from the other sources mentioned above sometimes required addition of carbon dioxide-free ethanol in order to cause crystallization.

Arginine absorbs carbon dioxide from the air, but this may be driven off by boiling the solution of recrystallization.

SIDNEY W. FOX
WILLIAM G. KERCKHOFF LABORATORIES
OF THE BIOLOGICAL SCIENCES,
CALIFORNIA INSTITUTE OF TECHNOLOGY

FAILURE OF ALFALFA TO PREVENT THE HEMORRHAGIC SWEETCLOVER DISEASE[1]

IN 1922, Schofield[2] showed that the feeding of poorly cured sweetclover hay may induce in the bovine a disease characterized by a diminished clotting power of the blood. The disturbance of the clotting mechanism has since been found to be due to a deficiency in prothrombin.[3,4] Continued administration of a toxic diet results in severe, usually fatal hemorrhage.

In a recent paper on one phase of this problem, Quick[5] concludes from experiments with rabbits that "Diet is the important means for controlling the disease. The incorporation of 5 per cent. of dehydrated alfalfa meal with the toxic hay was found sufficient to prevent the development of the disease or even any demonstrable reduction of prothrombin." It is also stated that "The animal appears to be able to store this accessory factor [from alfalfa], for it is very difficult to produce sweetclover disease in animals that have been fed relatively large amounts of alfalfa. This explains why some animals are far more resistant than others to the same lot of spoiled hay." Quick points out the practical significance of these conclusions and suggests the relation of this accessory factor to the anti-hemorrhagic vitamin K which is required by the chick for normal blood coagulation and is present in alfalfa. These conclusions, of significance in agriculture and in studies of factors affecting the mechanism of blood coagulation, are not in agreement with the results of our experiments with rabbits. The details of these experiments will be recorded elsewhere, but the salient features will be presented at this time.

We have found no indication that alfalfa exerts a protective action against the sweetclover disease. Rabbits have been fed alfalfa to the amount of 50 per cent. of the diet along with toxic hay and toxic extracts. Nevertheless the symptoms of the disease have appeared. Freshly cut alfalfa constituting 12.9 per cent. (dry weight) of the ration and kiln-dried alfalfa constituting 10 per cent. each in a diet of toxic hay failed to inhibit the action of the toxic principle. Likewise a commercial alfalfa hay of excellent quality when incorporated to the amount of 10 per cent. in a toxic hay was ineffective in checking the onset and fatal termination of the disease.

A marked variation within a group of rabbits of similar age in reaction to a given toxic hay has been observed in our experiments. Animals found susceptible in a preliminary test on a uniform diet have maintained their susceptibility in further subjection to the action of the toxic principle. In like manner resistant animals in as far as they have been tested have been resistant in later trials on the same hay. Furthermore, no significant differences have been observed between groups of rabbits having had alfalfa or no alfalfa during the period prior to a test on toxic hay. These and related considerations arising from experiments on some 150 rabbits suggest that the variation in a group of rabbits in reaction to a given toxic hay is due to the inherent characteristics of the animals; there is no evidence in our experiments that the variation results from previous feeding.

WILLIAM K. SMITH
BUREAU OF PLANT INDUSTRY AND
UNIVERSITY OF WISCONSIN

SCIENTIFIC APPARATUS AND LABORATORY METHODS

STATIC ELECTRIC PROPERTIES OF A NEW BAKELITE PLASTIC

RECENTLY the Bakelite Corporation has put on the market a new plastic designated as polystyrene XMS–10023. It was described as an excellent electric insulator. In the search for some material that could be used as insulator in static electric experiments the writers tested this material by electrometric methods. While amber has all the desirable properties for an insulator it is rather expensive and, particularly, not easily obtainable in larger dimensions. XMS–10023 can be molded readily into any given shape without restriction as to size.

The electric resistivity was compared to that of amber and of a shellac-coated hard rubber, with the approximate relative results shown in the following table:

[1] Contribution from the Department of Genetics (Paper No. 226), Wisconsin Agricultural Experiment Station in cooperation with the Division of Forage Crops and Diseases, Bureau of Plant Industry, U. S. Department of Agriculture. Cooperative investigations with the Biochemistry Research Laboratory, Department of Agricultural Chemistry, Wisconsin Agricultural Experiment Station.

[2] F. W. Schofield, *Can. Vet. Record*, 3: 74–78, 1922.

[3] L. M. Roderick, *Am. Jour. Physiol.*, 96: 413–425, 1931.

[4] A. J. Quick, *Jour. Biol. Chem. Proc.*, 114: lxxxii, 1936.

[5] A. J. Quick, *Am. Jour. Physiol.*, 118: 260–271, 1937.

