XXIII. *Description of the Fruit of Cycas revoluta.* By James Edward Smith, M.D. F.R.S. P.L.S.

Read November 3, 1801.

THE *Cycas revoluta*, Thunb. *Fl. Japon.* 229, *Ait. Hort. Kew.* v. 3. 475, having, for the first time in England, produced fruit in the collection of the Honourable and Right Reverend the Bishop of Winchester, at Farnham Castle, Surrey; his Lordship was pleased to request that an account of it might be laid before the Linnean Society. For this purpose I was induced to go to Farnham in November 1799, accompanied by Mr. Sowerby, in order to make the requisite observations. We found the fruit then ripe, and exhibiting a most magnificent spectacle. The plant was much larger than any I had seen of the same species, and seems to be one of the oldest in England. We learn from the *Hortus Kewensis* that this *Cycas* has been about 40 years in our collections. It is not known that the Farnham plant was larger at its first introduction than such as are usually brought from abroad, perhaps 2 or 3 feet in the diameter of the circle formed by the expanded leaves; that diameter is now 10 or 12 feet. Supposing it therefore to have been one of the very first introduced, it has grown much more rapidly than usual; for there are few to be seen in England, even the oldest, that are half so large. I shall proceed to describe its appearance and structure.

The stem is about 2 feet in height, and 9 or 10 inches in diameter. Thunberg describes the same as rising in Japan to the height of 6 feet or more, with nearly the abovementioned diameter. Its surface is brown, and very scaly with the remains of old leaf-stalks.

stalks. A simple circle of about 40 evergreen pinnate leaves crowns the summit, forming a magnificent basin, whose margin measures 10 or 12 feet across, and 5 or 6 feet in height above the level of the bark bed of the stove. On mounting a ladder we beheld in the bottom of this verdant and shining amphitheatre a circular cluster, perhaps 18 inches wide, of above an hundred orange-coloured downy oval fruits, intermingled with innumerable palmate, pale brown, thick and woolly leaves or fronds, each of whose finger-like segments was tipped with a sharp spine. With respect to its earlier state, the Bishop has informed me, that on his arrival at Farnham early in September, the gardener informed his lordship the *Cycas* "had borne a singular appearance during summer." On inspection, the crown of the plant was found occupied by the abovementioned woolly leaves, then beautifully lacinated though not spinous, and having the appearance of a *strobilus* or cone, hollow like a bird's nest, and filled with a quantity of green *drupæ*, about the size of half-grown apricots, and intermixed with the same kind of downy greyish leaves that surrounded them. The changes which had taken place from that time to the period of my arrival were, that the whole cluster of fronds and fruit had become rather convex than concave, the fronds were browner, spines had grown at the tip of each of their lengthened segments, and the *drupæ* were become nearly as large as a moderate sized apricot, and further resembled that fruit in their rich orange hue and downy surface.

On separating some of these woolly leaves, they were found to be true fronds. Each was from 6 to 8 inches long, fleshy, entirely clothed with pale brown woolly down; their lower part a flattish stalk; their middle bearing on each margin a row of 3 or four sessile *drupæ*; their extremity dilated into a pinnatifid, or rather palmate, many-fingered leaf, whose lobes were generally curved inwards, and tipped with a spine as before mentioned. When wounded, these fronds

distilled a great quantity of thick clear insipid mucilage, which soon hardened into a substance resembling gum tragacanth, in which probably resides the nutritive quality for which this Palm is so celebrated in the *Flora Japonica*. We are there told that a very small morsel of the pith of its stem is sufficient to sustain life a long time, and on that account the plant is jealously preserved for the use of the Japanese army. The *drupæ* are also said to be used as food. We roasted some, and found in their kernels the flavour of chestnuts, with less sweetness and a more watery consistence. Each *drupa* is elliptical or somewhat obovate, a little compressed, tipped with a minute rigid point formed of the permanent stigma, which is umbilicated at its summit. The outer coat is coriaceous, bright orange red, clothed with woolly down which easily rubs off. This coat is not eatable. Nut solitary, elliptical, even, hard, whitish, tipped with a point connected with the stigma, and internally lined with a loose brown membranous integument closely enfolding the kernel, which is also elliptical, white, firm, uniform, completely occupying the shell, and consisting entirely of *albumen* *. In its upper part, immediately under the stigma, we discovered a small round cavity where the embryo should have been, but no traces of it were to be found, for want of impregnation by the male pollen, which is produced on a separate tree. Probably the flavour of the nuts might have been improved had they been impregnated.

Enough has been said to show the near affinity of this genus to *Zamia*, (see Gærtner, *tab. 3.*) from which it is chiefly, and indeed sufficiently, distinguished by its *drupæ* growing on a true frond, contrasted with the amentaceous fruit of *Zamia*. The two genera perhaps, constitute an intermediate order between *Palmæ* and *Filices*, but are surely most akin to the former.

* Gærtner rather chooses to call it *vitellus* in *Zamia*.

Cylindropuntia

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