CHEMISTRY SECTION

Chairman, L. A. Bigelow, Duke University.
Vice-chairman, F. W. Sherwood, State College.
Secretary-treasurer, H. D. Crockford, University of North Carolina.
Councilor, L. G. Willis, State College.
Executive Committee, A. S. Wheeler, R. W. Bost and W. C. Vosburg.

MATHEMATICS SECTION

Chairman, E. T. Browne, University of North Carolina.
Secretary, E. R. C. Miles, Duke University.

PHYSICS SECTION

Chairman, J. L. Lake, Wake Forest College.
Secretary, Calvin Warfield, North Carolina College for Women.

The thirty-first annual meeting of the North Carolina Academy of Science will be held at Wake Forest College, Wake Forest, N. C., in the spring of 1932.

H. R. TOTTEN,
Secretary

THE VIRGINIA ACADEMY OF SCIENCE

THE Virginia Academy of Science held its ninth annual meeting in Norfolk, on April 24 and 25 with a registration of 242.

The evening address to which the public is particularly invited was delivered by Dr. William A. Kepner, of the University of Virginia, on the subject "A Modern Drift in Biological Thought." There were 111 papers read before the various sections.

A new section was authorized at this meeting—a section on medical sciences. It is expected that the new section will function along the lines of Section N of the American Association for the Advancement of Science. Physicians in Virginia who are interested in the fundamental medical sciences, such as anatomy, bacteriology, biochemistry, embryology, pathology, pharmacology and physiology, will be welcomed to membership in the academy and to participation in the activities of this and other sections.

It is confidently expected that this new section will grow rapidly, as it offers scientifically inclined physicians an opportunity to read scientific papers before an appreciative audience, to take part in stimulating discussions and to become acquainted with other like-minded scientific men.

Dr. I. D. Wilson, of the Virginia Polytechnic Institute, was elected president for the coming year, and Dr. H. E. Jordan, of the University of Virginia, new member of the council.

E. C. L. MILLER,
Secretary-Treasurer

SCIENTIFIC APPARATUS AND LABORATORY METHODS

RUTHENIUM TETROXIDE AS A FIXATIVE IN CYTOLOGY

IN the preparation of certain tissues for microscopic examination, use is frequently made of osmium tetroxide as a fixing or killing agent. This use is largely to avoid coagulants which would materially change the natural structure of the protein constituents of the cell. This note is to call attention to the possibility of the use of ruthenium tetroxide for this purpose, inasmuch as this compound is one of the two examples of the highest state of oxidation known, the other being the corresponding osmium compound.

Ruthenium tetroxide decomposes very readily and is a very energetic oxidizing agent. It is difficult to prevent its decomposition in solution even when kept in the cold and in the dark. We have been most successful in this respect when saturated chlorine water has been used as solvent. Ruthenium tetroxide is supplied in sealed glass ampoules which may be crushed under the cold solvent with no difficulty or danger. It forms a golden yellow solution from which after several weeks a black deposit of the lower oxides of ruthenium separates, at which time its fixing properties have largely disappeared. A stock solution was prepared by breaking a one gram ampoule of the tetroxide under 100 cc of chlorine water. The tetroxide is not very soluble and the greater part remains undissolved so that a saturated solution with respect to the tetroxide is still maintained even after the majority has passed into the lower oxides. For use as a fixative, the stock solution was diluted about twenty times with either distilled water or a $\frac{1}{4}$ to 1 per cent. formic or acetic acid solution.

The ruthenium tetroxide fixative was used extensively on pollen mother cells of *Tradescantia zebrina* (Hort) and closely compared with osmium tetroxide. The ruthenium salt was found to be extremely useful in obtaining the chromonematic structure of the chromosomes at all stages. The morphological results of these studies will be published elsewhere.[1] From our experiences it appears that ruthenium tetroxide is preferable to osmium tetroxide when used for the purpose described. The advantages are, however, partly offset by the fact that ruthenium tetroxide will

[1] B. R. Nebel, "On the Structure of the Chromosomes in *Tradescantia zebrina* (Hort.)," *Zeitschr. f. Zellforschg.* In press.

not penetrate deeply into several layers of tissue, as is possible with the osmium salt. It fixes the outer cell layers very well but it appears to have been mostly decomposed before cells in the interior of a structure can become fixed. Methods to overcome this difficulty are being studied.

