On Friday evening, Professor H. L. Minton, of the Arkansas State Teachers College of Conway, delivered an illustrated public address on "The Tornado in the United States." On Saturday morning, a field trip was led by the state geologist, Dr. George C. Branner, to the Magnet Cove region.

Officers elected for the ensuing year are as follows:

President, Dr. Hugh H. Hyman, Henderson State Teachers College.

Vice-president, Professor W. C. Munn, Magnolia A. and M. College.

Secretary, Dr. Lewis M. Turner, University of Arkansas.

Treasurer, Dr. William R. Horsfall, Monticello A. and M. College.

Editor, Professor M. Dennison, Henderson State Teachers College.

The meeting next year will be at Monticello A. and M. College at Monticello.

Lewis M. Turner,
Secretary

THE SOUTH DAKOTA ACADEMY OF SCIENCE

The twentieth annual meeting of the South Dakota Academy of Science was held at Dakota Wesleyan University, Mitchell, South Dakota. The attendance was unusually good. Twenty-nine papers were read by members. The guest speaker was Dr. J. Howard Mathews, director of the course in chemistry at the University of Wisconsin, who spoke on the subject, "The Use of Scientific Methods in the Detection of the Criminal."

The following officers were elected for the year 1935–36:

President, Wm. H. Powers, South Dakota State College.

First Vice-president, Gregg M. Evans, Yankton College.

Second Vice-president, Charles A. Hunter, University of South Dakota.

Secretary-treasurer, A. L. Haines, University of South Dakota.

A. L. Haines,
Secretary-Treasurer

SCIENTIFIC APPARATUS AND LABORATORY METHODS

A NEW MATERIAL FOR CORROSION PREPARATIONS

Corrosion preparations have yielded a great deal to our knowledge of the vascular system and to our knowledge of hollow organs. The general technique and the limitations of the method are fairly well defined through many years of use. To state the procedures briefly, a vessel or cavity is first filled with a solidifying mass and then the soft tissues, or both the soft tissue and bone, surrounding the mass, are removed.

A wide variety of solidifying masses have been used; waxy or fatty masses, alloys of low fusion point and masses prepared from guncotton. These guncotton masses have found considerable favor because, in contrast to the metallic or wax masses, they may be injected cold. Further, they are commonly less fragile than the wax masses and more complete than the metallic injections. Originally introduced, at least into the literature, by Schiefferdecker[1] with the use of celloidin, the materials have been widely altered. One common method, especially about hospital laboratories, is to make use of discarded x-ray films as a base for preparing the mass. In 1929, at the meeting of the American Association of Anatomists at Rochester, I demonstrated the use of the then recently introduced brush pyroxylin lacquers in the preparation of corrosions.[2] The arteries of the white rat were used for demonstration. Such fine details as the glomeruli of the kidney were beautifully shown. The use of these commercial lacquers had the advantage that the pigments were already provided. The disadvantage was that the solvent was not completely miscible with water, and as a result the mass would set slowly. Recently these lacquers are no longer readily available, except through the automobile paint trade. Various modifications have been tried, such as allowing these commercial lacquers to solidify in air and then suspending the solids in acetone. The results are satisfactory, but the method is troublesome.

The disadvantage of pyroxylin masses had always been due to the low percentage of concentration that it was possible to use. This resulted in great shrinkage, particularly noticeable in the larger blood vessels. The working rule of those who have pursued the corrosion method has always been to use wax or metal for studying larger structures and pyroxylin masses for studying the finer ramifications.

This difficulty of shrinkage has been in part overcome, and a very satisfactory and easily working mass has been simply obtained by using one of the guncottons devised for the lacquer industry. Use has already been made of low viscosity guncotton for microscopic technique.[3] The feature of this material is that a solution containing approximately 50 per cent. solids can

[1] Schiefferdecker, *Arch. Anat. Phys.*, 1882; *Anat. Abt.*, p. 201.

[2] *Anat. Rec.*, 42: 1, March, 1929.

