Todd and Vansell[2] have shown by a series of experiments by collecting nectar from flowers with a pipette and also by analysis on the contents of the bee's honey stomach that not only do the number of pollen grains vary enormously with each species of plant, but also that they are in a large part removed while still in the honey sack of the bee by the action of the honey stopper into the ventriculus. The quantity removed depends on the length of time the bee spends on its gathering trip.

In conclusion, it may be said that whereas a pollen analysis of honey usually reveals its country of origin, only a chemical analysis can hope to reveal the sources of the nectars in its composition. I have a honey produced this summer in Hertfordshire showing a pollen count of 81 per cent *Castanea sativa* (sweet chestnut), if this should be of interest.

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[1] *Nature*, **154**, 640 (1944).
[2] *J. Econ. Entom.*, **35**, 728 (1942).

Honey from *Ailanthus*

THE attraction of hive-bees to the flowers of the Tree of Heaven, recorded by Dr. R. Melville in *Nature* recently[1], has also been noted by me in Oxford. On July 14, 1944, I was awakened at dawn by a continuous high-pitched whining hum, like that of a dynamo, in the tall trees outside this Museum, and found it to be caused by thousands of *Apis mellifica* which were visiting the male flowers. The latter are obscure and small-petalled, in large panicles, and give off a strong musky scent. Dr. Nicholas Polunin, who kindly identified the flowers as *Ailanthus altissima* (Mill.) Swingle, remarked that this kind of disagreeable smell is more commonly associated with fly-pollinated flowers such as certain Umbelliferæ. But I searched several branches at different times of day, and found practically no winged insects on the flowers except hive-bees, apart from a few small ladybird beetles.

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[1] *Nature*, **154**, 640 (1944).

Classification of Spiral Foraminifera

THE members of certain pairs of foraminiferal genera (*Nummulites* and *Operculinoides*, *Assilina* and *Operculina*, etc.) with flat spiral tests are distinguished from each other only by the rates (or angles) of opening of their spires. It therefore seems anomalous that no ruling exists as a guide in separating forms after this manner; for although the right allocation is often obvious, there are intermediate forms which might, at present, be as legitimately referred to one genus as to the other, in each of these pairs.

In order to suggest a criterion, I propose that a spire should be regarded as wide-angled if it doubles its diameter with each revolution. This criterion is easily applied when examining sections (whether equatorial or meridian), and represents a roughly intermediate degree between forms now separated by spiral

angles alone. If this criterion (or some other, for the one proposed has no inherent virtue beyond the convenience of the round figure 2) were generally adopted, it would secure more precision than now exists. I would also suggest, for this proposed critical rate of opening, the symbol 2*d*, as signifying its doubling of the diameter with each revolution. An illustration of a uniform spire with this rate of opening is reproduced herewith.
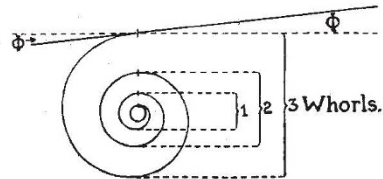
All other rates could be similarly defined: thus spires would have the symbols 1·7*d*, 2·5*d* or 3·2*d* if, and so long as, their diameters increased by 70 per cent, 150 per cent or 220 per cent respectively, with each whorl.

Again, since foraminiferal spires are seldom constant for long, this convention would also enable one to define their variations, whether individual or ontogenetic. Thus one could say, of a certain species, that the rate of opening of its spire, at a given radius, varied from 1·5*d* to 1·8*d*, and closed to about 1·4*d* at a later stated radius. It would thus be possible to give actual values to what at present can only be suggested in general terms—'very variable', 'becoming more crowded', etc.—besides enabling one to define the differences between spires better than has hitherto been possible.

I understand that, so long as a given rate of diameter increase is maintained, the outline of the whorls concerned may be represented by the equation $r = ce^{\alpha\theta}$, where r is the length of the radius vector, drawn from the centre of the spiral, c is the length of some initial radius also drawn from that centre, α is the index of the rate of opening, e is the base of Napierian logarithms, and θ is the angle made by the vector with the initial radius. The 'opening angle' (Φ in the diagram) is then $\tan^{-1}\alpha$, and either Φ or α may be taken as characteristic of the degree of openness of the spiral.

If the rate of increase is 2, then $\alpha = \log_e 2/2\pi = 0·1103$, and Φ is approximately 6·3°. Thus the critical rate of opening, for a wide-angled flat spiral whorl, could be taken as 6·3°, the practical test for that rate being the doubling of the diameter by the whorl.

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Specimens of *Asterias rubens* L. with Ten Tiedemann's Bodies

IT is well known that, in *Asterias rubens* L., nine Tiedemann's bodies are normally found. Elsewhere[1] I have previously recorded the occurrence of specimens with ten of these bodies, and have shown that the absence of the tenth (the presence of which makes the arrangement quite regular) cannot be accounted for by supposing that it is suppressed in order to 'make way for' the stone canal.