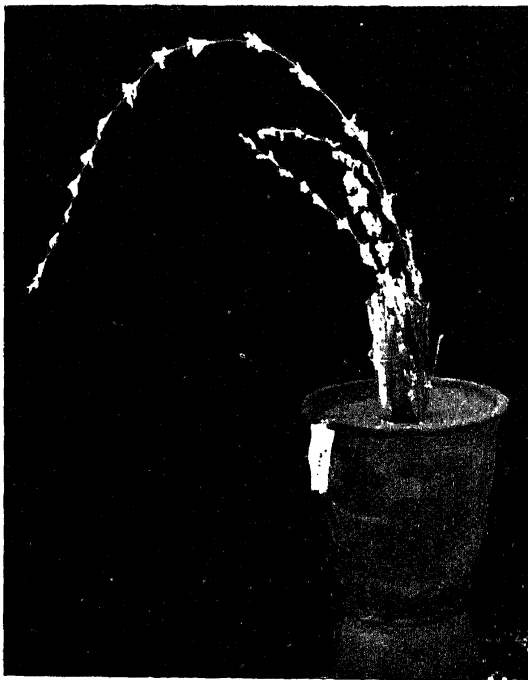


Technique of Sugarcane × Bamboo Pollination.

ONE of the difficulties experienced in hybridizing the Sugarcane with the Bamboo has been the geographical distance between the bamboos in flower—often inside heavy and not easily accessible forests—and the parents at the Coimbatore Sugarcane Station. Such distances often involve a night's journey by train to Coimbatore, besides other foot track and road journeys.

This difficulty has recently been got over by a simple technique which makes fresh bamboo pollen available at the Sugarcane Station itself for cross-pollination purposes. When a bamboo clump flowers, individual bamboos are generally cut to ground level and utilized, as such clumps generally die



after the flowering. The stumps left in the ground produce, under favourable conditions, a profusion of shoots most of which develop into inflorescence. If such stumps are collected and planted in another place after careful transportation, they put forth inflorescences at the latter place and that too for fairly continuous periods, in some cases as long as three months. The photograph shows one of these flowerings at the Coimbatore Sugarcane Station, after transport from Madras.

Dr. Agnes Arber¹ records this characteristic of the bamboo and considers "that when a bamboo approaches the flowering

phase its whole constitution is profoundly modified." The success of the present technique results from such modification.

S. A. HUSSAINY.

Imperial Sugarcane Station,
Coimbatore,
October 18, 1938.

¹ Agnes Arber, *The Gramineæ*, 1934, p. 99.

The Origin and Elimination of the Mass of Opaque Globules Bathing the Internal Organs of Aphids.

THE greater portion of the body cavity of Aphids is occupied by the delicate internal organs, bathed as it were, in a mass of oily-looking opaque globules of a yellow or brown colouration. It appears at first sight that the presence of the globules is due to the action of secretory glands of some kind. Morren¹ (1836) suspected the presence of secretory glands at the base of the cornicles. Buckton¹ (1875) first made attempts to locate such glands and failed. The writer has repeatedly searched for the suspected glands, employing various means but by no means did the search prove fruitful. The hypothesis of secreting glandular structures as the source of the globules is untenable.

Farther observations made in this connection lend support to the view that the processes involved in the origin of the globules, are purely metabolic in nature. The metabolic changes occurring in aphids result in two groups of residual end products; one consisting of excess of simple sugars and the other, of certain complex excretory bye-products. Whereas the former leave the digestive tract through the rectum and the anal opening, as the well-known "honeydew", the latter, exerting great pressure on the walls of the tract, are diffused into the surrounding hæmocele, where they remain in the form of globules in the hæmocele fluid, which is the so-called blood of aphids, as in all insects, generally. It is these globules that appear to be copious in the internal body spaces, bathing the internal organs.

The reason why these globules of an excretory nature occupy this situation and are not eliminated through the rectum, has

not been hitherto explained. The reason is to be found in the fact that the malpighian tubules which extract harmful residual products of digestion in solution in the blood, in insects, are entirely absent in aphids. The elimination of the globules from the body, however, is carried out in a simple manner by the tubular cornicles opening into the hæmocoel of Aphids in the abdominal region where the globules abound. It is a matter of common observation, that, periodically, as the density increases, tiny masses of viscous matter appear at the open tips of the cornicles and are then forced out. Mechanically, too, very small quantities of the globules can be obtained by the application of slight lateral pressure on the abdominal wall. The injurious nature of the globules can be simply demonstrated by blocking the mouths of the cornicles with glue, when, gradually, the insects become sluggish, swell up and die away, turning semicrystalline. The cornicles which are peculiar only to the group Aphidæ in the insect world, are to be regarded as the only outward passages for a periodical elimination of harmful excretory products of metabolism, in the absence of malpighian tubules.

At least one of the constituents of the opaque globules was first made out by Muller as Salicin. The writer has, in several cases, confirmed this by digesting various species of aphids in chloroform and benzene, when the globules, forced out of the cornicles, left on the watch glass, after the evaporation of the liquid, numerous radiating silky needle-like crystals which turned vivid red on being touched with a drop of concentrated H_2SO_4 . Doubtless, other constituents may also be isolated by suitable means. Salicin has been a recognised product of plant metabolic activity and is usually isolated, as harmful, from the vital processes.

B. KRISHNAMURTI.

Section of Entomology,
Department of Agriculture,
Bangalore,
November 4, 1938.

¹ A *Monograph of British Aphids*, 1875.

Ovulation in Fish.

(Effect of Administration of Extract of Anterior Lobe of Pituitary Gland.)

THE sex stimulating hormone of the anterior lobe of the pituitary gland has been the subject of considerable research in connection with the Mammalia, Reptilia and Amphibia, but so far very little work has been done on the Pisces. Cardoso (1934 b) studied the relationship of hypophysis and sexual glands in the young and immature *Pimelodus clarias* in S. Francisco River (Brazil) and the results showed that the development of the sexual glands is controlled by the pituitary. Injections of fresh extracts of hypophysis produced a big increase of the sexual organs, and in mature *Pimelodus* sp., it was possible to induce ovulation by daily injections of pituitary extract. Ihering (1935) obtained ovulation with injection of pituitary extract on *Astynax*. Young and Bellerby (1935) studied the effect of the administration of the preparation of the anterior lobe of pituitary on metamorphosis of Lamprey, but were not able to induce it by injection of anterior lobe extract.

So far as can be ascertained no investigation on the effect of the administration of the anterior lobe of the pituitary gland has been carried out on fishes in India. The Indian Carp (*Cyprinidae*), the most important of the fresh-water fishes, breed in nature in June and July when the streams are flooded by the monsoon rains. If the floods are not in time or are insufficient, the fish refuse to spawn and become egg bound (Hamid Khan, 1924). So far all attempts to make the fish, such as *Rohu* (*Labeo rohita*), *Morakha* (*Cirrhina mrigala*) and *Theila* (*Catla catla*), breed in tanks and ponds, which are not subject to floods, have not succeeded. With a view to elucidate the factors which stimulate the Indian Carp to spawn, investigations on the effect of the extract of the anterior lobe of the pituitary gland were undertaken in 1937 and 1938 and the results so far achieved, are embodied in the present paper.

I am indebted to Professor J. Gray and Dr. G. S. Carter of the University of Cambridge for suggesting the lines of research to be followed in this connection.

Cirrhina mrigala H.B., a common carp in the Punjab, attaining three feet in length