

## SCIENCE NEWS

*Science Service, Washington, D. C.*

## THE HORMONES OF THE PITUITARY GLAND

Two new hormones from the pituitary gland, each a twin to already known pituitary hormones, were reported by Dr. Leo Loeb, of Washington University, St. Louis, in an address before the American College of Physicians meeting in Philadelphia following his presentation with the John Phillips Memorial Medal of the college.

The new pituitary hormones act on thyroid and female sex glands, respectively. A species difference in the extracts from the pituitary that influence thyroid and sex glands had previously been recognized. An extract from the pituitary gland of a cow has a stimulating effect on the cow's sex glands but just the opposite effect on the guinea-pig's glands.

Investigations conducted by Dr. Loeb during the past two months for the first time show that this different effect is due to the production by the pituitary of two different hormones with antagonistic effects on female sex glands. In the pituitary glands of cattle, the ovary-stimulating hormone predominates while in pituitary glands of other species of animals the antagonistic hormone predominates.

The presence of these two hormones, where only one was formerly thought to exist, may have a relation to the anti-hormone effect discovered by Dr. J. B. Collip and associates, of McGill University, who have found substances called anti-hormones in the blood of men and other animals.

Dr. Loeb's other recent discovery of two thyroid-stimulating hormones from the pituitary may throw further light on the cause of Graves' disease or exophthalmic goiter, the disease characterized by pop-eyes, rapid pulse and other disturbances. Dr. Loeb and other scientists have been able to produce all the symptoms of Graves' disease in healthy animals by giving them doses of thyroid-stimulating pituitary hormone, which suggests that disorder of the pituitary may be a cause of this kind of goiter. Dr. Loeb is now studying the pituitary glands of persons who died of Graves' disease. He hopes to find which of the two thyroid-stimulating pituitary hormones predominates in these glands, and thus which may be responsible for the development of the disease.

The pituitary gland at the base of the brain, master of all endocrine glands of the body, has another rôle. It is nature's sculptor which models the head, face and features of man. The mechanism by which the pituitary plays this newly-discovered "sculptor" rôle was described by Dr. Hector Mortimer, of McGill University, at the meeting of the American College of Physicians. Finding how the gland acts to change facial features will aid the endeavors of physicians to diagnose and treat disorders of the gland. Dentists will also be aided in their own problems of facial and palatal growth. Scientists have, for years, studied the question of the mode of growth in the human face in an endeavor to solve the question of those changes which make the Mongoloid

features so different from either the Negroid or those of the white race, the Caucasoid.

## VITAMIN C AND RHEUMATIC FEVER

DESPITE recent animal experiments suggesting that lack of vitamin C in the diet might cause rheumatic fever, the vitamin is neither a cure nor a preventive of the disease and apparently has nothing to do with its cause.

First tests of the recent theory on human patients, with the above conclusions, were reported by Drs. Mark P. Schultz, Jules Sendroy and Homer F. Swift, of the Rockefeller Institute for Medical Research, at the meeting at Atlantic City recently of the American Society for Clinical Investigation.

Their studies were made on over one hundred persons. Fifteen were patients acutely ill with rheumatic fever. These were given large daily doses of the vitamin in the form of ascorbic acid by mouth and by injection into the veins and in addition large doses of orange juice. They were also given substances rich in other vitamins. No beneficial effect of this treatment was seen.

Two groups of children, about thirty in each, were examined carefully for several months beginning in mid-winter. Children in one of the groups were given large daily doses of vitamin C in the form of ascorbic acid. Although the children not receiving the vitamin developed a mild degree of scurvy in early spring, there was no difference between the groups as far as the rheumatic disease was concerned. In fact, relapses of acute rheumatic fever occurred in three children who had received the ascorbic acid daily for two to three months.

Careful tests of the use and storage of vitamin C in thirty patients and non-rheumatic persons showed in the rheumatic patients no abnormality in the way the vitamin was handled by the body nor any deficiency in the body's store of this vitamin.

The theory that lack of vitamin C and consequent development of scurvy was a factor in causing rheumatic disease was based on experiments reported by Drs. James F. Rinehart and S. R. Mettler, of San Francisco, two years ago. They produced symptoms resembling human rheumatic disease in guinea-pigs deprived of vitamin C until a mild degree of scurvy appeared. The animal experiments were repeated by a Rockefeller Institute scientist with the same results. Studies on human patients now indicate that lack of the vitamin is not important in causing the disease.

