that have been decerebrated by the method outlined have survived indefinitely, presenting typical pictures of decerebrate birds.

A preliminary fasting period of from eighteen to twenty-four hours was imposed upon the bird previous to operation.

The hen was secured in a cloth sack, the head and neck protruding, and anesthetized with ether. Feathers were plucked from the operative area from ear to ear and from the comb posteriorly to the first cervical vertebra. A transverse incision was made through the skin from ear to ear and the periosteum removed from the bones covering the cerebral hemispheres. Two holes were trephined over the center of each hemisphere, and with small bone forceps, the openings were enlarged, care being taken not to injure the dura mater, also carefully avoiding the longitudinal sinus. The dura mater was slit anteroposteriorly, after applying a solution of codrenin (cocaine 2 per cent. solution, with adrenalin 1:15000) to control hemorrhage. Using a small spatula the cerebral hemispheres were lifted, care being taken not to injure the brain stem. After the hemispheres were removed, hemorrhage was checked by using pledgets of cotton moistened with codrenin. Because of the larger blood supply, the control of hemorrhage is more of a problem in fowls than in pigeons. The usual procedure in decerebrating pigeons is to suture the dura mater and skin. This procedure was followed upon the first four birds operated, all these birds dying immediately following the operation. Autopsies of these birds revealed that death resulted from the pressure of blood clot upon the vital centers. Therefore, in all succeeding operations no attempt was made to suture the dura mater and skin. Extended over a period of two years fifty-four birds have been operated, the cerebral hemispheres being removed partially or completely. No ill results occurred from blood clot or from infection of operated areas, all birds surviving for indefinite periods.

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MARKING GEOLOGICAL SPECIMENS

DURING the past year we have very successfully used quick-drying lacquer for marking specimens both for use in elementary laboratory and for numbering working and museum collections. The process is simple, consisting only of placing a drop of lacquer on the specimen and writing upon it the significant letters or figures with steel pen and drawing ink.

The advantages in using lacquer over many other methods of specimen marking are several. It is permanent; it provides a smooth writing surface, and it can be secured in colors which may be used to indicate different sets, classes, groups or other divisions. The method is quick, drying after spotting, and marking being accomplished within half an hour. The colors may be contrasting with the specimens marked or closely matched to them. We have found a contrasting color ordinarily the most satisfactory, in most cases using white or orange with lettering in black ink.

The use of lacquer makes possible the marking of specimens which would otherwise be difficult. A deep drop may be used to cover granular or rough surfaces, and even when applied in considerable depth there does not appear the wrinkling or furrowing such as is common with the usual enamels. A single application has served to form a satisfactory writing surface on coarsely granular pyrite. The size of the lacquer spot commonly used is about three sixteenths of an inch in diameter, and is applied with a small brush. A spot of this size holds conveniently a letter and two figures, or two pairs of figures, one above the other.

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SPECIAL ARTICLES

ON THE NATURE OF GENE ACTION

THAT the structural units which give form to life, as we know it, are the inherited units called genes is becoming increasingly clear. But what these genes are and when and how they act are yet problematical. Experiments of the last two years have, however, furnished certain facts suggesting the answers to these questions. These facts resulted from treating the larvae of Drosophila with X-rays at timed stages in their development in much the same manner as that used by Patterson.[1] The larvae for the treatments were in groups less than twenty-four hours old, one to two days, two to three days, three to four days—seven to eight days. Flies showing changes were obtained only in the three-day-old group. The four pairs of chromosomes present in the individuals treated were made to have the following known genes: One sex chromosome had the genes for white eye color, miniature wings and beadex wings, the other X-chromosome was wild type; one second chromosome had the wing gene for curly, its mate was wild type; one third chromosome had the genes for the eye colors scarlet and claret, and gene mutomat causing greatly reduced crossing-over in all chromosomes,

[1] J. T. Patterson, "The Effects of X-rays in Producing Mutation in the Somatic Cells of *Drosophila melanogaster*," SCIENCE, 68: 41–43, 1928.