observed in the top portion of the stem. Eightyfive varieties belonging to *S. Barberi* have been studied and in almost all of them a relatively large accumulation of starch has been noticed both at the base of the stem and at the top portion. Examination of 25 varieties belonging to *S. sinense* showed that in most of them the quantity is not so much as in *S. Barberi* but a fair quantity is present in all excepting 3 or 4 in which only traces have been met with. Twenty-six varieties belonging to *S. spontaneum* were studied and only small quantities of starch were noticed, though in 8 or 9 types a fair accumulation but lesser than in *S. sinense* and much less than in *S. Barberi* was noticed. Preliminary observations were also made on other genera and it was noticed that there was no starch accumulation in *Sclerostachya* and *Narenga*, while starch has been noticed in Guinea grass (*Panicum maxicum*), Napier grass (*Pennisetum purpureum*) and *Sorghum*. Eight types of *Erianthus* have been studied and fair to large quantities of starch accumulation were noticed.

The observations have been restricted to the fully formed portions of the stem. Sections were taken at two points (1) at the bottommost joint above the ground and (2) the joint at the top next above the dead leaf joint, *i.e.*, the oldest functioning green leaf. These observations were made on almost fully matured crop of about 11 months growth.

These studies are being continued. The indication at present is that the presence of starch in the fully formed internodes is a definite specific character for certain species of *Saccharum*. It is hoped to extend the studies to the numerous inter-specific and inter-generic hybrids at the Station to ascertain how this character is modified in these.

Sugarcane Breed. Station,
Coimbatore, N. L. DUTT.
July 26, 1949. R. NARASIMHAN.

1. Alfaro, *Ann. Conf. Cuban Sugar Tech.*, 1928. 2. Carlson, M. C., *Bot. Gaz.*, 1929, **87**, 64. 3. Haddon, E., *South African Sugar Journal* **10**, 629 4. Onslow, M W., "The Principles of Plant Biochemistry," 1931, 25. 5. Weller, D. M., *Hawaiian Planters Record*, 1929, **3**, 294.

CHROMOSOME NUMBERS IN SOME ANGIOSPERMOUS PLANTS

ACCORDING to the information of the authors, the chromosome numbers reported here are new.

*The morphological features of *Justicia adhatoda* Linn. is so different from other species that it was kept under a separate genus as *Adhatoda vasica* Nees. Its haploid chromosome number 17 as compared to 14 of other species confirms this separation.

MELIACEÆ		
Melia azadirachta Linn.	$2n=26$	Pathak & Singh
POLYGONACEÆ		
Rumex dentatus Linn.	$n=20$	,,
APOCYANACEÆ		
Allamanda grandiflora Hook.	$n=9$	Pathak & Tiwari
Tabernæmontana coronaria, Willd.	$n=11$	,,
Thevetia nerifolia Juss.	$n=9$	,,
SIMURACEÆ		
Ailanthus excelsa Roxb.	$n=31$	Pathak & Srivastava
Balanites ægyptiaca Delice	$n=9$	,,
STERCULIACEÆ		
Pterospermum acerifolium Willd	$n=19$	,,
Sterculia colorata Roxb.	$n=20$	,,
ACANTHACEÆ		
**Justicia adhatoda* Linn.	$n=17$	Pathak & Pande
Eranthemum variegata Linn	$n=21$	,,
Daedalacanthus nervosus T. Anders	$n=21$	,,
BIGNONIACEÆ		
Tabebuia pentaphylla Gomez	$n=20$	,,
Jacaranda mimosifolia D. Don.	$n=33$	,,
RUTACEÆ		
Murraya exotica Linn.	$n=9$	,,
EBENACEÆ		
Diospyros embryopteris Pers.	$n=15$	,,

G. N. PATHAK.
B. SINGH.
Govt. Agri. College, K. M. TIWARI.
Kanpur, A. N. SRIVASTAVA.
January 3, 1949. K. K. PANDE.

CULTURAL WORDS OF CHINESE ORIGIN: MONSOON

THE following information has been summarized from Yule[1] and Burnell, almost in their own words: "Monsoon is the name given to the periodical winds of the Indian seas—The original word is the Arabic Mausim, season, which the Portuguese corrupted

into Moncao and English into Monsoon. It had the sense of periodical winds among Arab pilots from whom the Portuguese adopted the word. The Turkish Admiral, Sidi Ali, writes that Mausim as a word is used for anything that comes round but once a year like the festivals. In Lebanon Mausim is the season of working with the silk, in Yemen the season of navigation." What we do realise, even today, is that monsoon represents rain more than wind and unlike wind or a rainy shower which is capricious in its nature, monsoon comes so regularly every year that the time of its visit can be predicted even beforehand. This singles out monsoon as a special phenomenon.

It is self-evident that a knowledge of the monsoon must have greatly helped navigators of the Indian Ocean. R. Sewell[2] says that the regularity of monsoon in the Indian Ocean was discovered in B.C. 47 when Alexandria was taken by Julius Cæsar. It was only after this discovery that ships began to sail direct to Malabar. But this can only refer to Indo-Roman trade and it is more probable that the Romans then acquired this knowledge directly from foreign pilots rather than by discovering the phenomenon for the first time. Here we may inquire about the maritime trade between India and the Far East and the knowledge of monsoon possessed by Eastern pilots that brought ships to India?

