transcripts of the papers sent in, but simply passes them on to the press writers for their inspection. These gentlemen do all the writing, and the selection of the material to be written up, as well as the method of presenting it, is left entirely in their hands. The Press Service regards them as competent experts in their line, just as the authors of the papers are in theirs.

The quality of the material received this year was excellent, so good, in fact, that this more than made up for the somewhat limited quantity. For some time there has been noticed each year an improvement over the year preceding in the form in which the manuscripts are prepared, and this year the improvement was especially noteworthy.

The Press Service is deeply appreciative of the cordial cooperation received from the secretaries of the sections and societies and the members of the association on the one hand, and the representatives of the press on the other. Any comments or suggestions made are not to be taken as implying any criticism or lack of appreciation. They are made with the object of bringing us ever nearer that elusive goal, perfection.

AUSTIN H. CLARK,
Director

SCIENTIFIC APPARATUS AND LABORATORY METHODS

PREPARING AND STENCILING TOPO-GEOLOGIC MODELS

FOR laboratory study in college courses in geology it is desirable to have at least one model for four students. In large classes this means a large expenditure for equipment and consequently the least possible cost for models. Economy may be effected by quantity production at the place of demand, especially if the institution has a museum staff especially trained to do the work. Geologic models equal in area to the size of quadrangle maps published by the United States Geological Survey are commonly useful and may be prepared in the following manner at minimum cost.

Beginning with the lowest, each contour on the map selected is traced onto a separate cardboard which is of suitable thickness to give the desired result of relief exaggeration. The pantograph may be used to vary the size of the model. The areas enclosed by contours are cut out with scissors, a jig saw or an appliqué machine. The pieces representing successively higher levels are nailed one on top of the other until the relief is shown in a series of irregular steps. Accurate vertical registration may be obtained by having each original cardboard squared up with the edges of the map; this may be used as a guide if the cut contour area is held in place on the card until it has been nailed onto the growing model. The waste may then be pulled away. Registration may also be insured by setting up dowels on the base to which the contour cards are nailed. On the map circles corresponding to the positions of the dowels allow one to trace their position and cut them out on each contour card, which is slipped onto the dowels and nailed in position.

When the construction of the topography is completed, plasteline is applied to smooth off the step-like structures caused by the cardboard. A frame to form a well is fitted around the model. Petrolatum is applied to the surface of the model and inside the frame. A mixture of plaster of Paris and water is poured into the frame and a soft brush is plunged into it and drawn back and forth on the surface of the model before the plaster sets; this releases air bubbles and eliminates patching of the negative or model. Jarring the model is also effective.

After the mold has become thoroughly dry, which sometimes takes several days, it must be given two or three coats of thin shellac. The mold may then be utilized to make as many casts as are desired in plaster, wax or papier-maché. Plaster casts are the most economical and may be reinforced with quarter-inch wire mesh, which is sunk into the plaster before it sets. The mold must be greased each time a cast is made. When dry the casts are shellacked.

In preparation for the stencil, which facilitates the painting of the geological pattern, an extra mold and cast are made, being careful to have the sides of the mold vertical to the edges of the map. Vertical registration of the sides will be automatically accomplished if a wooden frame is fitted to the original model and used for all casting.

The geological pattern is drawn on tracing paper, which is laid over the map. The tracing paper is then fastened to the bottom of the mold and with a sharp knife blade the pattern is cut through and scratched onto the smooth surface of the bottom of the mold. The pattern is then gone over with a lead pencil to make it distinct. During this and the following process the mold rests on the cast. All the casting must be done on a smooth level surface such as slate, in order to insure accurate vertical registration of the geological pattern when it is cut through the mold.

The mold and cast are then placed on the cutting table of a jig saw and the pattern is cut into pieces corresponding to a puzzle. The pieces of the cast are thrown away and a new cast is made to act as a support for the mold pieces when they are not being used. The pieces should be thoroughly shellacked. Any parts of the geological pattern may be painted on a fresh cast with the air-brush. This is done by protecting the surrounding parts of the cast with the pieces of the stencil. After a single color has been applied to several casts, and has become dry, other colors may be blown on in succession until the whole geological pattern has been applied to the casts. Lakes and major streams may be blown on with the air-brush through a sheet lead stencil which has been drawn down to fit the topography. Complicated stream patterns and printing require hand work.

