washing is necessary. Nearly everywhere the pressure in water pipes varies during the day and the night. Either the dripping may become so rapid as to flood the funnel and cause a loss of the organisms or the flow may cease altogether, leaving the material in an exposed condition and hence subject to drying. To overcome this trouble the following device was used.

Prepare a funnel and filter paper in the ordinary way. Then fill a two or three gallon bottle with distilled water and stopper it. The stopper should be a one-holed rubber one through which passes a glass tube of desired length but having an inside diameter of at least one quarter of an inch. Make the stopper very secure. Empty the organisms previously fixed, into the filter and then quickly invert the two or three gallon bottle; allow the tube to extend into the funnel so that the end of it is about a half inch below the edge of the filter paper. Give a good support to the reservoir. See the accompanying diagram for arrangement.

As filtration goes on the surface of the water in the funnel falls below the end of the tube that projects into it. This allows air to pass into the tube; the ascent of the air causes water to flow out of the tube and replenish the supply in the funnel. The flow continues till the surface of the water reaches the tip of the tube when the supply is automatically shut off. The process is continued in this way as long as there is water remaining in the reservoir. The descent of the water causes sufficient disturbance of the material in the funnel to prevent the organisms from matting against the side of the filter paper.

The rate of filtration and consequently the flow of water from the reservoir may be regulated by using various grades of filter paper or several sheets of a thin quality. The writer has found that a rather heavy grade of paper permits sufficiently slow filtration so that three gallons of water will last about fourteen continuous hours.

HERBERT RUCKES

ZOOLOGICAL LABORATORY,
GROVE CITY COLLEGE

AN OPTICAL ILLUSION WITH FATAL CONSEQUENCES

THERE is an optical illusion that has probably led, within comparatively recent times, to the death by drowning of scores, or even hundreds, of capable but inexperienced swimmers. A person swimming with the wind, and consequently with the waves which travel in the same direction faster than it is possible to swim, receives the impression of being carried backward by the water. In the absence of knowledge or information covering the case, most persons, so situated, if headed toward the shore, immediately think of "undertow," a word which nearly every one has heard, and believe themselves to be caught in an offshore current. The instincts of an untrained or half-trained swimmer always lead to a nervous haste and overexertion in deep water, even under conditions most favorable for swimming. When these instincts are supplemented by the panic that arises from the belief that the person is caught in an "undertow," the resulting increase of effort and acceleration of action reduces efficiency to a degree that must certainly have left many persons fatally exhausted before they reached a footing.

My attention was first called to this phenomenon through two cases of able-bodied but indifferent swimmers who, after swimming just beyond their depths in an onshore breeze at Pasay Beach, near Manila returned to the bathhouse in an excited state and reported having been caught in an "undertow" with nearly fatal result. In each case I made immediate investigation of the water at the point indicated and found neither "undertow" nor offshore current sufficient to embarrass any swimmer. Subsequently, on numerous occasions, while initiating beginners into deep-water swimming, being headed for shore with an onshore breeze, I have heard the initiate remark, with deep concern, that there was a current against us. This required to be accounted for. The feeling of being carried backward may be satisfactorily explained to most persons as arising in the same way as the effect commonly produced on a person

seated in a stationary railway coach when a train on an adjoining track moves forward. It would be more strictly comparable with the effect produced by two trains, one on each side of the stationary coach, moving forward at the same speed.

When this optical illusion receives due publicity in courses in physics, physiology and physical culture in our colleges, schools and gymnasia, there will be less danger attendent upon open-water swimming for tank-, pond- and river-trained swimmers who venture beyond their depths in larger bodies of water. And less danger will mean less loss of life.

It will be obvious to the reader that a swimmer should choose fixed objects by which to gauge his progress. But this is not the place for a discussion of the choice and use of such objects.

Walter R. Shaw
University of the Philippines,
Manila, P. I.

SCIENTIFIC BOOKS

Flora of Bermuda. By Nathaniel Lord Britton. New York, Charles Scribner's Sons, 1918. Pp. xi + 585. Illustrated. Price $4.50.

The geographic location of the islands forming the Bermuda archipelago, distant 666 nautical miles from Sandy Hook, 700 miles from Charleston, South Carolina, 736 nautical miles to Halifax and the island of St. Thomas 800 miles away, makes their flora of unusual botanic interest. Within two days' easy sailing distance from New York, the Bermudas have been favored by American tourists, who, leaving the rigors of a northern winter behind, step off upon land with a subtropic climate. No adequate account of the interesting flora has been available to the ordinary traveler interested in the native and garden plants of the islands. A number of lists have been published from time to time, but these are inaccessible and mostly out of print. The most noteworthy of these publications, useful for the identification of the plants, are the "Challenger Report on the Botany of Bermudas" (1884), by W. B. Hemsley; "The Botany of Bermuda" (1884), by J. H. Lefroy and "Plants of the Bermudas or Somers' Islands" (1885), by O. A. Reade. The want of a compendium of the flora of the Bermudas has long been a desideratum. The reviewer felt this lack very keenly on a botanic expedition to the islands in the summer of 1905 for the purpose of ecologic investigation. The plants collected there were named by the use of the Challenger Report, which he found incomplete and unsatisfying.

Dr. Britton, after a number of visits to the islands, where he had been ably assisted by Mrs. Britton and Mr. Stewardson Brown, has at last published the results of his field, herbarium and literary studies of the Bermuda flora. He acknowledges the assistance of native Bermudians, as also American botanists, who have elaborated special groups of plants. The Flora of Bermuda is a book attractively bound in a purple binding, representing the accurately matched color of Bermudiana, *Sisyrinchium Bermudiana* L., the Bermuda blue-eyed grass, which also appears as the frontispiece. The typography of the book leaves little to be desired and the illustrations, which represent line drawings of the principal species, will enable the botanically uninitiated to determine the plants, which are native and introduced. A useful bibliography is a feature of the book and the index comprises both common and scientific names. Much interesting information, not usually incorporated in manuals of botany, is included, and rightly so. We read, for example, on page 71 under *Lilium longiflorum* Thunb., that the "Easter Lily, White Japanese Lily, is extensively grown for export in a race (*L. Harrisii* Carr,) sometimes said to have originated here, but this industry is not as important as it was some years ago, although the Lily fields are yet a very conspicuous feature in the spring. The industry commenced about 1878 and reached its greatest development from 1890 to 1903." The research of Dr. Britton and his associates has enlarged considerably our knowledge of the botanic geography of the group. The native plants of Bermuda have originated from seeds, or other parts, brought from the American mainland, or the West Indies, by the natural