

to the author, namely two or three species of *Eragrostis* and *Drake-Brockmania somalensis* Stapf, an annual with prostrate stems. Even forms with ascending and rooting stem bases are rare in this group of tribes. In general the *Chlorideae* group of tribes is characterised by highly specialised stolons which differ considerably from the normal fertile shoots of grasses. Even some annual species with creeping stem bases (*Chloris pycnothrix* Trin., *Dactyloctenium aegyptium* Beauv.) repeat, in their basal, spreading parts of the stem, the structure typical of the "B" type (*Cynodon*) stolons, by producing several leaves from each compound node.

The length and rate of growth of stolons vary considerably in different species. In the *Chlorideae* and in the allied tribes, two types of stoloniferous grasses, characterised by the rate of growth of the stolons, have been observed. To one type belong species with rapidly growing stolons which form extensive, though rather thin, nets and in a comparatively short time produce large, open colonies. Being open, these colonies allow the growth of other plants in the areas occupied by the colonies. The actual competition between the species starts only later, when, after having covered a considerable area with a thin net of stolons, the stoloniferous grass begins to form a dense sward. As examples of this type of stoloniferous grass, *Cynodon dactylon*, *Cynodon plectostachyum*, *Diplachne jaegeri*, and *Chloris gayana* can be named. The second type is characterised by the comparatively slow growth of stolons. Species which belong to this type produce slowly spreading, but dense, nets of stolons, and form dense colonies from the very beginning of their growth. Grasses of this group occupy an area slowly, step by step, but once in occupation they retain it firmly. Amongst the grasses of this type are *Chloris amethystea*, *Eustachys paspaloides*, and *Sporobolus marginatus*.

ACKNOWLEDGEMENT.

The author is much indebted to Mr. C. E. Hubbard, Principal Research Officer, Royal Botanic Gardens, Kew, for very valuable advice on taxonomy of the grasses dealt with in the present paper.
Nairobi,
November, 1951.

A LITTLE-KNOWN WATERLILY FROM TANGANYIKA.

By P. R. O. Bally.

Botanist, Coryndon Museum.

In Unyamwesi and Ussukuma, in Western Tanganyika, grows one of the loveliest and least known of all waterlilies: *Nymphaea stuhlmanni* (Schwftth.) Gilg.

At the end of August, 1942, the writer had the good fortune to see it for the first time, from a railway carriage, travelling from Tabora towards Dar-es-Salaam. Immediately beside the railway track was a little pond, covered with large, bright yellow waterlilies. The temptation to pull the safety cord was strong; but a sense of propriety prevailed, and a unique opportunity was missed.

Ten years later, almost to the day, on August the 24th, 1952, the occasion arose to visit the area again. My enquiries revealed that the very pond that I had passed in the train was situated a few miles from

the place where I was staying. The drought had set in early, and most of the natural ponds had completely dried up. On the caked mud, however, pitted with the footprints of elephants, dried flowers and leaves were still strewn about, and some tubers were lying exposed on the surface. The drying-up of the pond must have taken place quickly, for the leaves had dried green and the petals of the shrivelled flowers were still yellow.

Waterlilies abound in most tropical African stagnant waters, predominantly bearing white, or blue to purple flowers. Some years earlier I had collected several of those species in the extensive swamps of Malagarasi; but I had seen no trace of *Nymphaea stuhlmanni*. Yellow species of *Nymphaea* are few, only two are known from Africa; and their distribution is comparatively limited.

History: *Nymphaea stuhlmanni* was discovered by Dr. F. Stuhlmann in June 1890, at a place described as "gunda mkali" near "Bibisande" in Unyamwesi, at 1200 meters (3800-4000') altitude. These names cannot now be traced on our modern maps of Tanganyika.

In Engler's "Pflanzenwelt Ostafrikas", C. 178, 1895, it is very shortly described as a variety of *Nymphaea lotus* L. (the description gives no structural details, but refers merely to the yellow colour of various parts of the flower).

Eight years later, in an annotation to his description of *Nymphaea sulphurea* (in Warburg's "Kunene-Sambesi Expedition", 236, 1903), E. Gilg published our plant as a separate species, based on distinctive characters such as the entire leaf margin, the long appendages of the anthers, etc. In 1905, H. S. Conard's magnificent monograph "The Waterlilies" gives Engler's short description verbatim; and the plant is figured with a line-drawing made from Stuhlmann's type, in Berlin.

