Mohl's "Primordial Utricle."

I SHOULD like to inquire, through the medium of NATURE, whether the way in which botanists now use Mohl's term "primordial utricle" is strictly accurate? In Sachs' "Lehrbuch," and in the English translation, it is applied to the *parietal layer of protoplasm* found in plant cells which are old enough to have a large central vacuole, and this practice is now generally followed by English botanists.

Now, in Henfrey's translation of Mohl's "Principles of the Anatomy and Physiology of the Vegetable Cell," it appears to be used in a different sense. On pp. 36–37 we have a description of *the young cells* of plants, in which the "primordial utricle" is spoken of as "a *very thin granular membrane*," which by appropriate methods becomes "*detached from the inside of the wall*," . . . "and consequently removes all the contents of the cell, *which are enclosed in this vesicle*, from the wall of the cell." (The italics are mine.) After this Mohl briefly refers to the nucleus, and then goes on to say that "the remainder of the cell is more or less densely filled with an opake, viscid fluid of a white colour, having granules intermingled with it, which fluid I call protoplasm."

Thus even in *young cells*, Mohl recognises not only the protoplasm and the nucleus, but a "primordial utricle" also, and save that he says it is granular, one might take it as the equivalent of what we now speak of as the ectoplasm.

Proceeding with his description, Mohl describes, on p. 38, how as plant cells become older, a large vacuole is gradually formed in the interior of the protoplasm, which then becomes differently distributed. In the result he tells us, "the protoplasm is then accumulated at one side in the vicinity of the nucleus; on the other side *it coats the inside of the primordial utricle*." (Italics again mine.)

Thus in the older cells, as well as the younger, we have a clear distinction drawn between the protoplasm and the "primordial utricle," a distinction which recent writers seem to ignore.

It is possible, though scarcely likely, I think, that Henfrey has not faithfully reproduced Mohl's conception of the "primordial utricle," or it may be that my interpretation of the above passages is at fault. In any case, it would be an advantage to have the opinions of our leading botanists on this point, as it is one which, to my own knowledge, brings some perplexity to students.

THOMAS HICK.

Owens College, June 14.

Hailstones at Cleveland, Ohio.

A REMARKABLE hailstorm occurred at Cleveland, Ohio, on the afternoon of Thursday, May 17, of a character to be remembered but probably not repeated during the present generation. Larger hailstones are rarely seen than fell on that day, and very likely few, if any, people living in this part of the country have ever witnessed a more severe bombardment.

The air was intensely sultry up to twenty-eight minutes past three o'clock in the afternoon (sun-time), when it commenced to rain. Hailstones of moderate size rattled down in profusion, and it soon appeared that an ordinary thunderstorm had begun. At the east end of the city the wind increased rapidly in force, and it grew very dark. Presently the hail became violent, and for about twenty minutes the streets and lawns presented a most animated appearance. The impact of the icy bullets against the roofs of houses sounded like the rattle of musketry. The snow-white balls glistened upon the close-cropped lawns, where they kept up a lively dance, and in the street were shattered against the flags and paving stones.

The stones, many of which were as large as billiard balls, and some of the size of goose eggs, weighed from one to five or six ounces, and probably many that fell were much heavier than this. Their shape was very various, some being spheroidal, others discoidal or exceedingly irregular. The accompanying figures represent to some extent the forms of two stones which fell on the Adelbert College lawn, and were picked up by some of our students.

A hailstone was found by Prof. F. P. Whitman to weigh nearly an ounce and a half after it had melted considerably. Its measurements were $2\frac{3}{4} \times 2\frac{1}{2} \times 1\frac{1}{4}$ inches. The surface was fissured and raised into tubercles, while many others had an exaggerated mulberry appearance, suggesting a composite structure. Sections of such stones showed, however, that they were as a rule formed about a single nucleus, and were not the result of the regelation of a number of separate pellets.

The specimen represented in Fig. 1 measured three inches in length, two in breadth, and about one in thickness. There were two opaque central masses, the larger of which contained the original nucleus, while the smaller spot probably represents a stone which became welded to the larger and older one.

A somewhat flattened, or discoidal form, which was very common, presented a beautiful agate-like core, embedded in a clear mass. A section of one of the stones, which was sawn in two, is shown in Fig. 2. There is a central ball of snow-ice,

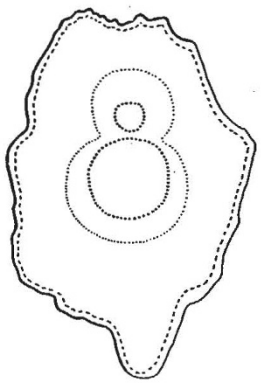

Fig. 1.—Outline of hailstone two-thirds natural size. Dimensions 3×2×1 inch.

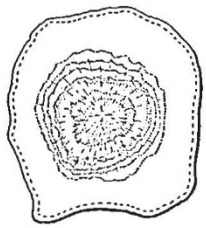

Fig 2.—Section of hailstone, two-thirds natural size.

and this is surrounded by alternating light and dark layers of varying density, and by a very much thicker clear, outer envelope, unshaded in the drawing, showing that the stone had passed through at least two distinct regions of condensation. There were also usually one or two thin superficial strata.

A stone which was examined by one of the observers at the United States Signal Office, was $3\frac{1}{2}$ inches long, 3 inches wide, 2 inches thick, and measured $10\frac{1}{2}$ inches in circumference. Another, which fell near Board of Education Building on Euclid Avenue, was weighed and measured by Principal Theo. H. Johnston. It was oval in shape and measured $3 \times 2{\cdot}5 \times 2{\cdot}75$ inches, and weighed, after some melting, $4\frac{1}{2}$ ounces. The surface of this stone was deeply pitted as by impact of warm raindrops. A second, brought in by one of Mr. Johnston's pupils, weighed 5·5 ounces. It had a large pear-shaped snow-iced centre.

The hailstorm was restricted to a belt a few miles in length, and formed a part of a general westerly storm, which was felt in this region for four or five days. During the thunder and hailstorm of May 17, the air-pressure remained nearly constant, the temperature fell from 84° to about 64° F. At the beginning of the storm the wind was south, and blowing at a rate of ten miles an hour, and increased to a rate of only 24 miles an hour. On the same day a destructive cyclone occurred at Kunkle in the north-western part of the State, in which a number of people lost their lives.

Everything in glass exposed to the brunt of the storm, when not of the strongest kind, was destroyed. Electric light globes, photograph galleries, and greenhouses suffered most. Canvas awnings were riddled. Flowers were cut down, and fruit and shade trees badly injured in many places. Horses and other animals, often too terrified to stir, winced under the stinging shot which they could not avoid. A few cases occurred of persons who were cut or stunned by the falling stones or glass. A man at the Winton Bicycle Factory was struck in the head as he stooped to pick up an unusually large stone, and was brought into the workshop in an unconscious condition. The stone went through his straw hat, and cut into his scalp.

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Finder Circles for Equatorials.

ON p. 64 of the current volume of NATURE, I find a paragraph on "Finder Circles for Equatorials," which demands