BIOLOGY

Rats Youthful in Senility

Experimental giant rats have been produced with purified growth hormone. Scientists believe this shows that the body possesses no mechanism to block the hormone.

➤ A GROUP of animals, the like of which is strange to the earth, have been produced in the first series of experiments with the purified growth hormone at the University of California at Berkeley.

The rats never cease to grow during their lifetime, with the exception of a short period just at maturity. Senile in terms of age, they nevertheless died with giant bodies which possessed the characteristics of youth.

The animals' bodies were normally shaped, except for oddly small paws and bulging lower jaws, similar to the condition found in acromegaly. Their organs varied in size, some keeping pace with their body growth, others remaining normal, while still others were slightly reduced in size.

The odd giant rats were grown and analyzed by a team of scientists headed by Dr. Herbert M. Evans, director of the Institute of Experimental Biology, and Dr. Hermann Becks, professor of dental medicine.

From the time of the discovery of the growth hormone in 1921 by Dr. Evans and Dr. Joseph A. Long, a remarkable series of experiments have been conducted with this substance. Yet until the hormone became available in purified form recently, the impurities in the hormone used in earlier experiments made it impossible for scientists to be certain of precise effects of the hormone. In the recent experiments, the scientists can be certain of the hormone's effects.

In this research, the scientists used two groups of rats. One group was given no growth hormone. The other group, after reaching maturity and ceasing growth, at from 192 to 221 days of age, were given growth hormone until they were an average of 647 days old—extreme old age for a rat.

When the two groups of animals were sacrificed at this age, it was found that the injected animals weighed an average of 548 grams, an average gain of 293 grams, while the uninjected rats average 288 grams, representing an average gain of 59 grams. A gram is about one-thirtieth of an ounce.

During the early period of injection, the experimental animals grew at an enormous rate, and, while the rate of growth tapered off toward the end, these rats never ceased to grow.

One of the implications of this, the scientists state, is that there appears to be no antibody to the growth hormone; in other words, the body possesses no mechanism to block the continued effect of this substance.

Chemical analysis of tissues showed a high protein and water content with a decreased proportion of fat, a condition characteristic of youth. This was also a measure that true growth had taken place and not just a gain in fat.

Liver, stomach, intestine, kidney and heart increased markedly, maintaining the same proportionate size as the bodies. The reproductive organs decreased slightly in size, while the pituitaries and adrenals underwent just a slight increase in weight.

The animals had larger skulls, pelvis, vertebral column, tail, bones and chests. Small size of the paws was an indication that the growth centers had closed early in life.

Chemical studies showed that the giant rats excreted less nitrogen, which is a critical factor in animo acids, the building blocks of proteins. From this it was concluded that the mechanism of the growth hormone is to promote protein synthesis.

Colleagues of Drs. Evans and Becks in the research were Drs. Leslie L. Bennett, Alexei Koneff, Choh Hao Li, Miriam Simpson, C. Willett Asling and Daniel Collins.

Science News Letter, March 12, 1949

ARCHAEOLOGY

UNESCO Scientists Advise On Saving Indian Murals

➤ ANCIENT wall paintings discovered at Tanjore, South India, will be preserved if an emergency call for technical information issued by UNESCO is heeded and methods are discovered for separating two layers of frescos painted over 500 years apart.

Archaeologists in India are attempting to preserve and restore the superimposed layers of murals. Dr. B. B. Lal, archaeological chemist in Dehra Dun, appealed to the UNESCO field science cooperation office in New Delhi for suggestions from the world's archaeologists who had undertaken similar work.

The lower paintings were executed in the 10th to 11th centuries on a well-prepared base of lime plaster placed on a solid wall of granite blocks. Then in the 16th or 17th century another layer of lime plaster, also about a quarter to a half inch thick, was placed on top and similar paintings also in tempera of fresco-secco were placed on this layer.

The Indian archaeologists now want to remove the top layer of paintings and their base and mount them elsewhere, leaving the original decorations in place unharmed on the wall.

Science News Letter, March 12, 1949

RAINDROP BEHAVIOR—A single large water drop is seen here undergoing shock breakup in experiments simulating raindrop behavior conducted by weather scientists at General Electric Research Laboratory.

METEOROLOGY

Falling Raindrops Not Streamlined, Study Shows

➤ FALLING raindrops do not have the sleek, "teardrop" outline they are commonly supposed to possess, it has been demonstrated by Duncan C. Blanchard at the General Electric Company research laboratories. Instead, large drops pass rapidly through dozens of shapes—jelly beans, dumbbells, telephone sets, caterpillars, old shoes. Smaller drops are more conservative; they are usually either spherical or football-shaped.

Mr. Blanchard made his investigations with the aid of a machine that has been named the "drop controller", which simulates the conditions of a long fall by blowing a current of air upward against the drops, making a fall of a few inches equivalent to one of hundreds of feet in still air. During this nearly stationary fall the writhing drops changed shapes as often as 50 times a second, with every stage recorded by an ultra-high-speed stroboscopic flash camera.

One interesting raindrop phase might have been termed a miniature flying saucer, for the drops not only flattened into disks, but the disks spun dizzily as they fell.

Mr. Blanchard's investigation was carried on as a part of Project Cirrus, joint cloud study program of the Army Signal Corps and the Office of Naval Research. The work in the General Electric laboratories in Schenectady, N. Y., was done under the supervision of Dr. Irving Langmuir, associate director.

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