SCIENCE NEWS

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FUNCTION OF THE THYMUS GLAND

THE enigma of the thymus gland has been solved, or at least partly solved, by Dr. Oscar Riddle, of the department of genetics of the Carnegie Institution of Washington. The thymus is one of the ductless glands situated in the neck, and has long been a puzzle to physiologists, for its function has never been discovered.

Dr. Riddle has learned, however, by observing pigeons with diseased thymus glands, that these control the formation of egg shells, and have further effects on the reproductive processes. Pigeons with thymus glands removed by operation also produced shell-less eggs. Feeding the abnormal birds with thymus made them normal again, and they produced good eggs. Although he has not yet succeeded in isolating this eggshell-producing substance from the thymus, Dr. Riddle gives it a provisional name—"thymovidin."

Though this solves the riddle of the thymus as regards birds, it does not show that the gland has any direct usefulness for mammals, for this higher class of animals does not lay shelled eggs. Dr. Riddle seems inclined to regard the structure in mammals simply as a surviving ancestral organ. He reasons: "Though not necessary to the life of the individual, thymovidin would seem essential to the perpetuation of those vertebrate species whose eggs are protected by egg-envelopes. Such animals were the ancestors of mammals, and thus mammals also probably could not have come into existence without the thymus."

THE PRODUCTION OF MALE CHARACTERISTICS IN FEMALE CHICKENS

TAKE the female sex glands from a hen and you take away her feminine nature. Hens that fight, crow and in other ways behave like roosters have been produced in the laboratory of Professor Frank R. Lillie, of the University of Chicago, by a simple gland-removing operation.

L. V. Domm, of the university, reporting on the work, says: "The larger percentage of our birds have assumed additional male characters following removal of the ovaries until they are practically complete replicas of the male, and, to those not familiar with their history, they are regarded as unmistakable males. Thus we find that they assume the complete male plumage, spurs grow as they do in the normal cock, head furnishings increase in size until they can not be distinguished from those of the normal male.

"Other birds in the pen regard them as males and when a strange cock is introduced they fight as would other cocks, very frequently assuming the initiative, some of them having been observed to come off victorious in such a combat. Many of these birds crow regularly. When aroused by a disturbance, it was found that their reaction is very similar to that of the male; the sounds they make, together with their reaction on such occasions, reminds one very much of the young male just prior to maturity.

"One set of experiments may be mentioned as an example: Out of one lot of fourteen females of the same hatch, one was kept as control and thirteen were operated upon between the ages of six weeks and six months; twelve of these have developed all the characteristics of the male mentioned above, some being completely cock-feathered, while the others are fast becoming so. The other one of the thirteen is very capon-like in appearance except perhaps for size and can not be readily distinguished from her capon brothers by those not knowing her history. This bird has assumed complete male plumage, is developing spurs; but the comb, wattles and earlobes are pale and small, resembling those of the capon.

"In some of our cases individuals which have assumed more or less complete male characters as concerns head furnishings, plumage and spurs, are reverting toward the female type as shown by the female type of plumage reappearing.

"Our results indicate that the female in the brown leghorn fowl has many potentialities of the male, which are normally inhibited by the presence of the ovary, and that these potentialities can assert themselves approximately fully after the complete removal of the ovary at an early age."

THE ETIOLOGY OF HEMACHROMATOSIS

COPPER, dissolved from the "worm" of the still during the making of liquor, is a cause of the disease popularly called "hardening of the liver," rather than the liquor itself, Dr. Frank Burr Mallory, of the Boston City Hospital, has announced to the medical profession. Copper in foods prepared in copper vessels or colored green with copper salts can produce the same malady. Chronic copper poisoning is a more common disease than has been thought, he says, for in 3.4 per cent. of a large group of post-mortem examinations he has found evidences of its harmful action.

Copper starts the poisoning of the system by causing the red coloring matter of the blood to decompose, forming a yellow pigment. This condition of the blood Dr. Mallory calls "hemachromatosis." The yellow pigment accumulates first in the liver, but when the liver becomes overloaded it gathers also in the pancreas, kidneys, lymph nodes, heart, thyroid and adrenal glands, and the skin of the hands and feet.

In the liver the cells where the pigment accumulates sicken and die. New cells grow, but the tissue thus formed is more like tumorous growth than healthy liver cells. Hardening of the liver follows. Accumulation of the poisonous pigment in the pancreas causes a breakdown of the tissue, followed by diabetes. When the adrenal cortex is attacked, abnormal darkening of the skin follows. So far as Dr. Mallory has observed, the

kidneys are able to repair successfully whatever mischief is done there. The liver, however, is always the first organ to suffer.

