CYCADACEAE.

Encephalartos humilis Verdoorn sp. nov., affinis *E. lanato* Stapf & Burtt Davy et *E. laevifolio* Stapf & Burtt Davy sed ab ambitu inter alia plantis minoribus differt.

Planta humilis. *Caudex* in toto circa 35 cm. longus, 13 cm. diam., c. 12 cm. epigeus, lanuginosus, soboliferus. *Folia* recurvata, arcte lanuginosa, glabrescentia, 30–55 cm. longa; pinnae anguste lineares, integrae, apice pungentes, mediae 9–13 cm. longae, 4–6 mm. latae, plus minus 9-nervatae. *Strobilus masculinus* usque 15 cm. longus et 4 cm. diam.; squamae mediae 1·5 cm. longae et 2 cm. latae, facies dense lanuginosae. *Strobilus femineus* ignotus.

TRANSVAAL.—Schagen Hill, *Dyer* 4806 (with male cone) type, Verdoorn 2349 and 2350, *Liebenberg* 335; Schoeman's Kloof J. C. Smuts 285; Krantz Nurseries, *Christian* 568 (with male cone); *Verdoorn* 2348; Rosehaugh, *Reynolds* 3936 (with male cone), *Mogg* 17363; Majuba in Berlin Forest Reserve, *Verdoorn* 2351.

PLATE 3.

A low plant more or less hidden in the grass, suckering freely to form small clumps, usually wedged among low rocks. *Stem* rising about 12 cm. above ground, in the wild state (often higher in cultivation, one observed to be 45 cm. tall), in all about 35 cm. long (30–50 cm. long), 13 cm. diam., usually narrowing to a cone-like apex, thinly lanate. *Leaves* recurved with leaflets forming a V, glabrescent with small patches of wool persisting, 30–35 cm. long; pinnae narrowly linear, entire, with a pungent apicule; the median 9–13 cm. long and 4–6 mm. wide, more or less 9-nerved, nerves prominent beneath. *Male cone* up to 15 cm. long and 4 cm. diam., median scales about 1·5 cm. long and 2 cm. wide; scale faces densely lanate and not very prominent. *Female cone* not seen.

The specimens quoted under *E. lanatus* Stapf and Burtt Davy in the Flora Capensis all have entire, narrowly linear leaflets and come from the Transvaal. Under this species the monographers of the genus, Hutchinson and Rattray, sank *E. laevifolius* Stapf and Burtt Davy. Recent field observations have shown that not only are these two species distinct but that a third and undescribed species is involved. Although closely related, they are nevertheless as distinct from each other, as are some of the species in other groups of the genus.

Field observations on the three species are summarized as follows:

E. lanatus Stapf and Burtt-Davy. The type comes from Toevlugt (the Native name of which is Botshabelo), Middelburg district, Transvaal, and a large number of plants were examined there. They were found on the average to have stems about 1½ to 4 ft. tall (rarely up to 5 ft. tall); to have the leaves retain the lanate covering on the rhachis for quite a long time and the cones, male and female, to be thickly and persistently lanate. The same species was seen on the Wilge River and on General Sir Pierre van Ryneveld's farm 50 miles east of Pretoria. All these places are in what is termed the highveld of the Transvaal.

E. laevifolius Stapf and Burtt-Davy. This species occurs on some of the rocky ridges of the high mountainous country around Barberton (which is in the lowveld). The plants are usually taller than *E. lanatus* with stems 5 ft. to 11 ft. tall, and the leaves longer; they are soon glabrescent and have a slight glaucous look and the cones, especially the female, become glaucous glabrous except for a small, short lanate spot in the depressed centre of the scale face.

E. humilis n.sp. This newly described species occurs on some of the grass-covered rocky hills below the mountain summits in the lowveld area. It is a small plant, often practically hidden by grass, and the stem rises only a few inches above the ground. In this respect it differs from both the preceding. Another difference is in the male cone. Three male cones each from a plant in a different locality, were seen and they were very much smaller than those of either of the other species, being only up to 15 cm. long and 2 cm. diam. as against about 24–30 cm. long and 4–7 cm. diam. The scale faces in our species are flatter than in either of the others and are a little less thickly lanate than those of *E. lanatus* and much more so than in those of *E. laevifolius*.

In connection with the size of the cones it should be noted that since the description of *E. lanatus* in the Flora Capensis is based on specimens of all three species, the measurements given for the cones should not be taken as being those of typical *E. lanatus*. They are in fact smaller than those of either *E. lanatus* or *E. laevifolius* as observed in the field. This is accounted for in one instance by the presence on a herbarium sheet of an immature female cone of true *E. lanatus*, and for the rest the measurements of the male cones were probably taken from specimens of *E. humilis*. For instance the quoted specimen *Wilms* 1355, from " Crococile River near Piet Schoeman " (Flora Transvaal, Vol. 1, p. 99, and Fl. Cap., Vol. 5, 2, p. 43) must be *E. humilis* according to the locality and in the Flora of the Transvaal the specimens mentioned in the following quoted note under *E. laevifolius* are most probably all *E. humilis:* " Davy 32d, collected on the lower slopes of Spitzkop, Lydenburg, 4,000 ft. alt., on the side near Sibthorpe's (several in a clump, all young, among grass by the roadside), and a plant collected by Sim at Rosehaugh, Lydenburg, may belong here."