Amber	1
XMS–10023	1: 3
Hard rubber	1: 50–140

If, therefore, amber has a resistivity of $10^{-18}\Omega$/cm, XMS has about $3\times10^{-17}\Omega$/cm. The new material ranks very close to amber in its insulating qualities and will in many cases be a very good substitute for it. Its resistivity is equal to or perhaps a little higher than quartz, but the ease of molding it will make it superior to quartz. Whereas amber insulators are usually flamed to remove surface charges, XMS–10023 will charge itself when brought into the flame. Cleaning with alcohol will suffice to make it ready for use.

For atmospheric electric and Radon measurements the qualities of this plastic seem to be quite satisfactory.

H. LANDSBERG
A. I. INGHAM
THE PENNSYLVANIA STATE COLLEGE

A NEW METHOD FOR MARKING SMALL LABORATORY ANIMALS

VARIOUS methods are utilized in different laboratories to facilitate the identification of individual animals. Large mammals, such as cats, dogs and rabbits, are frequently kept in individual living cages and under such conditions identification marks may not be needed. This is not always the case when an experimenter is using rats as his subjects. In many laboratories from ten to one hundred rats are kept in the same living cage and it is always useful and frequently essential to be able to select accurately one particular animal from this number.

Perhaps the most popular method of marking rats is that of mutilating the ears. Usually the ears are notched or perforated with a small punch. A third and less common procedure is to amputate the toes of the hind feet in various combinations, and even to cut off a portion of the tail. All the above methods have serious drawbacks if they are to be applied to a large number of rats which are to be marked for a long period of time. In addition to difficulties arising from healing and regeneration of the mutilated tissue, any one of these methods involves the necessity of teaching laboratory assistants the pattern of combinations used to designate the various numbers.

The writer has found that one extremely simple and practical method of marking rats is to tattoo the identification numbers in the ear. The principle of the machine used is very simple and the laboratory worker can construct his own tattooing outfit. However, machines can be purchased so cheaply that it is scarcely worthwhile to attempt their construction. A machine used to mark rats in this fashion can be purchased in any large city for $3 or $4 in an establishment where tattooing is performed. The apparatus is that used to tattoo designs in human flesh. The most satisfactory material for putting the numbers in the ear is india ink.

In the writer's laboratory are several animals with identification numbers tattooed in their ears six months previously. These marks show no signs of fading, and experience with designs tattooed in human skin indicates that a number once tattooed into the rat's ear will remain legible throughout the animal's lifetime. The application of this method of marking is of great assistance if one wishes to keep a genetic record in connection with breeding in the colony. Young rats can be marked for life at the time of weaning.

FRANK A. BEACH, JR.
AMERICAN MUSEUM OF NATURAL HISTORY

THE USE OF COTTON TO ABSORB BLOOD FOR CHOLESTEROL EXTRACTION

THE determination of cholesterol in blood with the micro extraction apparatus previously described[1] is facilitated by substituting absorbent cotton for the filter paper. A quantity of absorbent cotton is washed several times with fresh portions of chloroform and dried in the air to remove fatty contaminants. A small piece of cotton is tamped into the extractor with a glass rod. The upper end of the cotton should be about 2.5 cm from the open end. The tip of the blood-filled pipette is firmly pressed into the cotton, which then absorbs the blood quantitatively. A second, smaller piece of cotton is tamped against the blood-soaked cotton, and the drying and extraction are performed according to the original directions.

The apparatus now has a cylindrical glass shield. This protects the extraction tube from draughts and permits the operation of the heating element with a smaller current, thereby prolonging its life.

E. M. ABRAHAMSON
BROOKLYN, N. Y.

[1] SCIENCE, 86: 477, 1937.

BOOKS RECEIVED

CRATHORNE, A. R. and E. B. LYTLE. *Trigonometry.* Pp. ix + 95. 139 figures. Holt. $2.00.

CURTMAN, LOUIS J. *Qualitative Chemical Analysis.* Revised edition. Pp. xii + 514. 44 figures. Macmillan. $3.75.

ECKELS, CHARLES F., CHALMER B. SHAVER and BAILEY W. HOWARD. *Our Physical World.* Pp. xi + 801. 436 figures. Sanborn.

ELDERTON, W. PALIN. *Frequency Curves and Correlation.* Third edition. Pp. xi + 271. Cambridge University Press, Macmillan. $3.75.

HOGNESS, T. R. and WARREN C. JOHNSON. *Elementary Principles of Qualitative Analysis.* Pp. x + 325. 27 figures. Holt. $1.40.

Organon; International Review, II. Pp. 302. Mianowski Institute for the Promotion of Science and Letters, Warsaw.

WEST, GEOFFREY. *Charles Darwin.* Pp. xiv + 359. 8 plates. Yale University Press. $3.50.

WOLFENDEN, J. H. *Numerical Problems in Advanced Physical Chemistry.* Pp. xx + 227. Oxford. $2.75.