Medieval epigraphs speak of a *madappalli* (kitchen) located within the temple precincts, especially in connection with *Śrivaishṇavite* temples. It was in this place that the dishes for food offering to the deity were prepared. After the offering ritual was over, the eatables were distributed to the devotees and the staff of the temple, a custom that is still being followed in a few temples. In modern times the residual food is sold to the devotees and in many temples the organization of the *madappalli* is being run on the same line as a hotel or restaurant. Some years ago when I happened to visit some of the ancient temples, the *madappallis* of which we find mention in the epigraphs of the Medieval period, I was surprised to find that eatables of olden times had disappeared from the menu and items like *mysore-pak*, *jāṅgiri*, *bombay-hālva*, *cūda*, *masālā-dosai*, etc., were being offered for sale; coffee and tea were also available in keeping with the discerning palate of today!

Although a thorough study of epigraphic materials supply some decisive information regarding the food and food-habit of our ancestors, —and more often in the form of negations—much recondite information is yet to be recovered from the old *sūpa*- or *pāka-bāstra* texts, which contain more positive data. This study is yet to be undertaken by interested students of botany and the epigraphic and literary data harmonized.

TOTEM PLANTS

In old Tamil literature we see a special significance to the tree and flowers and *bāge* (*Albizzia lebeck*). The tree was believed to be the abode of the goddess Durgā (*Manimekalai*, VI. 80-9). The victorious kings and soldiers wore a chaplet of *bāge* flowers, in the belief that the victory was the grace of Durgā. The kings of the Cera (Kerala) land used these flowers along with those of *Pandanus* for a similar purpose (Padiruppattu, 66).

Before starting a war, the soldiers worshipped Durgā with the flowers of *veṭci* (*Ixora coccinia*) and decorated themselves with the same flowers (*Śilappadikaram-veṭṭuvāvari*). The enemies who were occupied wore the flowers of *karanda* (*Sphaeranthus indicus*) and prepared themselves for counter attack. When a king started on his war path, he wore a garland of *vañji* (*Bassia latifolia*) flowers and the enemy king of *kāñji* (*Thespesia populnea*) flowers. The soldiers who were about to occupy

a fort wore the *ulingai* creeper (*Cardiospermum halicacabum*) and the occupied, the flowers of *nocci* (*Vitex negundo*) (Purananuru, 50). The Pāṇḍya king Nedunjeliyan wore a garland of *Cardiospermum halicacabum* and *neem* after becoming victorious in the battle of Talaiyalanganam (Purananuru, 77).

From literary sources such as these one is led to believe that certain plants or plant parts were chosen as totemic symbols by certain ruling houses in South India. We learn, again from the same sources, that *atti* (*Ficus glomerata*) fig was the totem of the Colas while it was the *Pandanus* flower for the Ceras. We also learn wearing of the totemic flowers was raised to the level of a ritual. It is said that Nedunjeliyan had a ceremonial bath before he decorated himself with the *neem* leaves (Purananura, 79).

The poets have attributed similar practices to Gods as well. Lord Śiva wore a garland of *Cardiospermum* when he was engaged in the destruction of the 'Three Cities' (Purapporul venbamalai, 102). Virabhadra is said to have worn a garland of tender mango leaves and proceeded to destroy the Sacrifice of Dakṣa !

The inscriptions clearly mirror such practices. Taḍaṅgāla Mādhava, one of the early Ganga kings, wore a chaplet of *karnikara* (*Stereospermum* sp.) (EC. VII. Shikaripur 52, ?357 A.D.). A *kadamba* (*Anthocephalus cadamba*) tree was growing in the house precinct of the ancestors of Kakutsavarman; they tended and nurtured it and referred to their dynasty by the name of the tree itself (EC. VII. Shikaripur 176, c. 450 A.D.). That the *kadamba* tree sprouted out of a sweat drop fallen from the body of Lord Śiva is mentioned in a 12th century *kadamba* inscription (EC. VII. Shikaripur 117, 1118 A.D.).

