combining the .1 fragment with the double half chromosome 2.2 and eliminating entirely the normal 1.2 chromosomes. When homozygous for both the .1 and 2.2 chromosomes the plant has two extra doses of the .2 half and takes on the characteristic appearance due to the extra chromosomal material. The third type with two extra doses of the .2 half was secured by rendering a plant homozygous for the following chromosomes;—2.14, 13.23, and the .24 fragment and eliminating the normal 13.14 and 23.24 chromosomes. The first type has 24 chromosomes, the other two have 26 and thus differ from normals in chromosome number. These three types are indistinguishable in gross appearance from each other, but are strikingly different from the normal jimson weed from which they have been made up to order, as it were, with definite plan and purpose. They perhaps merit the term of synthesized new "species," since they satisfy the criterion of breeding true and are more different from the normal type than some of the species which already have been described in the genus Datura.

The lipids and proteins of the colon bacillus. A study in bacterial synthesis: H. C. ECKSTEIN and MALCOLM H. SOULE (introduced by F. G. Novy). *B. coli* (Jordan) was cultured on synthetic media under aerobic as well as strict anaerobic conditions. The media were fat free, contained glucose and either cystine or alanine as the only source of nitrogen. The chemical nature of the proteins and lipids was determined. The lipids synthesized were characterized by their small content of unsatured fatty acids and rather large content of the phospholipids. The proteins contained tyrosine, tryptophane, arginine, histidine and lysine, regardless of the type of media or gaseous environment. Cystine was not synthesized.

Further studies on the feather germ reaction as a test for thyroid hormone: BRODA O. BARNES (introduced by A. J. Carlson). Juhn and Barnes[1] described a new indicator for thyroid preparations which involved subcutaneous injection of a small amount of thyroxine or thyroglobulin into a brown leghorn capon. The result was a deposition of black pigment in the feather germ of young feathers, which left a permanent record of the injection. It has been found that this indicator will differentiate between active and inactive iodine in the thyroid gland. Considerable variation occurs in the width of the pigmented area using the same dose in different birds. The minimal dose necessary for a positive response lies between 0.3 and 0.4 mgs. of thyroxine.

Biological significance of protective mechanisms inherent in the myocardium: CARL V. WELLER (introduced by F. G. Novy). The myocardium exhibits certain protective mechanisms which are seemingly inherent, and which are not possessed in the same measure by many other tissues of the human body. One of the most obvious of these is dependent upon the pattern of the arterial supply, resulting in an admixture of living and dead tissues, rather than a continuous area of necrosis, following the lesser occlusive lesions. Less easily explained is the comparative freedom of the myocardium from hematogenous metastases of malignant tumors. Similarly, in visceral syphilis there may be an extremely active aortitis, with spirochetes present in large numbers, yet the myocardium may show little or no change. Perhaps the most striking example of all is found in the inability of young trichinae to encyst in heart muscle, although a defensive myocarditis is produced by them. From such diverse examples one must conclude that these protective mechanisms are of biological significance and that they have been developed and perpetuated in order to maintain, in so far as possible, the integrity of the myocardium, so essential for the preservation of the organism.

Higher processes in the behavior of rats: JOHN F. SHEPARD (introduced by W. B. Pillsbury).

Notes on the eclipse table in the Dresden Codex (Maya hieroglyphic manuscript): CARL E. GUTHE (introduced by W. B. Pillsbury). On pages 51 to 58 of the Dresden Codex there exists a chronological table covering a period of 11,960 days or 405 synodic lunar months. The individual members of the table are six-month intervals regularly interrupted by a five-month interval. The table consists of three almost identical equal parts of 135 months each. The arrangement of this record clearly indicates that the Maya were acquainted with the periodicity of eclipses. The efforts of many students have disclosed a series of interesting relationships between this table and other Maya chronological units as well as periodical astronomical phenomena. Several unsuccessful attempts have been made to fit this table into a particular group of data in the hope of establishing a day-for-day correlation between the Maya and the European chronologies. Through an examination of the data on both solar and lunar eclipses visible in the Maya area, considered in terms of whole days (the Maya chronological unit), it becomes evident that this table is a compendium of information upon both solar and lunar eclipses in terms of synodic lunar months and that it could have been constructed from data secured by observation over a relatively short period of time.

