(2) The method suggested by Dr. J. Neyman.[1]

The first method consists in choosing a number of elements from each stratum proportional to the total number of elements M_i in that stratum. The second consists in choosing a number from each stratum proportional to the product $M_i \sigma_i$ for that stratum. (σ_i^2 denotes the variance of the elements of the ith stratum about the mean of that stratum.) If σ_i^2 has different values in different strata, as is invariably the case, the second method is known to be more accurate than the first.

In general we do not know the values of σ_i. They can, however, always be estimated by means of a preliminary inquiry. It has been shown that if the σ_i's are estimated from sufficiently large samples (each of the order of 20 elements), then Dr. Neyman's method will almost invariably lead to more accurate results. Further it has been found that if the variability of the character sought within the single strata is very different in different strata, the gain in accuracy is of considerable magnitude.

The question of expense connected with the preliminary inquiry has also been considered and it has been found that in most cases Dr. Neyman's method is still advisable and may not prove too expensive.

The details will be found in the forthcoming issue of the Supplement to the *Journal of the Royal Statistical Society*, London.

Occurrence of Lime in Edible Momordica.

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ABUNDANT deposit of lime in the form of crystals or cystoliths have been observed in the body cells of our common "Uchhya or Corola" (*Momordica charantia* Linn.) and Kakrol (*Momordica cochinchinensis* Spreng). Lime as calcium carbonate occurs in the form of cystoliths in leaves and as calcium oxalate it occurs as crystals mostly in stems and petioles. Portions of the cuticular membrane of the under-surface of the leaves of the two species when seen under the high power of a microscope, groups of globular deposit of calcium carbonate over a cellulose skeleton are visible. Such an aggregation of globular deposit of lime is defined as cystolith. These cystoliths are frequently present in the lower epidermal cells of the leaves and due to deposits of large quantities of calcium carbonate the epidermal cells grow considerably in size. Sometimes they are as large as ten times that of the size of an ordinary epidermal cell. These inflated cells containing cystoliths are gradually pushed into a considerable depth of the mesophyllous tissue and hence in a transverse section they seem to arise from the spongy tissue of the mesophyll.

The presence of the cystoliths of *Momordica charantia* was first observed by an Italian scientist, Dr. Otto Penzig,[1] in 1881. He determined also the nature of the structures of the cystoliths. Zimmermann[2] in his recent monograph on Cucurbitaceæ has described a few European and African Momordica. It appears that no contributions have yet been made towards the anatomical nature of the leaf-cells containing cystoliths of Indian species of Momordica. I have therefore made an attempt towards this direction. A group of cystoliths is the separate deposit of lime in various fantastic aggregations on a central skeleton. Cystoliths generally occur in groups of 2–7. In Fig. 1(A), Plate I, we find a cystolith of triple group as is found in *M. charantia*. In this species cystoliths occur also in groups of 2–4. Sometimes cystoliths are present in as many groups as seven (see Fig. 2(A), Plate I). Such groups of seven are seldom met with. In the process of the growth of cystolith calcium carbonate is strongly impregnated over a cellulose skeleton and when the deposit of calcium carbonate is dissolved in dilute HCl a skeleton of cellulose with concentric stratification makes its appearance. The cystoliths of *M. charantia* are more or less of definite regular oval-shaped structures and are non-branched and monoplanous.

The cystolith of *M. cochinchinensis* appears to have not yet been reported by any previous worker (see Figs. 3, 4). They are mostly irregular in structure, branched and

[1] Penzig, *Verbreit d. cystolith etc.*, *Bot. zentralbt*, 1881, 8, 393-403 and Tables II-IV.

[2] Zimmermann, *Die. Cucurbitaceen*, Jena Verlag Gustav, Fischer, 1922.

heteroplanous. In the beginning of the formation of cystoliths in this species the cystoliths do not show much difference from those of *M. charantia* but as they grow up they branch off and ultimately show the characteristic structure as shown in the figure. Here also as in the previous species,

(*Continued on p.* 261.)