FUEL, STOVE

Before the discovery of the match stick, it was the practice all over the world to kindle fire either by flinting stone or by churning dry wooden sticks. This is the method that is still being followed by tribal folks in several parts of the earth. That the kindling of fire for ritualistic purposes should be accomplished by the use of churning sticks is prescribed in Vedic and *śāstric* literature. The *āgamas* also echo the same method in reference to the rituals in the temples. Furthermore, there was need to maintain live fire all the time in temples and hospitals; the *brāhmaṇa* was to worship fire daily and keep it alive all the time in his home. Thus there were a few centres in each human settlement which obviously supplied fire for the use of the community.

When once the fire is kindled, provision had to be made to maintain the same. A 10th century record mentions the gift of a land for a person whose responsibility was to supply fuel to the stove that was kept alive in a temple (EI. XXV. No. 6). Six *gadyāna* of land was made over to the assembly of Śivapura-agrahāra and the revenue realized therefrom was to be used for maintaining perpetual fire (EI. XII. p. 273, 1080 A.D.). "Unlimited *punya* (reward) to the protectors of the stove.

“*Agnaye namaḥ*” is a part of an epigraph (*EC. VII. Sk 74, 1010 A.D.*). At the time of making a bequest for educational purpose, a part of it is scheduled for a *brāhmaṇa* for maintaining fire (*SII. IX. i. No. 175, 1107 A.D.*). That fire-stoves were maintained in some monasteries (*maṭha*) is learnt from *EC. III. Tn. 129, 1136 A.D.*

It is surprising that none of the available epigraphs name the species of fire-sticks that were used for kindling the fire or of the species the wood which was fed as fuel during maintenance of the stove. The *gṛhya* and *śrauta* canons prescribe two separate woods, —one to serve as the bottom piece (*adhara*) and the other as the churning stick (*uttara*); the measurements of the *araṇis*, as the sticks are called, are also given. The *araṇi* was made of *Ficus religiosa* (*Rg. Veda*). The *Nāmbudiris* of Malabar adopt this method even today in connection with the rituals of *āditripād*; during marriage rituals they use the woods of *palāśa* (*Butea frondosa*) and *udumbara* (*Ficus glomerata*). Both these species are easily available from the flora of Kerala. Is it probable that these were the very woods that served the same purpose in ancient days also ?

The tribal communities in South India very largely resort to fire-making by the churning method. The sticks used are obtained from :

<i>Tribal communities</i>	<i>Churning sticks</i>
Travancore, Malabar :	
<i>kaṇikar</i>	<i>Grewia tiliaefolia</i>
<i>nāyaḍi</i>	<i>Litsaea sebifera</i>
<i>pāṇiyar</i>	<i>Bambusa</i> sp.
Tamil Nadu :	
<i>kāḍar</i>	<i>Bombax malabaricum</i>
<i>Toḍa</i>	<i>Litsaea zeylanica</i>
	<i>Michelia niligirica</i>
	<i>Eleagnus latifolia</i>
	<i>Cinnamomum wightii</i>
	<i>Dodonaea viscosa</i>
	<i>Olea robusta</i>
<i>irula</i>	<i>Aeschynomene aspera</i>
<i>baḍaga</i>	<i>Rhodomyrtus tomentosus</i> (<i>uttarāraṇi</i>)
	<i>Dalbergia velutina</i> (<i>adharāraṇi</i>)
<i>koṭa</i>	<i>Rhodomyrtus tomentosus</i>
	<i>Salix tetrasperma</i>
Andhra Pradesh :	
	<i>Protium caudatum</i>
	<i>Bauhinia racemosa</i>
	<i>Cordia monoica</i>
	<i>Ficus</i> sp.

From the angle of utility the *baḍaga* method is better suited: *Rhodomyrtus* is a lighter wood than *Dalbergia* as a result of which the basal piece (*adhara*) lasts longer at the same time affording better resistance in the operation. The largest number of woods in the above list are relatively light and as such are capable of producing fire easily. The woods used by the respective tribal communities are those that inhabit the forest areas in which the folks live. The tribals knew by experience that all woods, when dry, are latent producers of fire; they also knew that lighter the wood, the easier and quicker is the churning process. Is it far wrong to presume that people elsewhere were also guided by the same experience and resorted to woods that were growing in their habitat?

