

MEDICINE

Muscular Dystrophy Clue

Studies on a strain of rats that suffer an inherited fatal muscle disorder may lead to an understanding of muscular dystrophy in man—By Faye Marley

► **CLUES TO UNDERSTANDING** muscular dystrophy and other muscle-wasting diseases are believed in sight as a result of a discovery of muscle disorder in animals with a genetic defect.

Dr. Salome Waelsch of Albert Einstein College of Medicine of Yeshiva University, New York, first spotted the genetic defect in a mutant strain of mice that die at birth because they lack the muscles needed for breathing.

The strange, fatal muscle disorder is caused by an abnormal, recessive gene, or hereditary factor, that is not sex-linked. It is transmitted in the same way as a number of human hereditary diseases, including phenylketonuria (PKU) which if not treated early can result in mental retardation.

The muscle disorder develops only in mice that inherit the abnormal gene from both parents. Tissue culture studies of abnormal muscle cells from the mutant mice are expected to help reveal how the genetic defect produces the abnormality. Failure of muscle cells to develop normally may be linked to production of some abnormal tissue protein.

Although the animals die at birth because they cannot draw a single breath outside

the womb, they appear to remain alive and seemingly well up to the time of birth, even though they are unable to wiggle a single muscle in response to electrical or other stimulation.

Their heart muscles beat normally before and right after birth, until death by suffocation, but the heart consists of muscle cells of a type different from that of the skeleton.

This indicates, Dr. Waelsch believes, that a different set of genes controls the differentiation of the heart muscle than the genes governing the development of voluntary muscle such as appear in arms and legs.

Working with Dr. Waelsch has been Mrs. Anna Pai, an Einstein graduate student who has described the widespread effects of the abnormal gene in her recently completed doctoral thesis. The researchers have named the hereditary disorder muscular dysgenesis, or mdg for short.

Mrs. Pai found that all of the mutant mice have a considerably shorter than normal jaw.

Both an abnormal jaw and similar skeletal defects have occasionally been reported in humans due to failure of skeletal muscle development.

About 77% of the animals have cleft palates, and they invariably have an abnormally developed chest along with various bone defects.

The study was supported by grants from the National Institutes of Health, Bethesda, Md., and from the American Cancer Society.

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ZOOLOGY

Dolphins Can Tell Hearts From Circles

► **DOLPHINS HAVE** demonstrated an ability to see the difference between similar geometric figures.

An eight-year-old bottle-nose dolphin, used to human beings, was tested by Winthrop N. Kellogg and Charles E. Rice, Stanford Research Institute, Menlo Park, Calif., working at Florida State University in Tallahassee.

When presented with pairs of dark figures on a light background the dolphin learned that touching the triangle meant food, the circle, nothing.

He quickly showed an ability to "reason" that an upside down triangle also meant food if paired with a circle and that the original triangle was positive even when paired with the inverted triangle.

In a test of 25 pairs of stimuli using circles, triangles, diamonds, stars, and hearts, the dolphin successfully discriminated 21, the scientists reported in *Science*, 143:1052, 1964.

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BIOCHEMISTRY

Artificial Insulin Gets Final Confirmation

► **THE FORMATION** of artificial sheep insulin has been confirmed by a University of Pittsburgh team of biochemists.

Insulin, which is used for diabetics, had never before been completely synthesized, although preliminary work has been done in splitting natural insulin into its two component parts and rejoining the chain.

This is the first time that man has completely synthesized chemically a protein. With a synthetic molecule, scientists will be able to make analogues, or variations, to see if they can produce a type of insulin with more desirable therapeutic effects.

Dr. Panayotis G. Katsoyannis, Greek-born naturalized citizen who headed the Pittsburgh team, said one of the important consequences of the synthesis could be help in the search for the basic cause of diabetes, still unknown.

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DENTISTRY

Mineral-Treated Cereal Prevents Tooth Decay

► **A MINERAL-TREATED** cereal that could help to prevent tooth decay—if it works—is being tried out on 1,000 Indiana school children.

Dr. Joseph C. Muhler, associate professor of biochemistry, Indiana University Medical Center, Indianapolis, told *SCIENCE SERVICE* that the name of the mineral cannot be revealed. The basic research was done under a General Foods grant, and Post cereal, a General Foods product, has been treated for use in the test, which is being supervised by local dentists.

"Children are free to eat the cereal with sugar and milk or in any way they ordinarily eat it," Dr. Muhler said. It may take two years to get the answer to questions on the effect of the mineral-treated cereal.

Dr. Muhler developed the stannous (tin) fluoride formula now used in Crest toothpaste, but he said the cereal additive definitely is not fluoride.

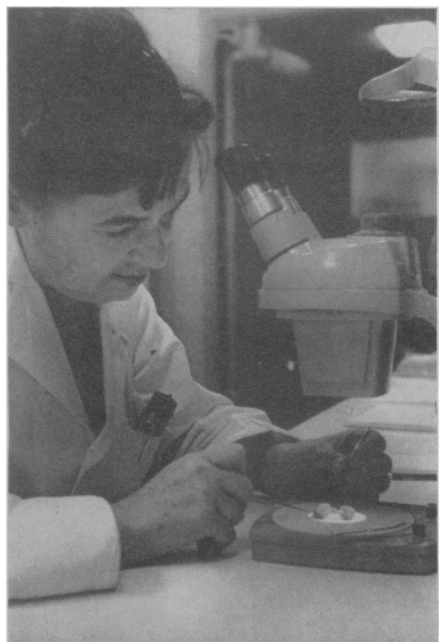
Preliminary results from a three-year study of children in North and South Dakota who were fed phosphated bread have been poor, Dr. Frank J. McClure, chief, laboratory of biochemistry, National Institute of Dental Research, Bethesda, Md., said, in spite of the fact that a type of calcium phosphate drastically reduced tooth decay in white rats.

"We do not yet have a final answer on the effect of phosphates," the biochemist explained.

The advantage of phosphates is that they do not add anything new to the body chemistry that could produce side effects, Dr. McClure pointed out.

Although water fluoridation has reduced tooth decay at least 50% in every community in which it has been installed, a large proportion of the U.S. population still drinks unfluoridated water. For this reason other approaches to inhibiting tooth decay are being tried.

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Albert Einstein College of Medicine

MUSCLE DISORDER STUDY—Dr. Salome Waelsch, department of genetics, Albert Einstein College of Medicine, examines tissue of abnormal embryos from a new strain of mutant mice she discovered.