SCIENTIFIC APPARATUS AND LABORATORY METHODS

A DELTA METHOD FOR STUDYING MICROSCOPIC SEDIMENTS

FOR twenty years I have had a practical interest in microscopic sediments because they have interfered more or less seriously with my examination of plankton catches in a Sedgwick-Rafter counting chamber. In the last few years I have given considerable attention to papers discussing them in the hope that I

[1] Juhn and Barnes, *Amer. Jour. Physiol.*, 98: 463, 1931.

might get some light on the peculiar features of flotation and settling phenomena of plankton diatoms in sea water.

While my survey of the literature of sedimentation has not been comprehensive, it has been fairly representative, and I have been surprised that no mention has been made of the use of delta formation in the study of microscopic sediments. It has been many years since I first noticed the formation of deltas deposited in the process of filling Sedgwick-Rafter chambers, and it seems to me that any one caring to experiment a little could get excellent results by studying microscopic sediments through use of the delta principle.

I have been too closely occupied with my own routine to give much attention to the possibilities of the method, but I have tried it out a little with a sediment consisting mostly of particles which sank at high speed. With this material injected into a jar of water from a pipette bent to throw the particles directly horizontal at a height of about one inch from the bottom of the jar, I got a delta formation which seemed to have the particles sorted out to about the extent commonly seen in case of the larger particles composing an alluvial fan at the bottom of a moderate slope.

I believe that a little experience would enable one to regulate the height of the jet of sediment above the bottom, the distance from the sides of the vessel, the speed of flow from the jet and the volume of the jet so that the components of a mixed sediment would be fairly well separated in the delta. It appears also that the position of a particular type of particles in a delta formed under known conditions of distances, viscosity of fluid and speed and volume of the jet might provide an index to their rate of settling, as compared with other particles for which the rate may have been determined.

In addition it seems probable that by use of a beam of light thrown to particular or different points in front of the jet in a tall vessel the spread of particles from the jet and their processes of sinking might be followed and a more accurate understanding of their sinking behavior obtained than seems to be available at present. By using fluids of different viscosities for comparison, it might be possible, perhaps, to reach results of fairly high accuracy in this way.

W. E. ALLEN

SCRIPPS INSTITUTION
LA JOLLA, CALIF.

A NEW USE FOR CELLOPHANE

IT is sometimes convenient to make records of a permanent nature which can be reproduced on a screen by an arc lamp projection lantern. This can be accomplished in a very simple way at very low cost. Briefly, it is a method of typing on cellophane.

Cellophane is placed upon the carbon side of a sheet of carbon paper, which is placed in a typewriter with a backsheet to protect the rubber roll. Next the typewriter ribbon is adjusted the same as in the making of stencils. The letters which are produced in this way are dark and sharply defined. If a permanent record is to be made, the cellophane is placed between two pieces of glass cut to the size of projection lantern plates. If some discarded lantern plates are available, place them in water for a short time and then the emulsion can be scraped off. The pieces of glass are then sealed around the edges with mending tape. If the record is not of a permanent nature, the cellophane can be used between the plates without the necessity of the plates being sealed.

In making a graph the procedure is the same, with the exception that the graph is drawn on the cellophane with a pencil. The pencil will not mark, but a clear record is obtained from the carbon paper.

Care should be exercised in handling the cellophane, as the completed work can be rubbed off with the hands.

This method has proven satisfactory in the reproduction of the words of songs for chapel exercises and in the making of blueprints and in the drawing of graphs and diagrams to be used during an illustrated lecture when it is impossible to have the use of a blackboard or when a blackboard is not available. These are a few of the uses to which this work is adapted.

KENNETH LYLE WARREN.

DEPARTMENT OF PHYSICS
BATTLE CREEK COLLEGE

A NEW MEDIUM FOR BAS-RELIEF MOLDS

DURING the past spring the science department of the Fountain Valley School of Colorado carried on a series of experiments at Chichen Itza, Yucatan, through the courtesy of Dr. Sylvanus G. Morley, of the Carnegie Institution. These were to determine a technique for rapidly making accurate and durable paper casts of the Mayan bas-reliefs in stone. The material selected for trial was a stereotype wet mat, known as "Nu Tex D," supplied through the courtesy of the Burgess Cellulose Company, of Freeport, Illinois.

After the usual run of failures and half-successes a successful technique was developed. The mats were soaked in water at 85° F—the temperature of the available supply—for several hours. They were then split so that the treated surface of the mat was backed