To familiarize the reader with the use of the fixative, the following general procedure is given—(1) Smear anthers between two slides, (2) immediately drop diluted fixative onto slides and leave for 3 minutes, (3) pour off fixative and replace with one drop of Linder's medium (glycerine 40, lactic acid 20, phenol 20 and water 20 per cent.), (4) cover and seal. The fixative should render the material distinctly gray (but not black) during the fixation process when viewed against a white background. Under the microscope the chromonemata appear dark against the gray protoplasm. If staining is desired, a small amount of carmine may be added to Linder's medium or the slides may be dehydrated after fixation and stained by other methods. Treatment with H_2O_2 was found to be distinctly detrimental to maintaining the fixed cell structures.

D. C. CARPENTER
B. R. NEBEL
NEW YORK STATE EXPERIMENT STATION,
GENEVA, N. Y.

A METHOD FOR LOCATING THE LARVAE OF THE MOSQUITO MANSONIA

ENTOMOLOGISTS and sanitary engineers engaged in mosquito work often experience difficulty in locating the breeding places of *Mansonia perturbans* Walk. even though the abundance of this mosquito at the particular time and place is such as to make it a very serious pest. The writer has been engaged in investigations of the biology of *Mansonia* in central Florida for the past two years and has developed the method here described for collecting larvae of this insect. Of several methods tried, this has proven the most satisfactory in locating breeding grounds of *Mansonia*.

The larvae of *Mansonia* differ from those of other mosquitoes in that, with the exception of the first few days of larval life, the larval and pupal periods are spent at the bottom of the ponds and marshes where they breed. Peculiar adaptations of the larval air tube and of the pupal breathing trumpets enable them to pierce submerged roots and stems of plants and obtain air therefrom. Difficulty in locating the breeding grounds has undoubtedly arisen on account of the fact that the larvae quickly detach from stems and roots when disturbed and bury themselves in the débris at the bottom of the pond. Thus very rarely are they found by merely examining submerged stems and roots which have been pulled out of the water.

Actually to determine whether or not a marsh is breeding *Mansonia,* the plants over a small area (in practice about one square yard) should first be pulled up, thus disengaging any larvae that may be attached thereto; immediately after which the débris from the bottom of this area, in which if present the larvae are hidden, should be scooped out to a depth of about one inch. This may be done by means of a vessel having a screened bottom. A regular water bucket, the bottom replaced by twenty mesh screen wire, has proven satisfactory for this operation. As each scoop of débris is collected it is placed in a twenty mesh screen wire basket which is held partly submerged and holds in captivity any larvae thus collected. By keeping this basket partly submerged and by occasional shaking a large quantity of mud and minute trash is washed out, thereby lessening the quantity of débris to be examined later. This wire basket may be of any shape, but one recommended on account of ease of construction is conical, having a diameter at the mouth of eighteen inches and a depth of twenty-four inches.

The basket with its contents is next carried ashore for examination. The procedure usually followed in examining the débris is to place a small handful of it in a white enameled laboratory pan, adding about one quart of clear water, and then carefully to search the pan for larvae. If present, the larvae, which are whitish and very active, will be found at the bottom of the pan. Often, however, some individuals, usually those which have been injured by rough handling, are found at the surface of the water.

The number of these examinations necessary to determine whether or not a given area is infested with *Mansonia* will, of course, depend on the size of the marsh and on the number of different types of environment present therein.

T. E. MCNEEL
BUREAU OF ENTOMOLOGY,
ZELLWOOD, FLORIDA

SPECIAL ARTICLES

ON ATMOSPHERIC ELECTRICITY

ACCOUNTS of certain remarkable effects of atmospheric electricity on the growth of plants have been related by enthusiasts both in this country and abroad. Yield increases of more than thirty per cent. have been reported from fairly definite and systematic yield tests. The results of other investigations have been negative, no significant yield increases having