A light ball of pith or cork or a ping-pong ball covered with varnish and rolled in fine sawdust is placed in a round pasteboard mailing tube and thrown by a quick motion of the tube as indicated in the accompanying sketch. The ball rolls along one side of the tube and is spinning rapidly when it leaves the end of the tube. The result is that the ball curves sharply upwards as it flies through the air, in some cases describing the cusped curve which is mentioned by Professor J. J. Thomson.

W. S. FRANKLIN

SEED DISTRIBUTION BY SURFACE TENSION

IN response to Mr. Becker's suggestion in SCIENCE, November 17, I may record what I have been accustomed to state in public concerning the distribution of seeds of water lilies (*Nymphæa* (L.) Sm.). Indeed, I was surprised to find that the observation had not already been published.

The fruits of *Nymphæas* mature under water, and burst irregularly, discharging the seeds a few inches or feet below the water surface. But the seeds rise at once and float by reason of a buoyant aril. The aril forms a kind of double-walled sac, open at one end, and enclosing the seed. It is mucilaginous in character and carries little bubbles in and upon it. I have often watched a mass of such seeds of *N. odorata, N. cærulea* or *N. lotus* upon a water surface. They separate from one another spontaneously and distribute themselves over the tank or pond in all directions, even though both water and atmosphere be perfectly still. It is wonderful how they steer about among floating leaves, and travel to the confines of their basin. Each one seems to repel all others. I have always believed this was due to surface tension or diffusion effects, but have never undertaken to prove the point or to determine the substances causing it. After some hours, the aril splits, the pieces curl up, and the heavy seed is released and sinks to the bottom of the pond.

HENRY S. CONARD

GRINNELL COLLEGE,
GRINNELL, IOWA,
November 20, 1911

MODELS OF VORTICELLA AND CYCLOPS

TO THE EDITOR OF SCIENCE: The Department of Animal Biology of the University of Minnesota recently received a model of a small colony of *Vorticella* and a model of *Cyclops* that deserve public notice.

These models are advertised in reputable catalogs and the stands bear printed labels that announce:

Awarded Gold Medal, Franco-British Exhibition, 1908

Biological Models. Made by Smedley, London, S. E. Sole Agents, Gallenkamp & Co., 19 and 21 Sun St., Finsbury Square, London, E. C.

The models are made of a soft paraffin and are, without qualification, the poorest models that I have ever known to be advertised and for sale. They are absolutely devoid of any scientific value and are grossly untrue to even the most evident structural features. The appendages of the *Cyclops* (sp.?) are uniramous and no attempt has been made to indicate the relative lengths of the joints. Even the number of joints differs in the members of a pair. There is no attempt to represent the vestibule or "disk" of the *Vorticella* and the cilia are represented by feathers pressed into the paraffin. The paraffin is very slovenly put over wires and everything about the models indicates very crude workmanship and lack of knowledge. And such things are awarded gold medals!

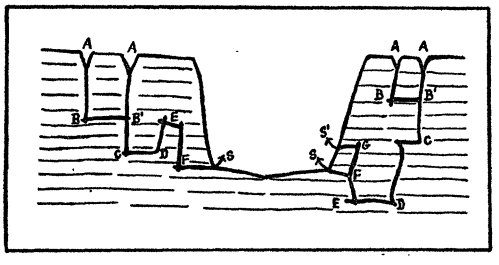
This is submitted for the protection of those disposed to use models in the class room and the laboratory.

HENRY F. NACHTRIEB

SIPHON SPRINGS AND SINK HOLES

Siphon Springs.—Intermittent springs as the result of the combination of a reservoir and siphon have long been favorite illustrations in the standard text-books of physics to show the practical application of the siphon. The familiar figure shows a small hill with a large cavern discharging its water by means of a siphon. Such a cavern emptying into a valley in this way must be extremely rare in

nature, if it ever occurs, and physiographers have done well (and physicists would do well) to omit it from their text-books. But in a modified form the siphon is probably occasionally operative. A figure which, although imperfect, is more in accord with the structure of limestone strata and the effect of solution upon them is given by de Martonne ("Traite de Geographie Physique," 1909, p. 347, fig.



147*A*). In this case (Fig. 1) the joints of the rock are shown to be widened by solution in such a manner as to make a siphon spring (*s*) possible. On the left a normal siphon is shown in which the spring does not flow until the reservoir *ABCD* is filled to *B*, that is, until the water begins to flow through the long arm *EF* of the siphon. On the right of the valley is an inverted siphon. It is perhaps unnecessary to state that although intermittent springs are the commonest of all springs the intermittent character seldom depends upon the presence of a siphon.

Sink Holes.—Sink or swallow holes are formed in one of two ways: (1) by the falling in of the roof of a cavern and (2) by the solution and erosion of the rock along joint or fault planes, the latter being by far the commoner origin. American writers of text-books of geology and physiography usually give but one explanation of the origin of these features and that the first and most unusual. Only two authors, as far as the writer is aware, give both. The popularity of the first explanation is probably due to the fact that the word "sink" implies a sinking in of the surface as well as the disappearance of the water by pouring into a funnel. The suggestion is offered that the older (?) term "swallow" hole be used, since it carries with it only the thought of the disappearance of the water in a throat or funnel.

Herdman F. Cleland
Williamstown, Mass.,
November 3, 1911

THE RÔLE OF SALTS IN THE PRESERVATION OF LIFE

In my address on "The Rôle of Salts in the Preservation of Life," published in No. 381 of Science, I made the following statement "Several authors, Lillie, McClendon and Lyon, have suggested that the fertilized egg is more permeable to salts than the unfertilized egg." Mr. R. Lillie calls my attention to the fact that he never made this suggestion. I feel it my duty not only to express my regrets for my oversight but to add that if my paper had dealt fully with the literature of the subject Mr. Lillie's ingenious experiments and original ideas should have occupied a prominent place in it, as those who are familiar with the subject will fully realize.

Jacques Loeb

SCIENTIFIC BOOKS

Observations and Investigations made at the Blue Hill Observatory, Massachusetts, U. S. A., in the Years 1906, 1907 and 1908, under the Direction of A. Lawrence Rotch. Annals of the Astronomical Observatory of Harvard College. Vol. LXVIII., Part II., 4to. Cambridge, Mass. 1911. Pp. 99–229, Figs. 15.

The work of the Blue Hill Observatory needs no introduction to the readers of Science. The progress of that unique institution, so important for American meteorology, has been faithfully recorded in the columns of this journal ever since the foundation of the observatory in 1884. Meteorologists have long since learned that the Blue Hill volumes of the *Annals of the Harvard College Observatory* are sure to contain results worthy of careful note and study.

Volume LXVIII., Part II., of these *Annals* contains the observations made twice daily in 1906–08; the usual summaries; results from the kite meteorograph and simultaneous records at the ground 1906–08; data obtained by means of *ballons-sondes* at Pittsfield, Mass., in 1908; supplementary data for a manned