SCIENCE NEWS

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THYMUS GLAND AND SEXUAL MATURITY IN RATS

ONCE the most mysterious part of the body, the thymus gland, which is closest to the heart of any of the endocrine organs, is now proved surprisingly to develop sexual precocity and speed up growth.

Dr. Leonard G. Rowntree, formerly of the Mayo Clinic, since 1932 director of the Philadelphia Institute for Medical Research, uncovered this hidden effect of the thymus. He followed a lead given by Dr. Adolph M. Hanson, of Faribault, Minnesota, who in time snatched from a busy practise made an extract of the thymus gland and reported that it seemed to lower blood pressure in the animals with which he worked. Dr. Rowntree was investigating this effect in rats when he discovered sexual and growth effects.

Injected daily with drops of powerful thymus extract, rats are affected markedly. Not so much the rats that first receive the injections, except that their families were more numerous. And their children's children, also treated with thymus extract, show little effect. But in the third generation, and in the fourth and fifth generations, sex came rushing earlier with more force, and size and growth were extraordinarily developed at early ages. The great grandratdaughters were rushed into parenthood by the physiological push of the thymus treatment. A third generation rat became a mother at 42 days and a fourth generation rat became a father at 29 days. They were correspondingly big and well-developed. Rats without benefit of thymus do not become parents until 50 to 70 days old.

An ounce-weight pinkish mass in the upper chest of children, the thymus has hitherto interested physicians principally because it sometimes chokes little babies to death. It dwindles to seeming insignificance when the boy or girl develops the sexual attributes of maturity. Numerous earlier investigations had failed to show a function of the thymus gland.

All animals from primitive fishes up to and including man have thymus glands. Calves' thymus glands are sweetbreads. It is from these that the Hanson extract is made. But you can eat this table delicacy without any worry that it will be forcing your grandchildren and great-grandchildren into early parenthood. Scientists long ago tried feeding thymus gland material to animals without any results.

Sexual precocity is perhaps the most striking effect of Dr. Hanson's thymus extract but general growth and development of the rats are also dramatically forced and they are unusually gentle and easy to manage. The third generation of the thymus-treated rats weighed a third again as much at birth as the average newborn rat. They could hear and they cut their teeth on their second day of life. By the fourth day their eyes were open and their bodies completely covered with hair. And they mate and bear offspring at a third of the age of their grandparents.

Dr. Hanson who prepared the potent thymus extract had previously given to the world a powerful extract of the parathyroids, tiny glands in the neck which govern bone formation. Because his extract was reported in a little-known medical journal, Dr. J. B. Collip, of McGill University, was credited with having first extracted the parathyroid gland hormone. But Dr. Hanson was able to prove his claim to priority and was awarded a patent for his product. Unselfishly sacrificing his chance for personal profit in the interest of the advancement of science, he assigned to the Smithsonian Institution in Washington all income and royalties accruing to him under the patent.

Three years ago Dr. Rowntree, then at the Mayo Clinic, gave the first dose of cortin to a human patient suffering from then-hopeless Addison's disease. His clinical use of the hormone extracted at Princeton University from the adrenal gland cortex was the first application of this important substance for the saving of human life.

VITAMINS AND HORMONES

DISCOVERIES of new vitamins and further effects of gland hormones were predicted by Dr. E. V. McCollum, of the Johns Hopkins University, and Dr. Oscar Riddle, of the Carnegie Institution of Washington, who on May 3 were presented with gold medals of the American Institute in recognition of their researches.

"There is little reason to doubt that at least one new fat-soluble vitamin remains to be discovered," Dr. McCollum said, "and probably at least two more water-soluble vitamins exist."

Dr. McCollum discovered vitamin A in 1913, and since has been a leader in nutrition research.

Dr. Riddle said that all the main elements of hormonal control of reproduction appear now to be known. He emphasized the fact that the women of the present generation are the first who could possibly know and learn the basis and the meaning of the cycles and adjustments which are peculiarly theirs. Not one of the four hormones chiefly involved in human or animal reproduction had been separated or assayed twelve years ago and the most recently separated is less than three years old.

Dr. Riddle, working at Cold Spring Harbor, New York, extracted the prolactin hormone from the anterior pituitary gland, demonstrated the thymovidin hormone of the mysterious thymus gland, and has done other important glandular researches.

Many new and spectacular researches in nutrition will come to light during the next ten or twenty years, Dr. McCollum believes. The recent discovery that paprika is a rich source of ascorbic acid or vitamin C suggests that research among plants of unusual or specialized structure may prove fruitful.

Sodium, calcium, magnesium, chlorine, iodine, phosphorus, sulfur, iron, copper and manganese are known to be indispensable in the diet. Yet with the exception of calcium, phosphorus and magnesium very little is known of the rôles played by these essential substances.

