College during the next college year as a memorial to T. Allen Hilles, of Wilmington, Del., a graduate of the class of 1870.

A CHECK for $50,000, the gift of Cyrus H. K. Curtis, of Philadelphia, to Milwaukee-Downer College has been presented to the board of trustees to be used for the equipment of the science building now under construction.

DR. HENRY SPENCER HOUGHTON has been appointed dean of the Medical School of the Iowa State University.

DR. FREDERICK H. HOWARD, professor of physiology at Williams College, has been appointed professor of physiology at the College of Physicians and Surgeons, Columbia University.

AT the University of California, E. O. Essig has been appointed professor of entomology and entomologist of the Agricultural Experiment Station. Dr. Edwin C. Van Dyke has been appointed professor of entomology.

DR. MATILDA MOLDENHAUER BROOKS, formerly associate biologist of the Hygienic Laboratory at Washington, D. C., has been appointed research associate in biology at the University of California.

DR. THEODORE KOPPANYI, of the department of physiology of the University of Chicago, has been appointed assistant professor of pharmacology in the college of medicine at Syracuse University.

PROMOTIONS in the department of chemistry of the University of Pittsburgh have been made as follows: Drs. H. E. Woodward, F. Y. Herron and J. N. Roche, from graduate assistant to instructor; in the department of physics, Dr. Oswald Blackwood, from associate professor to professor, and Dr. Elmer Hutchisson, from instructor to assistant professor; in the department of botany, Dr. A. B. Wallgren, from assistant professor to associate professor.

THE vacancy in the electrical engineering faculty of Case School of Applied Science, created by the death of Dr. Huxley, will be filled by Dr. P. L. Hoover, research fellow in electrical engineering at Harvard University, who has been appointed assistant professor of electrical engineering.

PROMOTIONS at Yale University include the following: Dr. Edwin H. Lockwood, Robert Higgin professor of mechanical engineering; Dr. James D. Trask, associate professor of pediatrics; Dr. Willard B. Soper, associate clinical professor of medicine; Dr. Edwin J. Fisher, assistant professor of chemistry; Dr. Sidney M. Newhall, assistant professor of psychology, and Dr. Albert F. Hill, assistant professor of botany.

DISCUSSION AND CORRESPONDENCE

THE INFLUENCE OF ADRENAL EXTRACTS ON THE SURVIVAL PERIOD OF ADRENALECTOMIZED DOGS[1]

UNTIL it has been shown that any adrenal extracts whatever possess the power of definitely increasing the period of survival after removal of the adrenals, the assumption that the cortex produces a "hormone" (which might appropriately be termed interrenalin) must lack a foundation, and attempts to isolate and purify such a body can hardly be made with confidence. We have used extracts, made from dog's fresh adrenals with 0.9 per cent. salt solution and glycerine. The clear extracts were injected intravenously on alternate days. The injections produced no obvious ill effects.

The only criterion at present at our disposal to determine the efficacy of an extract is its effect on the survival period. This is a very severe test because of the fact that all the important derangements which eventually lead to death must be neutralized by the substance. If changes not of themselves causing death could be associated with the loss of the adrenals, it might be easier to obtain evidence of the existence in extracts of a body or bodies capable of preventing them.

It is obvious that in drawing conclusions as to the effect of any method of treatment upon the period of survival, it is essential to have a sufficiently large number of "control" animals. We have accumulated more than a hundred control dogs, so that it may be said with confidence that we know the limits of the survival period in dogs doubly adrenalectomized and not subjected to any treatment. Of course, this series of control animals is necessary and available for many other researches. The majority of the animals lived about a week to 10 days, a good many less than a week. About 8 per cent. survived a fortnight or somewhat longer. The longest survival period was 16¼ days (one dog).

Among about 30 dogs treated with extracts, one lived into the 18th day, one into the 20th day, one into the 22nd day, one into the 23rd day, one into the 28th day, and one survived 78 days after removal of the second adrenal. Nothing like those results were seen among the much larger number of control dogs. It is impossible to draw any other conclusion than that the extracts in some way prolonged the life of the animals in the absence of the adrenals. The rest of the treated animals compared favorably with the controls as regards duration of survival. As the extracts injected into the different animals were often obtained from different adrenals, it is easily understood that their potency would vary.