Finally, *Nymphaea stuhlmanni* is described more fully in E. Gilg's chapter on *Nymphaeaceae africanae*, published in "Engl. Bot. Jahrb.", Vol. 41, pp 355-356, 1908. Here the diameter of the flower is given as 10-15 cm.; the prominent veins on the underside of the leaf are mentioned; and the author points out that on Conard's illustration the leaf is inaccurately shown with rounded lobes, while in Stuhlmann's type they are distinctly acute.

The plant was collected again in 1929 by a railway employee of the Tanganyika railways; living specimens were sent to Amani and cultivated at the East African Agricultural Research Institute. They did not survive for more than a few months. Dried flowers (but no leaves) were obtained for the Herbarium.

In 1935, B. D. Burtt collected specimens at Shanwa, in Ussukuma. They show well the entire margin and the acute lobes of the leaf. *Habitat:* From the few places which I inspected in Unyamwesi, it would appear that *Nymphaea stuhlmanni* is not found in permanent waters, but in seasonal pools, which dry up completely during the very prolonged dry season which prevails in the area. Thus, in a large permanent swamp there was no trace of *N. stuhlmanni*, while *Nymphaea lotus* was present. In the smaller pools, quite dry when visited, numerous remains of *Nymphaea stuhlmanni* were seen. In the dried-up portion of an artificial dam, at its lowest at the time of my visit, many half-buried tubers with dried

leaves and flowers were found in the cracked mud; while in its deepest part, where the water is permanent, there were several plants of *Nymphaea lotus*, but only one living *Nymphaea stuhlmanni* at the very edge of the water, with one flower fully unfolded. These observations point to the possibility that the tuber of *Nymphaea stuhlmanni* needs an annual period of rest in the desiccated mud, and the failure to retain it in cultivation in Amani might be thus explained.

Description: From the two Herbarium sheets in the East African Herbarium in Nairobi (Greenway 1519 from Central Tanganyika, 1929, cult. in Amani, and B. D. Burt 5215, from Shanwa, 1935) and from fresh material collected by the writer, it is now possible to describe *Nymphaea stuhlmanni* with more detail.

Rhizome: Ovoid to spherical, sometimes irregular, erect, with projecting leaf-scars 5—12 cm. long, dark, blackish-brown, densely covered with thin grey mucilaginous hairs; roots white, cylindrical, long slender.

Leaves: about twenty, on long slender, green petioles; blade ovate. 20 cm. long, 18 cm. broad, sinus open, lobes acute, green on both sides, young leaves with small purple spots on the underside; midrib and veins prominent underneath.

Flowers: 10—15 cm. diameter; *Sepals*: four, 7 cm. long, 2 cm. wide, lanceolate with a rounded apex; green outside, sulphur yellow inside. *Petals*: twenty-seven, up to 6.5 cm. long and 13 mm. wide, lanceolate, acute, sulphur yellow; *Anthers*: one hundred and thirty three, arranged in concentric rings, 9 mm to 17 mm. long, with appendages 1—10 mm. long, golden yellow on strap-shaped filaments. *Ovary*: 36 mm. diameter when mature; *Carpels*: twenty three, flat, 16 mm. high, 15 mm. wide, with a yellow beak-like horn incumbent on the dome-shaped golden yellow axile process.

Seeds: very numerous; ovoid, 1 mm. long, $\frac{3}{4}$ mm diameter, straw-coloured, with thin, longitudinal, hairlike lines.

Coryndon Museum,
Nairobi.
September, 1952.

BOOK REVIEW.

SOME GAME BIRDS OF WEST AFRICA. By William Alexander

Fairbairn. D.Sc., Edin.

With 9 colour plates by P. M. Sumner. pp 92 and xii. Edinburgh, Oliver & Boyd Ltd., 12/6 net.

This is a well-produced little volume, whose object is, as the author indicates in his preface, the recording of general information and interesting facts about the migrant and resident game birds of West Africa.

The text consists of brief accounts of 18 Ducks and Geese; 8 Francolins; 5 Bustards; 4 Guinea-fowl; and 12 smaller birds including Stonepartridge, Quail, Snipe, Quail-plover, Button-quail, and Fruit-pigeons. The matters covered for each are geographical distribution, local habitat, field appearance, voice and nesting. No measurements are given, and the pictures serve instead of descriptions, as in Roberts' work on South African birds.