The late Mr. H. Basil Christian was the first to suspect that there was a third species in this group. Among his very good collection of living cycads were some plants which he had got from the Kranz Nurseries in Schoeman's Kloof (plants said to have come from the neighbourhood) and he noted that the stems were more cone-shaped and the leaf scars smaller than any of his other species. The leaves, though resembling those of *E. lanatus* remained smaller over the long period that these plants were observed growing next to plants of *E. lanatus* and *E. laevifolius*. In connection with the leaves he also observed that they did not arise " like a bunch of asparagus " in the centre of the stem apex but appeared in close succession and the petiole was much twisted. This may be a pathological condition, but it has been noticed since on several plants of this species. Then a male cone appeared and it was like a miniature of the other two species. These observations led to the investigations which resulted in the description of this species.

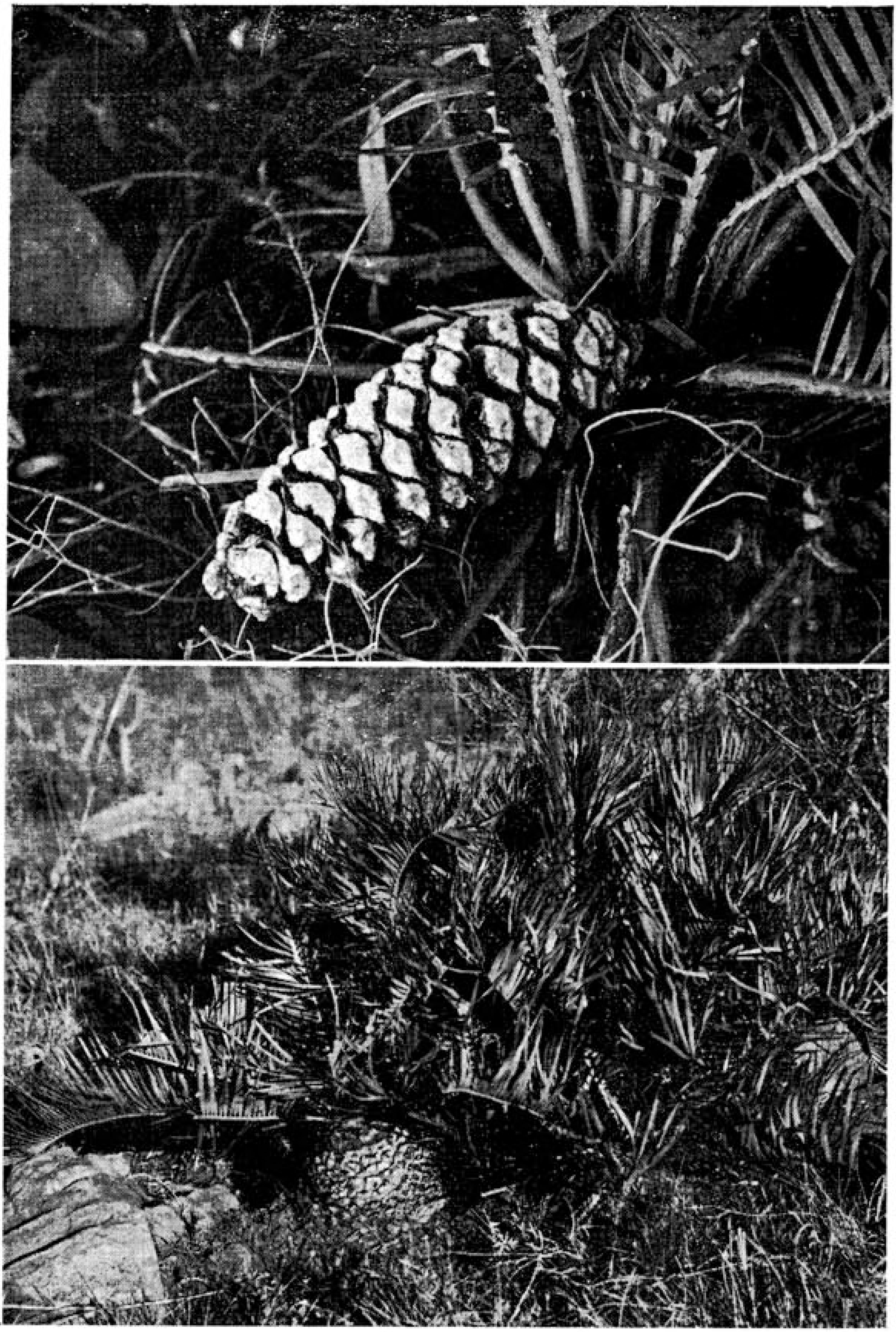

PLATE 3.

Encephalartos humilis Verdoorn. Top male cone on plant on Schagen Hill ; below, the whole plant. [*Photos by R. A. Dyer.*