## COMBINATION OF SUBSTANCES NEEDED FOR THE CURE OF ANEMIA

THE ability of liver to keep pernicious anemia patients alive and well, so long as they keep on eating or taking liver extract, does not depend on any single chemical substance contained in liver.

Experiments showing that the effectiveness of liver depends on a mixture of three active substances, two of

which have been obtained in pure crystalline form, were presented by Drs. Cyrus H. Fiske, Y. Subbarow and Bernard M. Jacobson, of the Harvard Medical School.

Since the discovery of the liver treatment for pernicious anemia, continuous efforts have been made to find the chemical substance in liver responsible for its effect on the disease. Although potent liver extracts are now available for pernicious anemia patients, if the active substance in liver could be identified, it might be made in the laboratory much as many other medicines are made, instead of having to be extracted, at considerable expense, from liver itself.

Three substances obtained from liver by chemical treatment and known as "fractions" have been found to have an effect on the blood-cell-forming organs of both patients and guinea-pigs. But in the course of chemical purification of the "fractions," they lost their anemia-relieving potency. Two of these "fractions" have been obtained in crystalline form and the chemical composition of one of them determined. Separately these "fractions" have no effect on pernicious anemia patients, but a mixture of all three of them is highly effective as a remedy for the disease.

### THE REPOPULATION OF FOUR FARMING REGIONS

WARNING that the subsistence homestead activities of the Federal Government should not be directed toward encouraging migration of people to poor farming areas was the keynote of a round-table discussion at the Conference on Population Studies in Relation to Social Planning under the auspices of the Population Association of America at Washington.

The notion that the movement to the country districts since the depression has done much to correct an "over-balance of population," and has placed people in more promising locations, is contrary to facts brought to light by a survey conducted by the Study of Population Redistribution, by Dr. Carter Goodrich, director of the survey.

Since the depression, the increases of population have been particularly heavy in those farming regions that were the very worst, as measured by *per capita* farm income during prosperous years. Population increases were heavy in the most poverty stricken and unpromising areas of the cut-over country of Michigan and Wisconsin, and in the mountains of West Virginia and eastern Kentucky.

Contrasted with this movement of people back to bad farms, was the movement during the prosperous years before 1929. Then the migrations were drawing people away from those areas that have had the heaviest relief loads during the depression.

Twenty-seven of the 29 "poorest" counties in the United States, having an average of over 36 per cent. of the population on relief, and 70 of the 80 worst, having over 30 per cent. on relief, were areas that people were leaving during the prosperous twenties.

### LENGTH OF LIFE AND OLD-AGE PENSIONS

THERE will be 25,500,000 people over 65 years of age in 1980. This is the estimate of those who would be

old enough to be entitled to old age pensions under proposed legislation, made by Drs. Louis I. Dublin and Alfred J. Lotka, of the Metropolitan Life Insurance Company, speaking before the Conference on Population and Social Planning.

If every person over 65 in 1980 were to receive \$15 per month as the federal share of an old-age pension, the total bill would amount to \$4,690,000,000. This is much higher than the estimate of the President's Committee on Economic Security, who figured that the maximum would be reached in 1980 at \$1,294,300,000. The committee's estimate was based on the assumption that there would be only about 17,000,000 persons over sixty-five years in 1980.

The use of a succession of life tables allowing for the lengthening of the life span and the increase of the proportion of older people in the population was urged by Drs. Dublin and Lotka in their report.

The birth-rate in the United States has declined to a point where it is too low to allow the present population to replace itself in the next generation. In the year 1920, the rate of natural increase was 5.4 per thousand. That is, 1,000 persons would be replaced by 1005.4. Since then the increase has dwindled past the zero point until in 1933 there was actually a decrease of 3 per thousand, or almost as much on the negative side as it was on the positive side ten years previously.

### ITEMS

COMPLETE removal of the thyroid gland in the neck cuts the work of the heart almost in half, which explains why the operation relieves symptoms of heart disease such as angina pectoris, Dr. Mark D. Altschule, of Boston, reported at the meeting of the American Society for Clinical Investigation. The operation reduces the metabolic rate to about minus thirty per cent., and at the same time there is a forty per cent. decrease in the work of the heart, Dr. Altschule found. The thyroid gland controls the metabolic rate, that is, the rate of energy interchange in the body, and when this rate is high, indicating that the interchange of energy is proceeding at a rapid pace, there is more work for the heart to do. Removing the thyroid completely reduces the metabolic rate to a low level and relieves the heart. The theory that this is why removal of the thyroid relieves symptoms of heart disease was put forward by Dr. Herrman L. Blumgart, of Boston, some years ago. Dr. Altschule's studies confirm the theory.

