although it was more dilute than the original filtrate. A repetition of the experiment duplicated the results.

Before using the dialyzing tubes they were tested with distilled water and apparently did not leak.

From these experiments it would appear that this particular mushroom contains a very active soluble tyrosinase which is either not colloidal or is so decidedly on the borderland between the crystalloidal and colloidal states as to invalidate a general application of the Willstätter conception.

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THE SECRETION OF ADRENALIN

THERE has been a great deal written on the subject of adrenalin reviving people after death. Dr. W. H. Schultz, of the University of Maryland, read a paper at the recent Physiological Congress in Boston showing that the factors ordinarily controlling the normal growth of adrenalin-secreting cells may be defective, in some instances, in a way that will make the gland capable of storing up adrenalin. Even thirty to fifty times the normal amount may be stored and if it is suddenly released can poison and even kill. Should one thousandth of the amount be suddenly released it would cause high blood pressure, whereas one hundredth of the amount would cause death.

It was chemical and biological studies that laid the foundation for the hospital treatment of hyperthyroidism—a dangerous disease involving questions of metabolism. Similarly this work lays a scientific foundation for hospital treatment of certain types of blood pressure.

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SIMON'S "LES ARACHNIDES DE FRANCE"

ALL students of the Arachnida will welcome another instalment (Part 3) of the long-awaited sixth volume of Eugene Simon's "Arachnides de France." This is a posthumous work carefully edited by his devoted colleagues, L. Berland and L. Fage. Simon began the publication of this great work in 1874, and the fifth volume was completed in 1884, volume 7, devoted to the Pseudo-scorpions and Opiliones, having been published in 1879. It was originally intended that volume 6 should treat of the families not considered in the previous volumes, but with the passing of the years while the author was busied with the preparation of his great work on the genera of the spiders of the world, this plan was abandoned. Instead, volume 6 was projected as in reality a new edition of the series; the earlier work was to be revised and brought down to date while the families which had been omitted were to be treated. Part I of the volume was published in 1914; the war intervened and at the time of Simon's death in 1924 no more had appeared. Fortunately, the manuscript was complete and the task of seeing the work through the press had been delegated to the present editors. By carefully executing this mission they have won the gratitude of all students of spiders throughout the world.

The present instalment, pages 533–772, completes the treatment of the family Argiopidae. The publisher is L. Mulo, Paris.

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HERMAPHRODITISM IN DENDRASTER

HEILBRUNN[1] has very recently reported in this journal two hermaphroditic specimens of Arbacia from Woods Hole. This increases the list of hermaphrodite echinoderms to five, two of Paracentrotus having previously been described by Herlant[2] and by Drzwina and Bohn,[3] respectively, and one of Sphaerechinus by Viguier.[4] While engaged in physiological investigations on the eggs of *Dendraster excentrica,* we found a hermaphroditic sand-dollar, the gonads of which were symmetrically divided into testicular tissue on the right of a diameter passing through the anus, and ovarial tissue to the left of it. The eggs were in better condition than the spermatozoa, and self-fertilization did not seem to be possible. As the first instance of hermaphroditism in the clypeastroid echinoderms, this circumstance may be worth record.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

DECEREBRATION OF THE DOMESTIC FOWL

THE domestic fowl has been little used in laboratory decerebration experiments because of the exceptionally high mortality that has accompanied such operations. Since there are obvious advantages in the use of the larger-sized bird, the following summary of procedure is presented in the belief that the method would be of interest. Domestic fowls

1 SCIENCE, 69: 427, 1929.
2 *Archives de Zool. Exp. et Gen.,* 57: 28, 1918.
3 *Comptes Rend. Acad. Sci.,* 178: 663, 1924.
4 *Comptes Rend. Acad. Sci.,* 131: 63, 1900.

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.