itself. Long Island Sound is easily reached from the laboratory and excursions have been made on the launch of the laboratory to the rocky shores of Connecticut. A two hours' ride on the bicycle over good roads brings one to the Great South Bay, which contains certain oceanic animals not found at Coldspring, *e. g.*, *Cyanæ*, *Aurelia* and *Zygodactyla*. This great bay is almost a new field for the biologist. The few attempts at dredging there, made during the past season, indicate that it will be a fruitful field for exploration. Finally, the eastern end of Long Island, with its extensive bays, can best be studied from the Coldspring Harbor laboratory as a base.

The general outlines of our fauna and flora are already sketched. This much knowledge is necessary as a basis for further work, whether in the way of instruction or in the way of research in anatomy, embryology or physiology, or in such systematic study as shall reveal more completely the kinds of organisms living here and the conditions which determine their occurrence.

CHAS B. DAVENPORT.

COLDSPRING HARBOR, August 8, 1898.

THE NERNST LAMP.

THE *Frankfurter Zeitung* contained recently a very interesting account of Professor Nernst's new electric lamp. As information on this subject has heretofore been so difficult to obtain, a brief abstract from this article may be of interest to the readers of SCIENCE.

As has been previously announced, Professor Nernst employs magnesium oxide for the illuminating material which at ordinary temperatures is a non-conductor, but when heated to a sufficiently high degree (and herein lies Professor Nernst's discovery) becomes a perfect conductor and emits a brilliant white light. The preliminary heating of the magnesia (*A*) Professor Nernst accomplishes by placing it in the focus of a reflecter (*C*) as seen in Fig. I. On the inner side of the reflector is a spiral wire of

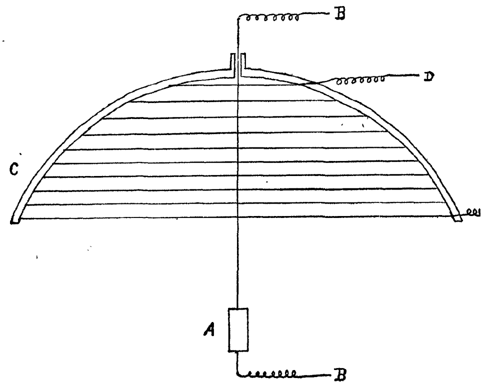

FIG. 1.

platinum (*D*) which, when brought to incandescence by a current, produces heat sufficient to render the magnesia a con-

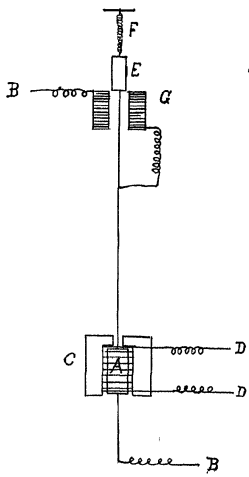

FIG. 2.

ductor; a current is then passed directly through the oxide by the wire (*B*) and that in the spiral is shut off. A complicated form of lamp is seen in Fig. II. Here the magnesia (*A*) is placed within a cylinder (*C*), which also incloses a platinum spiral (*D*). As soon as the incandescent spiral has heated the magnesia sufficiently a current is passed through the oxide by the wire (B). Within this circuit is a coil (G) which upon becoming magnetic draws down the iron bar (E), thus lowering the now incandescent magnesia from within the cylinder. Upon breaking the circuit the coil loses its magnetism, and a spring (F) raises the iron bar and magnesia to their former positions.

As advantages over the ordinary incandescent lamps Professor Nernst claims that the same amount of light can be furnished at one-third the cost, and as the magnesia allows of being heated to a much higher degree than a carbon filament a purer light is obtained. The successful employment of a cheaper substitute for the platinum is also announced, though the name is not made public. In operating, either an alternating or direct current is used.

H. Monmouth Smith.

Hampden-Sidney, Va.

BOTANY AT THE ANNIVERSARY MEETING OF THE AMERICAN ASSOCIATION.

II.

The Biology of Cheese Ripening. Professor S. M. Babcock and Dr. H. L. Russell.

The most important changes which occur during the ripening of cheese are those which affect the casein, this being gradually transformed, from the firm, elastic and insoluble conditions found in a green cheese, into the plastic and more or less soluble substance peculiar to a well-ripened product. The early explanations of these changes were purely chemical, but since the discoveries of Pasteur and others in the field of fermentation they have been attributed entirely to bacteria and other micro-organisms. Duclaux suggested that the changes in the casein were due to digesting organisms. Later observers have shown that such organisms fail to develop in competition with the lactic acid type of bacteria, which are by far the most prominent species found in normal cheese. This type appears to be unable to digest casein to any considerable extent when grown in sterilized milk, unless their activity is greatly prolonged by neutralizing the acid as it is formed, in which case again the conditions do not conform to those found in normal cheese. Moreover, the ripening changes in cheese progress at a nearly uniform rate for a long time after bacterial development has greatly declined. The authors of this paper were unable to reconcile the many apparent discrepancies of the biological theory of cheese ripening until they attempted to sterilize milk for their experiments by the addition of mild antiseptics, such as ether and chloroform, which could afterwards be removed and thus avoid changes which might be produced by boiling the milk. Such milks, although sterile, passed through changes similar to those that occur in cheese. As the agents used in this case discriminate between organized and unorganized ferments, it is evident that milk contains an unorganized ferment capable of digesting casein. This enzyme is inherent in the milk itself. The authors have given to this ferment the name *galactase*, and they believe it plays an important rôle in the proteolytic changes that occur in the ripening of cheese.

Fermentation without Live Yeast Cells. Katherine E. Golden and Carleton G. Ferris.

This paper first summarizes the rather extensive and contradictory literature, beginning with E. Büchner in 1897, who claims to have induced active fermentation of various sugars with a sterile extract obtained from dried yeast by filtration through a Berkefeld filter. Büchner's method was followed in the preparation of the yeast. In filtering, the fluid was first passed twice through three thicknesses of