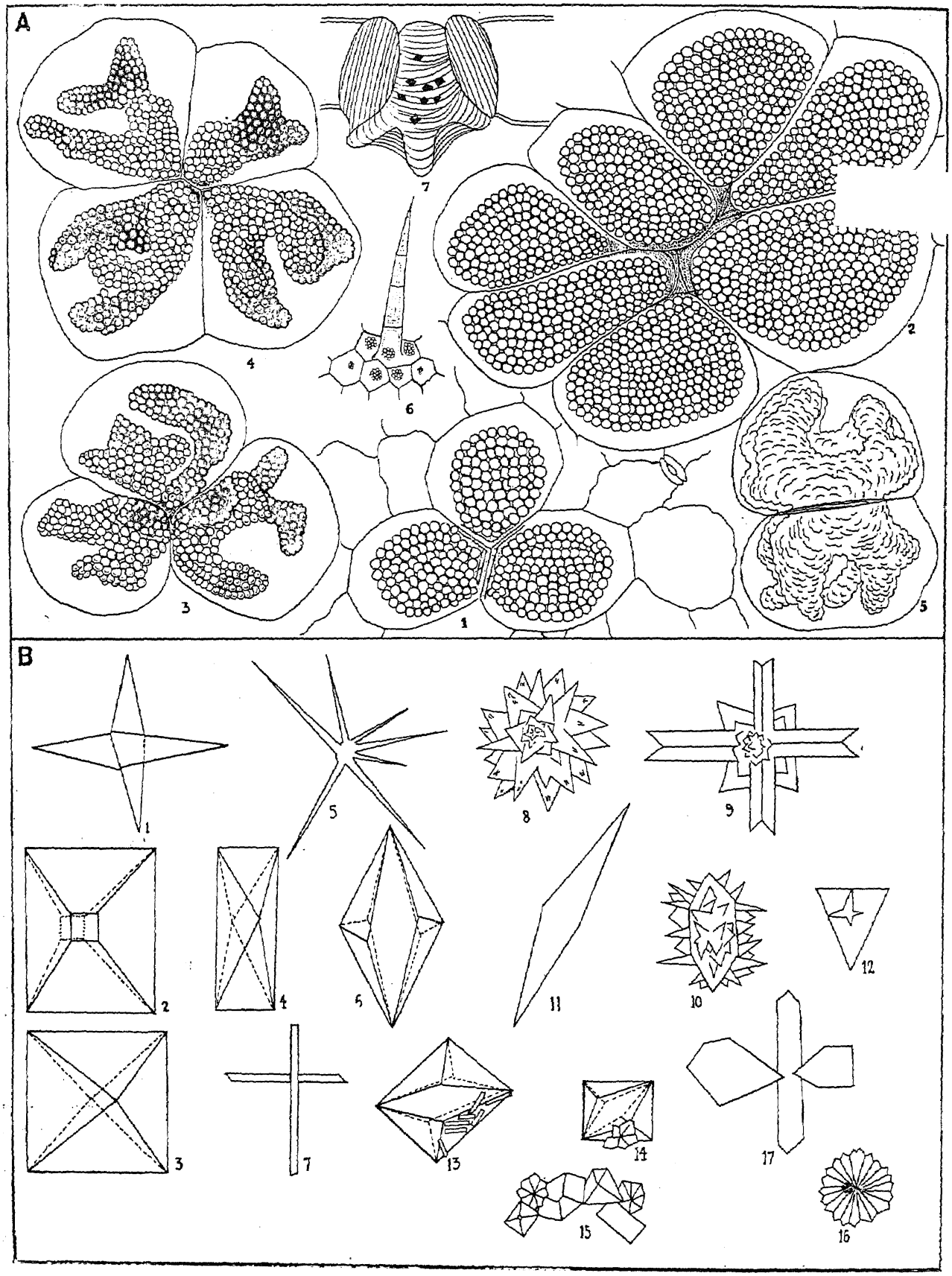

PLATE I.