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A METHOD FOR CONCENTRATING AND FIXING FREE-LIVING PROTOZOA ON COVER GLASSES

IN making slides of free-living protozoa the greatest difficulty usually encountered is the sticking of large numbers of organisms on the slide or cover glass, as the case may be. This difficulty is greatly overcome by the following method for fixing on the cover glass. By folding paper with a porousness comparable to that of mimeographing paper, make a box about 20 mm deep and of a size into which the cover glass closely fits. Smear the cover glass thinly with egg albumen and place it face up into the box. Stand the box on blotting paper and fill it with fixative to a depth of 4 mm, or more if the cultures are poorly populated. Into the fixative pipette an equal, or less, amount of water containing the protozoa. The fluid seeps out and is absorbed by the blotting paper. Because the seepage is uniform and relatively slow, the organisms are left securely fastened and evenly distributed on the cover glass. When only a thin film of the fluid still envelops the organisms, remove the cover glass and drop it face down into a dish of the fixative. After fixation, follow the usual procedure for the fixing solution and stain selected. Reverse the above process, when fixing rhizopods, by putting them into the box, allowing them to become attached and then adding the fixative.

The various fixing solutions and stains give good results with the above method. Navaschin's solution is particularly good for sticking the organisms on the cover glass. Since the crystal violet-iodine staining method leaves the cytoplasm almost colorless, yet stains the nucleus well, it is excellent for studying nuclear divisions in total mounts of protozoa. With this stain and the above method for fixing, the nuclear behavior in ex-conjugants of *Paramecium caudatum* is easily followed; the chromosomes are especially sharply defined.

J. T. BALDWIN, JR.

THE BLANDY EXPERIMENTAL FARM AND
THE MILLER SCHOOL OF BIOLOGY
UNIVERSITY OF VIRGINIA

SPECIAL ARTICLES

THE INCIDENCE OF THE DISEASE-PRODUCING AMOEBA (ENDAMOEBA HISTOLYTICA) IN 1060 COLLEGE FRESHMEN AND ITS SIGNIFICANCE

DURING November, 1933, the newspapers of the country carried items concerning an "outbreak" of amoebic disease in Chicago, with reports of 100 or more cases and a number of deaths. These reports gave the impression that the disease-producing amoeba (*Endamoeba histolytica*) is extremely rare and mostly confined to the tropics.

While it is true that amoebic disease is more prevalent in the tropics and that the incidence of the parasite tends to become lower in the more temperate regions, nevertheless, it has been amply demonstrated that this amoeba is world-wide in its distribution and is not uncommon in the more temperate climates. In fact, the first case of amoebic dysentery to be reported in the literature, by Lösch in 1875, was found in a northern locality, St. Petersburg (now Leningrad), Russia. Since then the disease and the parasite have been extensively studied in many parts of the world.

Craig[1] has called attention to the probability that between 5 per cent. and 10 per cent. of the population of the United States harbor *Endamoeba histolytica*, while, in our more southern states, Faust,[2] Meleney[3, 4] and others have found a still higher incidence of infection. In order to determine the incidence of *E. histolytica* and other intestinal Protozoa in college students, the present authors added an examination of a single ordinary stool to the regular medical ex-

[1] C. F. Craig, "The Amoebiasis Problem," *Jour. Am. Med. Assoc.*, xcviii: 1615–1620, 1932; "The Pathology of Amoebiasis in Carriers," *Am. Jour. Trop. Med.*, xii: 285–299, 1932.

[2] E. C. Faust, "A Study of the Intestinal Protozoa of a Representative Sampling of the Population of Wise County, S. W. Virginia," *Am. Jour. Hyg.*, xi: 371–384, 1930; "The Incidence and Significance of Infestation with *Endamoeba histolytica* in New Orleans and the American Tropics," *Am. Jour. Trop. Med.*, xi: 231–237, 1931.

[3] H. E. Meleney, "Community Surveys for *Endamoeba histolytica* and Other Intestinal Protozoa in Tennessee," *Jour. Parasitol.*, xvi: 146–153, 1930; H. E. Meleney, E. L. Bishop and W. S. Leathers, "Investigations of *Endamoeba histolytica* and Other Intestinal Protozoa in Tennessee." "III. A State-wide Survey of the Intestinal Protozoa of Man," *Am. Jour. Hyg.*, xvi: 523–539, 1932.