Copper poisoning is always slow in showing its effects. "Clinical cases show that ordinarily it takes fifteen to twenty-five or more years to produce the symptom complex," says Dr. Mallory. He places considerable stress on the importance of copper as an impurity in alcoholic drinks, and has investigated many samples of bootleg liquor seized by the Boston police. In nine out of eighty-four seizures of cheap "hooch" he found appreciable amounts of copper, and he has shown the metal to be present in home brew and fortified wines as well. In several of the cases he examined, the victims were habitually alcoholic. One of them, an ex-bartender who had turned bootlegger, had drunk a pint of whiskey and four or five glasses of beer every day for many years.

Copper poisoning as the result of inhaling or swallowing copper dust is also suggested. Three or four of the cases were men who had worked in machine shops where copper filings and dust were produced in quantity, and at least one of them was not a drinking man. Finally, Dr. Mallory suggests that poisoning may result from the eating of foods prepared or kept in copper vessels, or canned foods, like peas and pickles, colored green with copper salts.

"Now that the danger of poisoning has been pointed out," concluded Dr. Mallory, "steps should be taken to prevent copper from getting into liquors and foods, and to protect workers in occupations involving copper from inhaling or ingesting copper dust."

THE EFFECT OF COOKING ON VITAMINS

COOKING destroys vitamins, yet cooked foods may have adequate vitamin values. This paradox was stated before the annual convention of the National Canners' Association, at Washington, recently, by Professor Walter H. Eddy, of Columbia University, a widely-known specialist on the subject of vitamins.

Professor Eddy cited as an example the studies some years ago which indicated that ordinary cooking temperatures in an open kettle destroyed as much as ninety-five per cent. of the anti-scorbutic vitamin, or vitamin "C." It was assumed, following these experiments, that cooked vegetables were entirely useless as means of preventing scurvy and similar deficiency diseases. However, a test was later determined upon, and increased quantities of the cooked foods were fed to experimental guinea-pigs. It was discovered that even the small fraction of vitamin remaining in the cooked vegetables was sufficient to have the desired effect in the prevention of disease. This depends on the fact that vitamins are very powerful substances, and a little goes a long way.

Further experiments with foods cooked in sealed containers under pressure, with air excluded, showed that the vitamin content was impaired much less than it was in open kettle cooking. The delegates to the convention received this statement with interested comment, for canned vegetables are cooked under pressure. Professor Eddy stated that the cooking conducted in his laboratory was done in pressure cookers similar to those now used extensively in home canning.

Though he encouraged his audience in the matter of the effects of cooking methods in the canneries, Professor Eddy warned them against excessive blanching of their products, saying that, carried too far, such processes destroy valuable vegetable sugars and salts, and have a deleterious effect on the vitamins.

ITEMS

A METHOD for telling the age of perennial plants similar to the estimation of the age of trees by counting the annual rings on the stump, has been discovered by Dr. Hilary S. Jurica, of St. Procopius College. Plants with rhizomes, or underground rootstocks, Dr. Jurica explained, leave bud scars each season, like the bud-scars on twigs, and by examining these the age of the rhizome may be learned. The common May-apple, for example, after it reaches the age of seven years, remains always seven years old, for the "old end" of the rootstock decays as fast as the growing tip advances. By means of these steadily advancing rootstocks, perennial plants frequently come to dominate great patches of ground, and what may appear to be a whole colony of plants, comprising hundreds of stems, will prove upon digging up to be a single interconnected mat or web—a single plant twenty or thirty feet in diameter.

ALTITUDE tests for airplane engines may be carried on at sea level in the new altitude chamber at the U. S. Bureau of Standards. In this room it is possible to get the reduced air pressure and the extreme cold of very great heights. The altitude chamber is a small room in which the air pressure may be reduced as much as desired. The walls are of reinforced concrete about sixteen inches thick. Ammonia coils in the top serve to lower the temperature. The temperature of air entering the carburetor can be regulated separately from that in the room. In this way, without any risk of life, the causes for failures of engines may be studied. In the test chamber motors sometimes fail because of the moisture clogging the intake manifold with snow. It is believed that many planes have been wrecked because of this, but it could not be proved as the snow melted before an investigation could be made.

A SPECIAL sun-porch for his pedigreed chickens has been described by Dr. H. D. Goodale, of Williamstown, Mass. It has been built as a result of recent discoveries that sunlight is a substitute for the rickets-preventing vitamin, necessary for good health and normal growth in animals as well as human beings, and that it also has an effect on egg production. Dr. Goodale has divided his experiment into three sections, in each of which 96 hens are used. One lot is kept under ordinary chicken-farm conditions; a second is exposed to the light of mercury vapor lamps for an hour each day, to give them an extra dose of ultra-violet light; the third group is kept in a special pen with a sliding glass roof that can be pushed out of the way in fair weather and used to shelter the hens and their food when rain threatens. In this way the third group is given the advantage of every possible minute of sunlight.