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-

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ſtalks. A ſimple circle of about 40 evergreen pinnate leaves crowns the ſummit, forming a magnificent baſon, 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 laciniated 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 cheſnuts, 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*.

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Linn Trans VI. tab 30 p.315
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The annexed figure (TAB. XXIX.) is taken from a fine drawing by Miſs North, preſented to the Society by the Biſhop of Wincheſter. It repreſents as much of the plant as was poſſible, ſomewhat under the natural dimenſions, nor could the full number of ſurrounding leaves be conveniently admitted.

TAB. XXX. exhibits one of the fronds of its full ſize. Fig. 1. is an abortive *drupa*; 2. a ripe one; 3. a *drupa* cut longitudinally; 4. all the integuments of the fruit; 5. *albumen*; 6. cavity deſtined to contain the embryo.