POETIC EMBELLISHMENT

Of the script-writers of the epigraphs, many were poets of no mean order. A study of the inscriptions written in verse form convey this impression. On some occasions the epigraphs provide genuine poetry.

Comparing the donor to the mythological *kalpaka* tree (*EI. XIX. No. 38, 1179 A.D.*), the *pārijāta* tree (*EI. III. No. 34, 1634 A.D.*) or the *nandana* tree (*EI. VI. No. 36, ? 1115 A.D.*) is a common convention. While describing the valorous exploits of Vikramaditya it is said that he was fire to the cotton, that is his enemies (*EI. V. No. 16 D, 918-25 A.D.*). The enemies of a brave man become weak as banana stem (*EI. IV. No. 33, 1202 A.D.*). "Oh! the brave one of the battles! It is a lie to declare that there are no robbers in your kingdom when your own body has robbed off the colour of the *campaka* flower!" (*EI. IV. No. 18*). The sage Meghacandra shone as the rhizome of banana (*bilasat kandalikāṇḍakāntam—EI. VI. No. 4, 860 A.D.*). The fame of the teacher Ajitasena competed with that of the jasmin flower! (*EI. III. No. 26, 1129 A.D.*).

Chalukya Pulakesi was as strong as an elephant in rut; that he destroyed innumerable *kadamba* trees is described in highly rhetorical phase—*nṛpati gandha-gajena mahaujasāprthukadambakadambakam* (*EI. VI. No. 1, 634 A.D.*).

Poetic diction and idiom is maintained in descriptions dealing with deities. The neck of Lord Śiva was like a white lotus encircled by bees (*EI. III. No. 43, 1081-3 A.D.*). The canine tooth of Boar-Viṣṇu resembled the male inflorescence of *ketakī* (*Pandanus*) (*EI. XII. No. 14*). The devotee was like a bee covered with the pollen in the lotus-feet of Maheśvara (*EI. IX. No. 49, 1111 A.D.*).

Plants have been drawn into comparison while speaking of certain eternal truths. A 7th century epigraph of the time of the Kalacuri king Śilāditya declares that youth withers away as the flower of *śirīṣa* and that the royal glory is blown off as the leaves of *aśvattha* in wind (*CII. IV. No. 29, 693 A.D.*). The evanescent nature of health and wealth find similes in the slipping away of water drops from a lotus leaf (*EI. XII. No. 31, 1026 A.D.*).

PLANTS AND PROFESSION

With the increased intensity of agriculture, with the introduction of newer varieties of crops for cultivation, with the growing intuitive desire to domesticate plants for man's use, with the evolution of implements for tree-felling, lumber sawing and wood working and with the continuous introduction of useful exotic plants, man's relation with plants became inseparable from his daily life to the extent of bringing about a social change. A major result was the division of labour in the community, an inevitable consequence of the diverse uses to which the plants or their parts were subjected. That agriculture was a major occupation in ancient times is already referred to. The fact that the farmers, as a group, came to be recognized as an integral part of a community—and a very important one too—gave them an exclusive social status and professional distinction. Occupation with plants in reference to their exploitation caused further diversification of occupations/professions as a result of which an externally homogeneous society internally included occupational heterogeneity. To what extent these factors were responsible for the creation of new castes is another problem. But that intensive occupation with plants did bring about a social change appears to be a historical fact.

This aspect of study needs much more elaborate scrutiny of epigraphic materials. It was not possible for me to devote the required time and energy at present owing to other professional pre-occupations. Therefore I am obliged to present only a rather casual account.

The growing popularity of the *tāmbula* caused the recognition of a profession of dealers in the concerned commodities—betel leaf and areca. We see that a trade guild of *tambuliḡas* (dealers in *tāmbula*) was already in existence in the late 10th century. The Rāṣṭrakuta king Kṛṣṇa had levied that the *tambuliḡas* should pay a tax of two *pana* and one *adda*, which was not resented by the traders. The Chalukyas, who followed, increased the tax and the *tambuliḡas* complained to the then ruler Āhavamalla, who in turn, restored the old rate (*SII. IX. i. 76, 991 A.D.*). It is possible that the kings had in their domestic employment a special category of maids whose daily duty 'of maids whose daily duty was to serve *tāmbula* (*tāmbula karankavāhinī*).