J. Kennedy[3] writes that "from the history of Chinese coinage it can be shown that an active sea-trade sprang up about 700 B.C. between Babylon and the East and that India had an active share in it". If the Chinese came to Babylon and sailed through the Indian Ocean they must have had precise knowledge of the monsoon and must have planned their voyages accordingly. What the Romans came to know second hand at about 50 B.C. the Chinese must have had first hand about 700 B.C.? This date strikes as rather early. According to Pelliot, as cited by Laufer, in his *Sino Iranica,* p. 543 "the earliest date we may assume for any navigation from the coasts of Indo-China into the Indian Ocean is the second century B.C.". Even this suffices for our purpose for the question can be raised, how did the Arabs, rather late in the history of navigation, happen to be the first to designate the monsoon of India such that their name alone has become almost universal? If the Chinese sailed in the Indian Ocean during the second century B.C. what was their name for the monsoon. Above all it is natural to expect that the rainy season of India should have had a Sanskrit term. But this seems secondary to those who, living in India, have expressed a far more precise knowledge of the phenomenon through their "Mrig Nakshtra" which actually gives the date, when the rainy season begins. In this light only the incoming foreign sailors, uninitiated in such knowledge and deeply impressed by the regularity with which the monsoon begins, have given it a designation connoting *the rainy season,* for nothing like it exists elsewhere.

Apart from all secondary meanings attributed to it we must admit that monsoon signifies *the rainy season.* It comes regularly, to use Sidi Ali's terminology, like an annual festival. On the contrary, Mausim, as an Arabic word, merely connotes a season and not any special rainy season. Moreover the word Mausim is derived from the root Vasm, given by Platts,[4] on p. 1090, as meaning "to describe"; "to excel in beauty". How a word to "excel in beauty" can give raise to a derivative signifying the rainy season special to the Indian Ocean can be appreciated only by philologists who have divorced all love for physical geography. I have shown before how such a far fetched etymology can be replaced by a common-sense explanation once we look upon it as a loan word. Monsoon in Chinese at once represents the phenomenon expected of the word.

Giles,[5] gives Character No. 7693, as Mao, meaning a period. It does not express a duration as in the phrase "period of a year". Instead it is used in pharases like "the fixed dates at which the muster is made" and "the morning bell in a monastery", where the beginning is precisely indicated. Character No. 275 is Chan, translated as "a soaking rain". A phrase using this word is translated as "wet to the skin" which is expected alone of a soaking rain. These two words give rise to the term Mao-Chan, a period of heavy rains, or better heavy rains, which come annually and begin at the expected time for which Mao would be the right word. B. Karlgren,[6] in item No. 602, translates the Cantonese pronunciation of

the word Mao as Mau, and in item No. 1163 Chan as T'sin. Thus Mao-Chan in Cantonese becomes Mau-Tsim which the Arabs could not have transliterated better into popular tongue than as Mau-Sim. Like typhoon, monsoon represents features of its own. As opposed to the capricious nature of rain and wind, monsoon is as regular as an annual festival. This regularity makes it conspicuous as a type. Typhoon, which is a dreadful wind, is used in terms like Tufan-Mail, meaning a very fast mail train, simply because the happier side of its nature represents its speed. Likewise Mau-Sim, the period of heavy rains, is extended to express a season which begins with as much respect to the time of the year as the monsoon of the Indian Ocean does, being then a compliment to such a season. While the secondary meanings of the term Mau-Sim have varied, the primary one, as a period of heavy rains, has been fully retained in the word monsoon even to this day.

SUMMARY

Monsoon, the English word, comes from the Portuguese, Moncao, which is derived from the Arabic, Mausim. This word has the root, Vasm, meaning nothing better than "to excell in beauty". Yet Monsoon is considered to be a derivative from this Arabic root. On the contrary, the Chinese term Mao-Chan, means a period of heavy rains. This term in Cantonese is pronounced Mau-Tsim which was transliterated into spoken Arabic as Mau-Sim. The Arab pilots learnt of Mausim from Chinese sailors. As a Chinese term alone Monsoon becomes a genuine connotative word.

Ciplas, S. MAHDIHASSAN.
Bombay,
August 15, 1949.

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THE PROTHALLUS OF *HEMIONITIS ARIFOLIA* Sm.

THIS xerophytic fern belonging to the Polypodiaceæ grows abundantly in South India, at slight elevations and generally between rock crevices and damp brick walls, etc. A brief account of the sporophyte and its anatomy has already been published (Rao, 1946). The prothallus of this fern was however not easily found. Attempts to artificially germinate the spores did not succeed as the spores found on fertile leaves were not sufficiently ripe enough. This year however, Sri. K. Subramanyam, Central College, Bangaloie, kept a careful watch for these prothalli and succeeded in securing a few which are now being described.

The prothalli were found growing gregariously amongst moss protenema on moist substrata in the crevices of rocks. A few young plants obviously derived from old prothalli were also found along with the gametophytes, often attached to them. The adult prothalli are monoecious, comparatively small in size, 3-4 mm. broad, dark green in colour and typically cordate and bilobed (Photos 1-3). Often the prothallus presents a trilobed appearance (Photo 2) probably a modification of the fundamentally bilobed condition due to enviromental factors. The growing point is only one even if the prothallus is trilobed, and is situated in the median notch as usual (Photos 1-4). Both the sex organs are equally well developed and occur together (Photo 5) on a small cushion on the underside only, so far as has been observed. The antheridia are round, numerous and appear to be as in other members of the Polypodiaceæ (Photo 4). The archegonia are short and show just three tiers of cells (Photos 5 & 6). There appears to be only one neck canal cell as in the Polypodiaceæ. So far as could be made out no mycorrhiza is associated with the prothallus. To the best