[3] Saul Ruby, *Anat. Rec.*, 55: sup. 74, 1933.

be injected with a hand syringe. The particular material used is "dehydrated nitrocellulose, RS ½ second, viscosity 3.2," obtainable from Hercules Powder Company of Wilmington, Delaware. The lower viscosity product, designated as "RS 18–23 cps.," has also been used, but the resulting preparations are too brittle for practical use. The mass is made up as follows:

nitrocellulose (Hercules RS ½ second)	1,000 grams
acetone (technical grade)	1,000 cc

Solution is accomplished in about twelve hours. The mass may be colored with artists' oil pigments, which are conveniently put into the mass by working up with a small quantity of dioxan.[4] English vermillion is particularly suitable as a color. Acetone soluble stains are much easier to use. Of the microscopic stains commonly available, toluidin blue gives a fairly satisfactory mass and fat soluble brilliant red gives a usable red. These may be dissolved in the acetone before the mass is made or may be added in small quantity of solution subsequently.

Maceration is accomplished as usual, either in concentrated technical hydrochloric acid or by this acid slightly diluted—one part water to five parts acid. If it is desired to retain the bone, maceration in water at body temperature is carried out.

The nitrocellulose as furnished contains 30 per cent. alcohol. With the repeated opening and closing of the container, some of the alcohol is lost; therefore, less quantity of the solid can be used. Moreover, the mass above given represents the maximum viscosity which it has been found practical to inject. Dilution should be practiced as required.

With this material corrosions of the entire vascular system of the adult head have been made, both with and without the destruction of the bone.[5] The material is sufficiently solid so that the corrosions may be handled dry with little fear of breakage. However, they are being mounted in distilled water containing a small amount of formaldehyde.

The costs of the materials used are at this time as follows:

nitrocellulose—10 lb. quantities		$4.08
acetone, technical—5 gal. lots (30 lbs.)	@	.20½ lb.
hydrochloric acid, technical—per carboy (115 lbs.)	@	.05½ lb.

It requires about three days to macerate an adult head. However, sometimes a fourth day with fresh acid is necessary. Small specimens macerate over night.

OSCAR V. BATSON

GRADUATE SCHOOL OF MEDICINE
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SPECIAL ARTICLES

ABSORPTION OF NITRATES BY CORN IN THE DARK

THE effect of light and dark on plants is outside the writer's field of work; but some years ago he blundered into the experiment described below after a discussion with H. A. Allard concerning the "length of day" effect on plants. The question arose whether plants normally absorb ions in the dark. Curiosity on this point was not satisfied by texts on plant physiology; hence an experiment was performed with corn, using nitrate as the ion whose absorption was to be measured. Several previous investigations show that a small amount of nitrate may be absorbed in the dark by plants kept continuously in the dark, but these studies do not show what takes place in plants growing naturally. In the following experiment the plants were grown under the normal condition of an alternation of light and darkness.

Corn plants were grown in nutrient solutions with 7 hours of light and 17 hours of darkness each day. Solutions were renewed or changed twice daily, at the beginning and end of the light period. There were two check lots that received uniform treatment in both light and dark; one was supplied with a complete nutrient solution in both periods and the other with a solution lacking only nitrate. A third lot received the nitrogen-free solution in the light and the complete solution in the dark, while the fourth lot received the complete solution in the light and the nitrogen-free in the dark. The plants were grown in this way for 12 days and then analyzed. Seedlings used in installing the experiment were previously grown for 7 days in a nitrogen-free solution to produce a nitrogen deficiency. Plants receiving nitrate at any period made a good growth and were normal in appearance. Data on growth and nitrogen assimilation are given in Table 1. The experiment is doubtless entitled to more confidence than indicated by the probable errors of the average weights, since, when the experiment was installed, the seedlings were selected for uniformity by fours, one for each treatment; as a result, the 12 seedlings receiving the same treatment were quite variable in size.

The data show quite plainly that corn grown under alternating periods of light and dark is capable of assimilating nitrate fully as well in darkness as in

[4] H. W. Mossman, *Anat. Rec.*, 58: 4, supplement, March, 1934.

[5] A series of specimens so prepared was demonstrated at the College of Physicians, Philadelphia, Pa., January 16, 1935.