3. Pour distilled water into the beaker until the depth indicated on the scale is 20 mm.

4. Start the syphon by suction, attaching a rubber tube to the longer limb for this purpose. As soon as the syphon is working, detach the rubber tube, receive the drops in a cylinder and note the time.

5. Note the time required to deliver the desired volume.

If delivery is too rapid, the longer limb may be cut a few millimeters; if too slow, the initial depth of water in the beaker may be increased a few millimeters. After a few trials, quickly and easily made, the exact conditions can be determined. Following are some typical results obtained without any unusual precaution:

Syphon tube, outer diameter, 4.4-4.5 mm., bore, 1.2 mm. Glass beaker, 1.1 liter, outer diameter of base, 110 mm.

Total height of long limb	Total height of short limb	Difference	Initial depth of water	Volume dropped	Time	
					min.	sec.
mm.	mm.	mm.	mm.	cc.		
432	368	64	10	49	31	45
"	"	"	"	"	31	25
"	"	"	20	"	27	12
"	"	"	"	"	27	20

76 (2599)

The effects of varying internal and external pH of Valonia upon penetration of arsenic.

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A study was made of the penetration into *Valonia macrophysa* of trivalent and pentavalent inorganic arsenic by changing both the internal pH of *Valonia* and the external pH of the surrounding solution. The internal pH was decreased by subjecting the cells to $NaHCO_3$ solution, and increased by treatment with NH_4Cl solution. The external pH was varied from pH 5.0 to 9.0 by adding arsenic adjusted to the desired pH (by adding

NaOH or HCl) before the addition of sea water, and kept constant at that pH by the addition of minimal amounts of HCl. The pH determinations were made with indicators. The cell wall, protoplasm and sap were separately analyzed for arsenic. The method of handling and testing the cells was the same as that used in a previous paper.[1]

It was found:

1. That the concentration of arsenic in the sap was less than that in the protoplasm. With trivalent arsenic, the difference is less than with pentavalent arsenic.

2. The minimum amount of arsenic penetrates into the sap and protoplasm, when the external solution is approximately neutral.

3. When free CO_2 is allowed to accumulate in the plant, and the plants are then placed in pentavalent arsenic solutions of various H ion concentrations, more arsenic is found in both sap and protoplasm than in normal plants placed in similar arsenic solutions. When trivalent arsenic is used instead, the concentration of arsenic in the sap is increased, while that in the protoplasm is decreased.

4. When free NH_3 is allowed to accumulate in the plants, and the plants are then placed in pentavalent arsenic solutions of various H ion concentrations, less arsenic is found in the sap and protoplasm than in normal plants placed in similar arsenic solutions. When trivalent arsenic is used instead, more arsenic is found in the sap and protoplasm than in normal plants placed in similar solutions.

5. The pH of the external solution, as well as that of the inside of the plant, affects the rate of penetration of pentavalent and trivalent arsenic. When either or both the external or internal pH values are low, more pentavalent and less trivalent arsenic are found in the protoplasm and in the sap; the opposite is true when the external solution and the interior of the cell are alkaline.

6. There is no difference in the amount of As found in the cell wall under varying conditions; apparently the wall does not affect the rate of penetration of As into the protoplasm and the sap.

7. Differences in the rate of penetration of arsenic as influenced by changes in external pH cannot be explained by attri-

[1] Brooks, M. M., *Public Health Reports*, 1923, xxxviii, 2951.

buting them to dissociation of the acids and subsequent effect on the arsenic in the external solution. These differences in the rate of penetration seem to be due to effects on the protoplasm initiated by changes in both the internal pH of the cell and the pH of the bathing solution.

Details of this paper will be published shortly in the U. S. Public Health Reports.

77 (2600)

Suppurative otitis of the albino rat.

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It has been observed in colonies of albino rats that certain individuals become affected with a condition characterized chiefly by the following phenomena: The animal persistently holds its head tilted to one side; instead of running in a straight line it does so in a curve in the direction of the deviation of the head; and when suspended by the tail the body spins rapidly around in the same direction. It was also subsequently discovered that deafness on one or both sides accompanies these symptoms. According to private communications this condition has been observed in various breeding stations in this country, and Greenman and Duhring[1] make mention of this condition under the heading of Middle Ear Disease.

The colony under our observation consists of four strains obtained from different sources which will probably be traced to a common strain. The disease has been studied for the past twelve months, and out of 2,700 animals, twenty-three became affected at various periods. Of these, three died, two apparently from the disease, and one as a result of pneumonia. The other

[1] Greenman and Duhring, Breeding and Care of the Albino Rat, Wistar Institute of Anat. and Biol., Philadelphia, 1923, 102.