Professor Osborn. Founded less than four decades ago, the department has risen in that space of time to an unchallenged position of leadership in the field, while throughout the country there are few paleontologists who have not at some time or other been connected with this institution, few museums which have not been greatly influenced by the example set by the American Museum. The present monograph is a lasting monument to Professor Osborn's work in paleontology; but a still more enduring testimony to his labors for paleontology will be the American Museum's work and the inspiration it will continue to give to workers in the field of vertebrate history.

ALFRED S. ROMER

SCIENTIFIC APPARATUS AND LABORATORY METHODS

A SIMPLE METHOD FOR THE GERMINATION OF OOSPORES OF SCLEROSPORA GRAMINICOLA

THE germination of oospores of *Selerospora graminicola* has been a subject of interest since the time of Schroeter.[1] However, no one except Magnus[1] has succeeded in germinating oospores, prior to the writer's recent investigation.[2,3] In further studies in the department of plant pathology, University of Nebraska, a simple method for the successful germination of oospores has been devised. Briefly, the method consists of placing a layer of moistened cotton in the two parts of a Petri dish. Then a small piece of moist filter-paper on which small amounts of oospore powder are placed is put upon the surface of the moist cotton in such a way that the filter-paper will partly, but not entirely, touch the cotton. Both the cotton and filter-paper must be drained of excess moisture before the oospores are added to the dish. It is essential that the space between the two layers of cotton in the dish be about one half the height of the dish. Small blocks of 2 per cent. agar-agar, on which the oospores are scattered over the surface just as the agar is hardening, can be substituted for the filter-paper. One difficulty encountered when moist filter-paper is used is that the oospores on the periphery of the mass germinate earlier and better than those in the mass.

The time required for germination is markedly different at different temperatures. For instance, the time required for germinating at 35° C. is 22 to 40 hours; at 30° C., 24 to 45 hours; at 25° C., 30 to 48 hours; at 20° C., 42 to 60 hours; at 15° C., three to four and one half days, and at 10° C., nine to ten days. The percentage of germination, of course, varies with the temperature and also to a great extent with the source and age of the oospores. Therefore, it is advisable that oospores from different sources and ages be tested. Germination has been obtained within a range of 10° to 35° C. The optimum temperature appears to be near 20° C., although in previous experiments a higher optimum temperature over a short period of time was reported.[3]

[1] J. Schroeter, *Hedwigia*, 18: 83–87, 1879.
[2] M. Hiura, *Agriculture and Horticulture* (Japan), 4: 11–20, 1929.
[3] M. Hiura, *Jour. Plant Protect.* (Japan), 16, 5 pp., 1929.

MAKOTO HIURA
IMPERIAL COLLEGE OF AGRICULTURE,
GIFU, JAPAN

A PRACTICAL FLAGELLA AND CAPSULE STAIN FOR BACTERIA

THE following method of flagella and capsule staining is offered as a contribution both to the teacher of bacteriology and to the technician in the laboratory. It is rapid, simple and dependable. It has been especially designed for staining *Bacillus proteus vulgaris* and *Bacillus subtilis*, common soil species, and the various members of the colon-typhoid group. The procedure is as follows.

(1) Make a thin smear of 15 to 24 hour agar growth of bacteria in a loopful of water on a clean slide. Air-dry. Do not heat. (2) Cover with mordant (5 per cent. tannic acid, 3 parts; 10 per cent. ferric chloride, 1 part) for two minutes. (3) Put seven drops of mordant in a small receptacle and add 1 drop of Ziehl-Neelsen carbol fuchsin stain. Mix. Add 1 drop of concentrated hydrochloric acid. Mix. Add 1 drop of concentrated formaldehyde. Mix. (4) Pour off mordant from slide and cover smear with the mixture prepared in (3). Apply seven minutes. (5) Wash smear in running water. (6) Cover with Ziehl-Neelsen carbol fuchsin stain (Basic fuchsin, 10 grams; ethyl alcohol, 95 per cent., 100 cc; phenol, 5 per cent. aqueous, 1000 cc) and *gently* steam for one half minute. (7) Remove stain with running water. (8) Blot and examine.

The following precautions are in order.

(*a*) Take only a minute portion of the agar growth. Do not use semidry agar. For best results add the agar growth to a drop of water on a slide, stir, and let stand for five minutes, permitting individual bacteria to become detached from the agar mass; then spread loopful on another slide and work with this second slide. (*b*) The mordant will keep indefinitely and so can be prepared in quantity. The mixture