

BRANCHING PALMS.—In the *Annals of Botany*, vol. xxi, p. 415, I gave an account of the branching of palms as far as I had observed variations of this character; since then I have come across three more instances which seem to me to be worthy of record.

Two of these are remarkable instances of branching in the two cultivated species of *Metroxylon*, viz. *Metroxylon Sagus*, Rottb. and *M. Rumphii*, Mart.

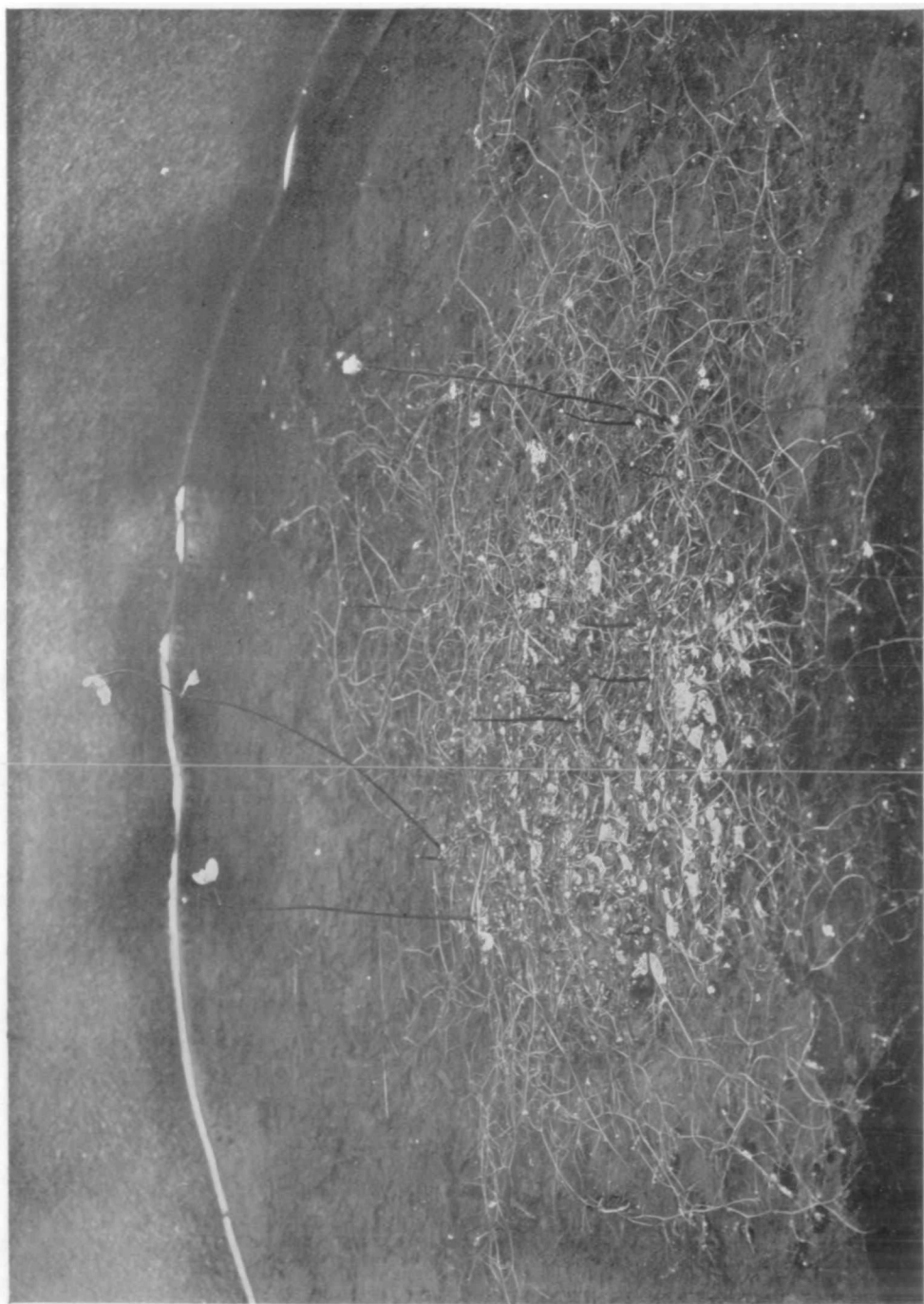
The Sago palms, as is well known, are rhizomatous palms possessing a stout branching stem which creeps half buried in the damp soil and sends up from its leaf-axils huge, lofty, erect branches which are eventually terminated by the flower panicle.

In clearing a thick patch of scrub in the Singapore Gardens, in which about twenty-five years ago a quantity of both kinds of Sago had been planted, the remarkable abnormalities, one of *M. Sagus* and the other of *M. Rumphii* growing at a few feet distant from each other, were found. In both the abnormality was almost identical, the only difference being that one had developed a little more than the other, so that one description will serve for both.