Important as are the applications of discoveries in nutrition to human health and wellbeing, as in the prevention of rickets, beri-beri, infantile scurvy and pellagra, Dr. McCollum foresees other advantages to be derived from them. Profits from the raising of farm animals may be increased enormously by applying present knowledge of proper feeding.

Failure to apply the facts already known about food needs and hormones is so great as to be humiliating, in Dr. Riddle's opinion. He blamed the schools for not giving a proper and sufficient introduction to scientific subjects, saying that biology was better taught thirty years ago than it is to-day.

THE VELOCITY OF STAR LIGHT

KNOWING the velocity of the earth in its orbit around the sun, the velocity of light coming to us from a star can be measured by observing the change in the Doppler effect when the earth in its orbital motion is approaching, and when six months later it is receding, from the star.

This Doppler effect is the shift of spectrum lines toward the blue when a source of light is approaching the observer, and a shift toward the red when the light is receding. The analogous effect in sound causes the whistle of a locomotive to sound shriller when the train is approaching than when it is receding.

Of course, it makes no difference whether the light is approaching the observer or the observer approaching the light. Ordinarily the Doppler principle is applied to determine the velocities of stars toward or away from the earth, assuming the velocity of light to be known. Conversely, the velocities of the approaching or receding bodies being known, the principle can be applied to measure the velocity of light.

The principle was so applied recently by Dr. P. Salet, and his results reported to the French Academy of Sciences. Using several stars, he found in every case a velocity slightly higher than Michelson's latest figure for light from a terrestrial source. On the average the excess was 0.8 per cent., but varied considerably with different stars.

The accuracy of this method can not compare, of course, with that of Michelson or of other terrestrial measurements. The probable error was on the average half that of the observed excess, in other words, 50 per cent. Hence it is problematical whether the excess really exists or not. Dr. Salet points out that Delambre, who redetermined the velocity of light by the eclipses of Jupiter's moons—the method by which Roemer originally discovered the finite velocity of light in 1675—obtained a velocity one per cent. greater than the terrestrial measurements.

The latest measurements of the velocity of light made last year at Pasadena by means of Michelson's mile-long vacuum tube showed curious periodic variations that seemed to be connected with the earth's rotation or motion.

In 1927 M. de Bray in an article in *Nature* pointed out that each succeeding measurement of the velocity of light, with one exception, had given up to 1926 a result less than the previous one, and drew the conclusion that this supposed absolute constant was actually diminishing with time. He now finds his conclusion confirmed, as he again reports in *Nature,* by the two measurements that have been made since that time. Thus, Michelson's measurement at Mount Wilson in 1926 gave 299,802 kilometers per second. A highly accurate measurement by Karolus and Mittelstaedt in 1928 gave 299,778 kilometers. The vacuum tube in 1933 gave 299,774 kilometers. M. de Bray consequently feels quite confident that his hypothesis has been confirmed and that the velocity of light has actually been diminishing since 1900 at the rate of about 4 kilometers per year.

The verdict of science on this is not yet rendered. But up to now, physicists have been inclined to attribute all such variations to unknown sources or to error. The fact remains, however, that they have never been explained, and sometimes important discoveries lurk in just such unexplained residuals.

ITEMS

A LARGE white spot on the planet Jupiter has been sighted by Professor J. J. Nassau, of the Warner and Swasey Observatory. It is an outstanding mark on the south equatorial belt and it is 20,000 by 2,000 miles in size. It makes an angle of thirty degrees with the planet's equator.

A LARGE reduction in the tuberculosis death-rate during 1934 is foreseen by statisticians of the Metropolitan Life Insurance Company who have been studying the mortality figures for the first quarter of the year. They expect the death-rate from this disease among the industrial population to run about 60 per 100,000 for this year. For the first quarter of the year the rate among insured white persons was 51.2 per 100,000, a "remarkably low figure."

RECENT calibration and test of instruments reveal that a true wind velocity of 164 miles per hour has been recorded on the top of Mount Washington during the present occupation of the peak as a meteorological observatory. Examination of records at the U. S. Weather Bureau show that this is an unusually high figure in the history of weather observation. A reading of 186 miles per hour was made on Mount Washington on January 11, 1878, with a hand anemometer which was held out of a window, C. F. Talman, of the weather bureau, states. Since anemometers of that day ordinarily read high, yet this one was not held in a well exposed location, its reading has been accepted as being approximately correct. Equally high and higher wind velocities are known to occur in tropical storms, but seldom does a record come through the destruction they cause. A 164 mile per hour reading was reported from Nassau during a 1929 hurricane. The present Mount Washington record was originally reported as 152 miles per hour, but the figure was altered by wind tunnel tests on the anemometer after it had been brought down from the mountain. The readings were taken between three and four A. M. last April 5.