An additional safety factor, in the form of a one inch glass tube, is installed to accommodate any back-flow of water between the mercury trap and filter pump.

JULIUS E. NORDBY
AGRICULTURAL EXPERIMENT STATION,
UNIVERSITY OF IDAHO

THE PREPARATION OF PERMANENT SLIDES OF THE RHIZOPOD ARCELLA

HEGNER[1] has recently described a convenient method for fixing and preserving specimens of the shelled rhizopod Arcella. By his method, Schaudinn's alcoholic-acetic-sublimate is poured over the animals while they are attached to the bottoms of Petri dishes, and clearing and preserving are effected by the use of glycerin.

We use a similar method in the preparation of slides of Arcella in our protozoology course, and it is believed that a note upon the method will be of interest, for it supplements Hegner's method in that it concerns the staining of the arcellas as well as their fixation. The procedure follows.

The arcellas, together with several drops of fluid, are transferred from a hay-infusion stock culture to clean micro slides. The slides are set aside in a moist chamber and are left undisturbed for at least half an hour. In this interval, many of the arcellas usually settle to the bottom of the fluid and attach to the slides by means of their pseudopodia.

The surplus fluid on a slide is now poured off. This operation leaves the animals still attached to the slide and covered only by a relatively thin film of fluid. Schaudinn's solution (used cold) is now dropped directly on the arcellas by means of a pipette and is left on the slide for two or three minutes. This method of fixation leaves the animals attached to the slide, frequently with pseudopodia extended. Thus the common difficulty of cementing protozoa to the slide is circumvented by the behavior of the arcellas themselves.

The slide is now ready for staining, and in this process it is treated entirely like a histological preparation. It is immersed in succession in the following fluids: 70 per cent. alcohol, made light brown by the addition of tincture of iodin (to remove sublimate), 30 minutes; 50, 25 per cent. alcohol, water, 1 to 3 minutes in each; dilute Delafield's hematoxylin (1 part stock Delafield to 3 parts water), 5 to 10 minutes; water, 25, 50, 70, 95 per cent. alcohol, absolute alcohol, equal parts absolute alcohol and xylol, pure xylol, 1 to 3 minutes in each; balsam.

If desired, Heidenhain's iron hematoxylin may be used instead of Delafield's. In this case, after fixation and treatment with iodin, the slides are hydrated, and are then mordanted an hour in 4 per cent. ammonio-ferric sulphate (iron alum). They are stained at least four hours in 0.5 per cent. aqueous hematoxylin solution and are destained in 2 per cent. iron alum, after which they are dehydrated, cleared and mounted.

In preparations stained by either method, the nuclei, of which there are two in most species, each with a conspicuous central karyosome, are revealed with diagrammatic clearness. The shell aperture and the extended pseudopodia are likewise well shown. Arcella is particularly favorable for the demonstration of chromidia, and by this method the chromidial bodies—commonly overlooked by students—are rendered clearly visible.

In conclusion, the method affords a convenient procedure for demonstrating certain cell organelles which are not readily observed in the living animal. Furthermore, the permanency of such preparations makes them available for class study or demonstration at times when living arcellas are not immediately obtainable.

C. DALE BEERS
ZOOLOGICAL LABORATORY,
UNIVERSITY OF NORTH CAROLINA

SPECIAL ARTICLES

ACTINO-URANIUM AND THE RATIO OF ACTINIUM TO URANIUM IN MINERALS

VARIOUS speculations have been advanced in the past about the origin of actinium.[1] However, the experimental evidence in all cases is fundamental. This evidence is (*a*) Boltwood's original work[2] on the "constancy" of actinium to uranium in several uranium-bearing minerals from North Carolina, all presumably of the same age; (*b*) the very important recent work of Aston on the relative intensities of the mass spectral lines Pb_{208}, Pb_{207}, Pb_{206} from the lead isotopes of a bröggerite from Karlhus, Raade, Norway,[3] and also Aston's similar work on the ordinary lead,[4] and (*c*) the observations of various investigators that the relation of actinium to uranium seems to vary somewhat in minerals which may be of different ages. Among these the most recent work is that of Wildish.[5]

Rutherford[6] using Aston's data and making certain

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[1] Résumé in *Radioactivity Bull. N.R.C.*, No. 51, 1929.
[2] B. B. Boltwood, *Am. J. Sci.* [4] 25: 269–298, 1908.
[3] F. W. Aston, *Nature*, 123: 313, 1929.
[4] F. W. Aston, *Nature*, 120: 224, 1927.
[5] James E. Wildish, *J. Am. Chem. Soc.*, 52: 163–177, 1930.
[6] Sir Ernest Rutherford, *Nature*, 123: 313, 1929.