From the ordinary rhizome is growing an erect stem, now about two feet round and six feet tall; at this height the stem bears a clump of four shoots, one of which is large and grows at an angle with the top of the stem, and the three smaller shoots surround it. Below this clump is a mass of roots about a foot and a half long, so that the whole has the appearance of a rhizome with the ordinary shoots, placed on the top of a bare cylindric stem. This is *M. Sagus*. The other plant (*M. Rumphii*) is very similar except that the stem is stouter and the clump at the top is not bent at an angle, but stands exactly on the top of the bare stem. The main shoot is larger and there are four other side-shoots. The mass of aerial roots, too, is larger. The abnormality is probably due to some accident, such as the falling of a tree on the top of the two erect stems, and the big shoots probably represent the original stem shoots, which have taken on the form of a rhizomatous portion, and thrown up lateral shoots and emitted roots after the manner of a rhizome.

I have never before seen an erect stem of the Sago palms showing any signs of branching whatever, or emitting buds, and think that this is worth recording.

Korthalsia ferox, Becc. A remarkable branched stem of this rattan was brought from the Rantau Panjang Reserve in Selangor to the Agricultural Exhibition in Kuala Lumpur in 1908. The base of the stem for about six feet from where it is cut off is quite normal, but at that height is emitted a lateral shoot incomplete, and about eight inches further, a long one three feet in length. This shoot is extruded through the sheaf of a leaf, which is split three inches above the node. It is half an inch thick, and at the base, where it is extruded, are three short annular sheaths. The branch consists of eight internodes, and produces no other branches. Above the point at which this branch is produced the main stem continues, and above the next node is emitted another branch two feet long (the complete top is missing). This is similar in form and in the basal sheaths to the preceding one, but this branch emits two others. The lowest appears above the second internode; above the next internode appears another branch, which again emits another branch thirteen inches long. The branches are alternate, not quite regularly arranged, but approximately a quarter of the circle apart. The branching of rattans to a certain extent has been mentioned in the paper



UTRICULARIA EMARGINATA, BENJ.

above quoted, but in this case the branching is very much more extensive. It does not appear that these ramifications are due to any such accident as the trampling on the branch by animals, as there are no signs of rooting at any of the internodes, and indeed the branching is too extensive to render this a probable cause.

The prolific *Calamus* described and figured in the previous paper from Matang in Borneo, p. 421, Fig. 39, proves to be *Calamus pygmaeus*, Becc.

Daemonorops longipes, Mart. A plant in the Botanic Gardens has emitted a number of the long stems which lie upon the ground, the tips ascending. In one of these, which has probably been bruised or injured somehow, three shoots have been produced below the terminal one. This is somewhat similar to the production of buds on the rattan of *Plectocomia* previously mentioned, and will probably not develop much further. They are quite young as yet. The branching of the rattans of *Daemonorops* has not been observed before.

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UTRICULARIA EMARGINATA, BENJ.—Although much has been written in recent years upon the structure and development of species of *Utricularia*, there is still much to learn regarding them, and the interpretation of the homologies of the parts in these aquatic heterotrophic plants cannot be said to be yet determined beyond question; indeed, an approach to such determination will only be possible after many more species have been thoroughly studied. As a contribution to our knowledge of the genus I give the following preliminary note upon *Utricularia emarginata*, a Mexican species first described by Benjamin,¹ which is now flourishing in the Royal Botanic Garden, Edinburgh, and which, so far as I know, has not been examined carefully before now. It was introduced to Edinburgh in 1906 by means of seeds obtained from a specimen in Pringle's Mexican collections of 1904. A free-growing plant, as shown in Plate XXII, reproduced from a photograph by Mr. R. Adam, in a moderately warm temperature it flowers and seeds abundantly almost throughout the year, and these characters, along with its ready propagation from seed, make it a peculiarly favourable subject for study in the laboratory of the germination and subsequent history of this type of plant. In fact it may well become a useful plant for teaching purposes.

Mr. Laurence Stewart, foreman in the Glass Department of the Royal Botanic Garden, gives the following account of his experience in the cultivation of the plant:—

'Seeds should be sown in a shallow pan, having a thin layer of mud at the bottom, with enough water to cover the mud. Germination begins in the sixth week.

'The plant grows submerged. Experiment has shown that the best method of cultivation is to keep the plant in partial shade in still water. When plants are cultivated thus the water soon becomes alive with micro-crustacea, which when they enter the bladders are absorbed by the plant as food. Once the water is infested with the micro-crustacea, the plant grows quickly and requires room; it will cover an area of a square yard in a short time.

¹ *Linnaea*, xx (1847).