

BIOLOGY

Baby's Sex May Depend On Mother's Immunity

► IN SOME FAMILIES with a first-born son, further boys may be impossible because of the mother's immunity to the male antigen, three biologists from the University of Helsinki, Finland, reported in *Nature*, 193:308, 1962.

It is well known that certain families have predominantly boys and others girls, but in other cases, first sons make it less likely for couples to have further boys. The scientists suggest that a small number of mothers are immunized against male antigens and that this immunization is harmful to subsequent male fetuses.

This leads to the question of why there are not more boys among the still-born and abortions. Although some studies have been made, the results are contradictory.

Drs. K. O. Renkonen, O. Makela and Raimo Lehtovaara reported the study. They referred to previous studies that showed the older the father, the more likely the baby is to be a girl. Older mothers also appear to have more girls, but this is said to be caused by the fact that the fathers also are older when the later children are born.

Present sex ratios in the United States show more boys than girls under five years of age. However, in the older age brackets there are more women than men because women tend to live longer.

The 1960 U.S. census showed 92,701,000 females and 90,510,000 males. Latest figures available for children under five show that males outnumber the females, 8,490,000 to 8,173,000.

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MEDICINE

Canine Hepatitis Virus Not Dangerous to Man

► INFECTIOUS HEPATITIS in dogs does not seem to be dangerous to man.

Although infectious canine hepatitis and human adenoviruses share many common characteristics, no conclusive evidence has been reported to indicate that the dog virus is capable of infecting man, Dr. J. E. Prier of the University of Pennsylvania School of Veterinary Medicine, Philadelphia, reported in *Public Health Reports*, 77:290, 1962.

The possible transmission of the canine disease to man, particularly when illness occurs at the same time or has similar manifestations in a pet and a family member, has prompted questions that Dr. Prier attempted to answer in a review of research on infectious canine hepatitis virus.

Not only has the dog virus been accused of causing infectious hepatitis in man, but the possibility that human hepatitis viruses are capable of causing infection in the dog has been suggested.

But this switch on "man bites dog" cannot be proved by research done so far, Dr. Prier said. Common to both viruses, however, is their ability to cause infections such as tonsillitis, keratoconjunctivitis (inflammation of both the cornea and conjunctiva),

pharyngitis and lymphadenopathy (disease of the lymph nodes) in their respective natural hosts (both dog and man).

"Since the characteristics of the two viruses are nearly parallel," Dr. Prier said, "it is not impossible that the canine adenovirus may cause a respiratory disease in man or that human adenoviruses may have an affinity for the respiratory-enteric tracts of the dog."

The main serologic similarities among the causative viruses of various diseases (canine distemper and measles, parainfluenza and bovine shipping fever, smallpox and cowpox, human adenovirus and infectious canine hepatitis), Dr. Prier said, point up the reservations one must assume when considering the specific identity of viruses.

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PHYSICS

Basic Theory Extended To Handle Light Waves

► A BASIC ADVANCE in the theory of light—showing how light can be treated as radio waves—are in every radio and TV set—was reported to the American Physical Society meeting in Washington, D. C.

Drs. N. Bloembergen and P. S. Pershan of Harvard University have extended the laws of reflection and refraction of light to make them apply to plastic or glass or other non-linear materials. They did so because of the recent development of light sources of tremendous power, known as lasers or optical masers.

Laser light is the most intense known. It is emitted at one frequency and in one direction. Light waves are basically the same as radio waves except that their frequency is a million times higher or their wavelength is a millionth the length.

Lasers perform the same job for light waves that radio transmitters do for radio waves. Techniques to modulate radio waves, multiply their frequency or mix the frequencies of two radio waves, for instance, are well known. These effects occur in so-called non-linear circuit elements.

With the development of optical masers, similar techniques can now be applied to light waves. The frequency of a red light wave, for instance, can be doubled to make a coherent blue or ultraviolet light wave. Infrared and red light can be mixed to obtain green light that has a frequency equal to the sum of the infrared and red frequencies.

In order to apply the non-linear techniques of treating radio waves to laser light, the classical laws of optics had to be extended. Drs. Bloembergen and Pershan have extended the laws of reflection and refraction of light to the case of non-linear materials.