With the institution of temple gardens, the employment of gardeners (*tottak-kara* in Tamil; *totagara* in Kannada), the art of growing plants was raised to the rank of a fulltime occupation. Similarly, the person whose occupation was to weave garlands and supply to the temple became a *malaiḡkara* (Tamil) or *malegara* (Kannada).

As the ritualistic modes of the temple increased, the use of wood for diverse purposes became a necessity. The festivals during which the deities were taken out in procession in public streets required various types of mounts and vehicles, palanquins and cars. These articles were elaborate structures of exquisite beauty ;

wood-work and wood-carving received great impetus and craftsmen associated with this occupation were the *tatccan* (Tamil) or *badagi kammara*, (Kannada).

The use of vegetable oil increased many-fold in the temples of the Medieval period in South India. Epigraphs repeatedly speak of donating *Bassia latifolia* trees/plantations to the temples so that the seeds could be pressed for burning oil. It was also a frequent custom in those days to make a gift of oil-mills. The oil-pressing device was constructed exclusively of wood and the users of the device came to be labelled as *tailiga*.

I do not imply for a moment that these and similar occupations/professions originated only in the Medieval period. All these occupations are dire necessities for the well being of any community. Long time before the concept of a temple developed—or even from the time of origin of man—his community depended upon the utilization of plants which grew around him, although there could not have been strict or rigid occupational or professional distinction in the community. The temples and public institutions only catalized the intensity and diversification of the occupations bringing to surface the hidden talent of the individuals, fostered the crafts and patronized the craftsmen, at the same time bringing about a compartmentalization of professions.

PROSPECT

If I am asked, “How far has this study helped to resolve answers to questions raised in the earlier part?”, my answer is “very little”. If a further question, “Then, has the effort been useless?” is posed, my reply is definitely a NO. As mentioned in the earlier part, the present attempt is just a beginning, that too in a rather casual way. I believe I have however, presented some data which is quite informative; they may not always lead to positive assertions, but they do supply valuable negations. Both types of data are necessary in order to understand a situation in the proper perspective.

The epigraphs have shed new light on the periodical changes that have come into our civilization, culture and society; on the impact of external and foreign factors on our way of life and living; and on the traditions and customs that have remained unchanged over centuries.

It should be emphasized that the full texts of only about 10 per cent of the available epigraphs have been published. The remaining bulk is yet stored in the custody of the Department of Epigraphy, Government of India, and hence are not available for public benefit. Vast areas of India are yet to be searched for new inscriptions. As it is, however, even a broad casual survey of the full texts and abstracts has shown the type of information that can be obtained from a botanical standpoint.

It should also be freely admitted that epigraphs alone do not give the total picture of the past situation in reference to the attitude of our ancestors to plants.

The data obtained from a study of the epigraphs should be used in conjunction with those collected from clearly dated or datable literary texts, and through the results of archaeological discoveries. It is only a harmonization of all these diverse source materials that proves to be helpful in reconstructing a reliable history of the Plant Sciences in India.

Abbreviations of Citations in the Text

Numbers followed by year refer to the serial numbers of the Abstracts of inscriptions as referred to in the Annual Reports of the Epigraphy Department. Other abbreviations are :

<i>AR-SIE</i>	— Annual Reports—South Indian Epigraphy
<i>BKI</i>	— Bombay-Karnatak Inscriptions
<i>CII</i>	— Corpus Inscriptionum Indicarum
<i>CS</i>	— Current Science
<i>EC</i>	— Epigraphica Carnatica
<i>EI</i>	— Epigraphica Indica
<i>EJEA</i>	— Empire Journal of Experimental Agriculture
<i>IJHS</i>	— Indian Journal of History of Science
<i>JAA</i>	— Journal of the Arnold Arboretum
<i>JIH</i>	— Journal of Indian History
<i>SII</i>	— South Indian Inscriptions.

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