SERUM tests that identify "quite definitely" the virus causing human influenza and show the same virus is the cause of the disease in different parts of the world were reported by Drs. Thomas Francis, Jr., and T. P. Magill, of the Rockefeller Institute for Medical Research, at the meeting of the American Society for Clinical Investigation. The virus was obtained from throats of influenza patients in Puerto Rico, New York and Philadelphia. The virus can be transmitted to both ferrets and mice, and in both species of animals causes consolidation of the lungs. Most of the mice die of the disease, but the ferrets usually recover. The blood serum of ferrets that have recovered can check the ability of the virus to infect mice and to produce the lung consolidation. So does

the blood serum of convalescent influenza patients, but the serum taken from patients during their acute illness does not protect the mice against the disease. This latter finding, Drs. Francis and Magill state, seems to "show quite definitely that the virus is the causative agent of the human disease."

PROSPECT of obtaining "heavy" water which will allow large scale experiments with this rare and relatively new liquid was presented to the American Chemical Society. Dr. D. S. Cryder, of Pennsylvania State College, told how heavy hydrogen can be concentrated by distillation of ordinary steam. About a trillion pounds of steam are generated annually by the U. S. power and light industry and the 2,000,000 pounds of the now-expensive liquid would result if only one per cent. of this steam had its heavy water extracted. Dr. Cryder predicted that the new Penn State method would allow production of heavy water at less than \$2 a gram, ten cents a drop, the present lowest price quoted by Norway where cheap electricity is available. The present method of concentrating deuterium-rich water is by electrolysis. Water with its hydrogen of the double-weight variety—deuterium to chemists—is useful in tracing chemical reactions which may lead to new chemical knowledge of great value to industry.

CAVIAR may be a delicacy to most people, but to children of Soviet Russia it may become a tasty substitute for cod-liver oil because, like the fish oil, it is rich in anti-rickets vitamin D. A daily dose of two teaspoons of caviar was prescribed for one month to a group of 20

babies suffering from rickets. Seventeen of the babies were completely cured by this epicurean treatment, according to a report made by Professor M. Lepsky. Caviar from sturgeon and carp-like fish was used in this experiment. The caviar of various fishes differs but slightly in composition, however, so it is possible that other kinds of caviar may prove equally effective as a cod-liver oil substitute.

CONCLUSIVE fossil evidence that an arm of the sea covered central New Hampshire for a period of from fifty to a hundred million years longer than geologists have previously believed has been found by Professor Marland P. Billings, of Harvard University, and Dr. Arthur B. Cleaves, of Lafayette College, Pennsylvania. Several hundred specimens of fifteen species of fossils positively identified as belonging to the lower Devonian epoch have been found by the two scientists in the vicinity of Littleton, northwest of the White Mountains and about ninety miles inland from the Atlantic coast. It had not been previously known that the sea in this period extended into New Hampshire, although its extension into other areas at that time had been ascertained. Fossils of the Silurian period, believed to have begun about 400 million years ago and to have continued until the Devonian epoch, have previously been found in this area and told science that the sea was there at that time, but until the present discovery, no fossils satisfactorily identified as Devonian had been found in the region. Consequently the continuance of the sea in that area for fifty million additional years was unknown.

## MANUAL OF THE SOUTHEASTERN FLORA

ILLUSTRATED

Being Descriptions of the Seed-Plants growing naturally in North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Tennessee and Eastern Louisiana

By

JOHN KUNKEL SMALL

**T**HIS Manual replaces the author's *Flora of the Southeastern United States*, published in 1903 (second edition 1913), for the Southern States east of the Mississippi River. It embodies the results of continued exploration and study, thus bringing up to date our knowledge of this floral region.

The Manual is the only complete illustrated work on the flora of the Southeast by a recognized authority.

In addition to analytical keys to the various plant groups, and descriptions of the orders, families, genera, and species, regional or altitudinal and geographic distribution, there are xxii + 1554 pages and over 1500 illustrations, one illustration of a species of each genus.

Price \$10.50 Postpaid

**THE NEW YORK BOTANICAL GARDEN**

Fordham Branch P. O., New York City