The law of reflection dates back to Greek antiquity. Snell's law of refraction dates from 1621 A.D., and Fresnel's laws of intensity and polarization of reflected light waves from 1823. The corresponding laws for the reflection, refraction and intensity of the light harmonics have now been formulated.

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MEDICINE

Rapid New Breath Test Measures Fat Absorption

► THE INABILITY to digest or absorb fats can be diagnosed by a rapid new breath test that uses radioactive carbon.

The technique was developed by Drs. Arthur D. Schwabe, Leslie R. Bennett and Sherman M. Mellinkoff of the University of California, Los Angeles, School of Medicine to study the disorder known as steatorrhea.

Subjects were fed fats tagged with radioactive carbon and were placed in a space helmet. If the fats were normally digested, absorbed by the intestine, and chemically processed by the liver, a definite amount of radioactive carbon was recovered in the exhaled carbon dioxide. This expired radioactive carbon dioxide was continually piped into and measured by special, sensitive radiation counters connected to the space helmet.

It was found that in 50 minutes an average of 17.5% of the administered radioactive carbon was found in the breath of normal subjects as compared to 4.7% in that of steatorrhea patients.

Patients with diseases such as non-tropical sprue and ileocolitis, which are often associated with poor fat absorption, were studied with the technique before and after successful treatment. A marked increase in radioactive carbon dioxide was detected in the patient's breath after treatment.

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PSYCHIATRY

Drop in Childhood IQ Found for Psychotics

► CHILDREN who become mentally ill as adults have a significant decline in mental tests scores between early childhood and later childhood.

This is based on test scores obtained during routine testing in the public schools long before the children were suspected of being psychotic or even pre-psychotic, Drs. Ellen A. Lane and George W. Albee, psychologists of Western Reserve University, told the Eastern Psychological Association meeting in Atlantic City, N. J.

They checked the test scores on both group and individual tests for all schizophrenics at Cleveland State Hospital and Cleveland V.A. mental hygiene clinic who had once attended the Cleveland public schools.

A significant decline in measured intelligence was found between second grade and sixth grade. This is the first time such a study has been made; usually tests are given to the patient on entrance to the hospital, after onset of illness.

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CE FIELDS

PALEOBOTANY

Pollen Found in Rock Two Billion Years Old

► TINY PLANT pollen grains have been found in rocks up to two billion years old.

Specks of fossil spores and pollen were distinguished in rock layers laid down by waters from 500 million to two billion years ago, Dr. Sofija N. Naumova of the Geology Institute, Academy of Science, Moscow, reported at the International Conference on Palynology.

Experts on pollen and spores from many countries meeting at the University of Arizona, Tucson, heard Dr. Naumova relate his systematic study of 32 "index" complexes of microscopic vegetable remains from sedimentary rocks in Russia (The Urals, Siberia), Poland, Czechoslovakia, Scotland, and many other countries in Europe and Asia.

More than 650 species of spores and pollen belonging to 56 new morphological genera were described by the Russian scientist. These included shreds of tissue and fragments of many algae, tiny one-celled organisms.

Remnants of primitive pine trees and seed-bearing plants were found during the study, Dr. Naumova reported. Microscopic algae and their sporocysts were also found highly developed in rocks 500 million years old or less.

The 32 complexes can be clearly traced within eastern Europe and Siberia and, he added, can be successfully used for the correlation of the oldest sedimentary rock masses of the earth.

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MEDICINE

Coronary Heart Disease Can Be Misdiagnosed

► SOMETIMES INDIGESTION and other troubles lead to a wrong diagnosis of coronary heart disease, Dr. Paul Dudley White of Boston told the seventh Hahnemann symposium on coronary heart disease in Philadelphia.

The famous heart specialist, professor emeritus of Harvard, who was called into consultation when former President Eisenhower suffered a heart attack in 1955, said usually the diagnosis is easy, but in a minority of cases it is difficult or impossible.

"Errors are usually due to inadequate time or care in eliciting the patient's own story," Dr. White said, adding that inexperience in electrocardiogram interpretation is also a possibility.

Another reason for misdiagnosis may be due to the fact that the patient is in a state of shock following an operation or from some other cause. Anesthesia during surgery is another contributing factor in wrong

diagnosis, or there may be confusion caused by coincidental symptoms.