[1] From the H. K. Cushing Laboratory of Experimental Medicine, Western Reserve University.

There is no reason to suppose that the epinephrin, present in larger or smaller amount in the extracts, could have had any appreciable influence in prolonging life. No effect of this kind was observed when epinephrin equal to the maximum amount which could have been contained in the dose, given on the assumption that none of it had been destroyed, was injected. Much of the epinephrin was destroyed in making the extract.

J. M. ROGOFF
G. N. STEWART

WESTERN RESERVE UNIVERSITY

AN INQUIRY INTO THE MOTION OF DROPLETS OF JUICE EJECTED FROM AN ORANGE[1]

WHEN an orange is divided into hemispheres and eaten with a spoon, it has often been observed that droplets of the juice emerge and proceed with extraordinary rapidity and uncanny accuracy into the eye of the observer. The phenomenon is a subtle one and explanations which have been offered are conflicting, so that recently certain experiments have been undertaken with a view to its elucidation. Although much remains to be done, it is believed that the results obtained are of sufficient importance to warrant a preliminary report at this time.

Earlier observations in this field, rather sketchy perhaps, may be mentioned briefly. Adam[2] is recorded as saying "damn" violently at the breakfast table (with, of course, the inevitable remonstrance from Eve). This may be regarded as very precise evidence that the oranges of that epoch delivered their droplets with unerring aim. Although the conditions were not quite the same the fact was evidently well known to Atlanta[3] who dropped oranges (the Greek word is ωραμσε, wrongly interpreted by the commentators as "apple") in the path of her competitors in races, thereby removing them from the competition. More recently the Spanish Dons were wont to present oranges to their ladies with a view to rendering them incapable of choosing other partners. In the late war no doubt only the high visibility of oranges prevented them from being used in the most bitter offensives.

In the present experiments a large concave ladle, 2,000 karat, served as a source of energy. The crossed fields were impressed by a cuneiform magnet, the usual precautions being observed when adding the cracked ice. It was soon found absolutely necessary to apply a relativity correction. This was done, however, carefully in Latin so as not to injure any of the finer sensibilities, if there were such present.

The results of the measurements showed that the diameters of the droplets were of the order of 10^{-21} cm, which accounts for their being able to enter the smallest crevice of the eye. Their speeds varied over a considerable range, but on the whole were high, averaging about a tenth of the velocity of light. It was found that the droplets were attracted towards the eye with a force varying with the inverse seventh power of the distance. These facts are all seen to be but details bearing out the surprising frequency with which the droplets steer for the eye, and are best explained by an appeal to the 1st law, *i.e.*, the innate cussedness of inanimate things. An exhausting series of experiments developed the remarkable fact that the right hand invariably propels the droplets into the left eye. A little thought, however, indicated that this was so because the right hand didn't wish the left to know what it was doing.

It is hoped to present in a future paper a mathematical explanation based on the flirtation theory of Einwein and Drinkemoffski.

E. O. HULBURT

WASHINGTON, D. C.

USE AND DISUSE IN THE CHROMOSOMES

THE writer expressed his theory of use and disuse in the chromosomes as an explanation of phylogenetic development in the article "Factors in Phylogenetic Development" in the May–June, 1927, number of the *American Naturalist*. Further study of the principles expressed in this paper has led to the conclusion that the uniformity of genes in the various parts of the body need not be limited to the coordinative forces of the organism, although coordination is an obvious essential to such uniformity.

Since the chromosome complex characteristic of the species persists in most cells of the body, it follows that most cells contain a great number of genes which find no expression within those cells. It seems improbable that the millions of genes in this category are entirely without effect in the expression of inherited characters.

The only logical interpretation of this condition is then that a given character is the product of certain genes not merely in the cells taking part in the expression of the character but throughout the body. According to this view the distribution and influence of genes are not coincident. The development of a cell may be due to the influence of a multitude of genes rather than of one or a few within itself, and consequently any increase in the functional capacity of a gene due to repeated use would be at the outset an attribute of all genes of that kind throughout the

[1] Read before the Royal Society of Sultry Yachtsmen.
[2] Eden "Scientific Papers," 1, 35 (6721 B. C.).
[3] Homer, Canto 7.