Dr. White said a few of his patients, even doctors, have concealed heart pain from their families, their friends and even their physicians, until forced by circumstances such as an attack of coronary thrombosis to admit that they had angina pectoris.

Irritability of the esophagus and gastric stoma (opening), called cardiospasm, is the commonest condition in Dr. White's experience with which coronary heart disease may be confused. This may or may not be associated with a hiatus or diaphragmatic hernia, a common condition that bothers some people much of their adult life.

"The cardiospastic pain," he explained, "tends often to be briefer and recurrent, comes at rest and is often dispelled by walking." He said this is frequently accompanied by the belching of "gas."

Other conditions confused with heart attacks included the pain of acute gall-bladder disease, shingles (herpes zoster) and extremely rapid heart action (paroxysmal tachycardia).

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ANIMAL PSYCHOLOGY

Early Experience Affects Chicks' Sexual Behavior

► BABY CHICKS that learn to follow a moving plastic object as a substitute "mother" may also later select that object for their sexual advances.

Newly hatched chickens were exposed to one of two moving objects during the first nine or first 17 days after hatching. From the fifth day of life, they were also given daily injections of the male hormone, testosterone.

After 19 days, the sexual behavior of these two groups of chicks was compared with that of a group not exposed to the moving models until the tenth day of life. Birds exposed to the plastic mothers soon after hatching and during the hormone injections showed a much higher rate of sexual activity than those exposed later in life, and almost without exception chose the plastic object they had learned to follow as the object of their sexual advances.

R. Bambridge of Queen's University department of psychology, Kingston, Ontario, found no observable difference in behavior between the two types of barred rock chicks used for the experiments.

He also tested the number of times during the day that each chick was found following close to the moving object. Those exposed early were very often within four inches of the moving plastic mothers, whereas those exposed later in life were usually at the opposite end of the test box from the moving model.

Exposing birds to a biologically inappropriate object during very early life so that they learned to treat the object as a substitute mother is known as imprinting. Imprinting during the critical early period is of particular significance in determining the choice of sexual object, Mr. Bambridge reported in Science, 136:359, 1962.

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PSYCHOLOGY

Scientist Finds Learning Process Can Be Reversed

► FOR MANY YEARS scientists have been teaching rats and other animals by rewarding them with a pellet of food or a few licks of water when they had learned to do the required task of running in the right direction or pushing on a bar.

Now a psychologist at the University of Missouri has found that the process can be reversed. The animals can be trained to eat or drink by rewarding them with the opportunity to run.

Whether the drinking or the running is the reward that produces learning is determined by the conditions of the experiment and can be changed at will from one to the other, Dr. David Premack reported in Science, 136:255, 1962.

Dr. Premack tested rats on an activity wheel which could be rigged up in several different ways. One way, it was arranged so that each five licks on the drinkometer released the wheel so that the rat could run. This made running the reward when the rat had put in his five licks of drinking.

When the wheel was freed so that the rat could turn it freely by running until the drinkometer came up and the rat could get water, then the water became the reward that induced the animal to run.

When the rats were given free access to the activity wheel at all times of the day, but were allowed to get at the water only one hour a day, drinking became relatively much more attractive. Six of the rats spent about four minutes of their precious hour drinking. At the same time they cut down their running to slightly less than a minute for the entire day.

Dr. Premack concludes that it is the relative probability (or improbability) that determines whether running or drinking will be the reward. It has been previously thought that the drive or need of the animal determines which is the reward.

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PSYCHOLOGY

Just as Quick to Look For More Than One Thing

► THE SECRETARY who must simultaneously look in the file for several letters, or must hunt down several figures in a financial report need not spend more time than hunting for just a single item. This may be concluded from a report presented to the Eastern Psychological Association in Atlantic City, N. J.

Dr. Ulric Neisser of Brandeis University told the meeting about an experiment in which he required the subject to scan through lists of nonsense words, looking for one or more particular letters. It takes no longer, Dr. Neisser reported, to search for either of two letters, or any of four, than for one letter alone.

Apparently, an individual is capable of executing several different mental processes simultaneously, Dr. Neisser concluded.

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