BIOLOGY

# X-Rays Cause Sterility

➤ MOTHERS GIVEN X-ray treatment while carrying unborn girl babies may have daughters who cannot themselves bear children.

The National Academy of Sciences was told by a team of Oak Ridge National Laboratory experts on atomic radiation this is indicated by experiments on mice.

If human beings react like mice, this has implications for the human race living in an atomic world.

In mice the effects of radiation vary tremendously according to the age of development of the mother mouse at the time she is exposed to the X-rays.

The Oak Ridge experimenters were Drs. W. L. Russell, Liane Brauch Russell, M. H. Steele and E. L. Phipps.

The fertility of females that had received 300 roentgens of X-rays on the day of birth was not greatly affected, even when the amount was delivered in a single burst at the acute dose rate of 89-90 roentgens per minute. These females commonly produced nine or ten litters when they reached maturity. Yet, adult female mice given the same acute dose never produced more than two litters. Even a dose of 50 roentgens of acute irradiation was considerably more damaging to the fertility of adults than 300 roentgens given to new-born females.

Thus the ovary of the new-born showed high resistance to X-rays. However, the ovary proved to be extremely sensitive to low amounts of radiation during the second week after birth. Mice exposed to X-rays at this infant stage in their development became sterile after producing either a single litter or a second, smaller one.

Adult females that had been given the same low total dose at the same low dose rate as their two-week-old counterparts showed no significant difference from mice that did not receive radiation. The mice produced an average of 13.3 litters.

Thus it is apparent that the second week of life is a radiation-sensitive period for the female. This period also coincides with the time when the immature reproductive cells have just reached the stage in which they will remain throughout most of their adult life.

The human ovary is suspected of being extremely sensitive at a comparable stage of development. This stage in the human is apparently attained, not during the second week after birth, but at some time before birth. This raises the unfortunate possibility that even quite a low dose of radiation can cause sterility in a human fetus, the investigators said.

In addition, this dose may be much lower than would have been guessed from the effects of radiation on the adult ovary, they concluded.

Science News Letter, May 16, 1959

BIOLOGY

# Climate Affects Health

➤ CLIMATE can be blamed for ills, even beyond the cold drafts that sometimes accompany colds and other respiratory ills.

Dr. Rene J. Dubos, member of the Rockefeller Institute, New York, told the National Academy of Sciences that more and more examples are being reported of the complex and varied effects of climate on all forms of life, from the virus to man. It is becoming increasingly important for the biologist to be aware of the influences that physical environment has on biological processes, it was reported to an Academy symposium.

Some of the most commonly accepted relationships between weather and man's health—the increase in colds in the winter months and in polio in the summer—are still unexplained. Dr. Dubos also pointed out that there are "seasonal ebbs and flows" in diabetes and circulatory diseases.

Studies of man and other animals show that seasonal changes in hormone activity can be at the root of changes in physiological behavior like sugar metabolism and adrenal gland secretion. The effects of altitude on humans is a well-known example of another adjustment to climate. It has even been shown, Dr. Dubos added, that warm weather fronts are associated with a decrease, and cold fronts with an increase, in capillary resistance in man.

Climatic factors, which include ultraviolet and other irradiation in addition to air and water temperatures, humidity, precipitation and winds, can also operate through genetic mechanisms, Dr. Dubos said. Thus animals living in colder climates are usually larger than related species living in warmer climates.

Recently, Dr. Dubos reported, small ionized air molecules have been recognized as influencing biological behavior. Some researchers claim that positive space charges have harmful effects while negative space charges have beneficial effects. Even human patients have apparently benefited from treatment with negative ions, he said.

Control of man's environment, at least indoors, has already been achieved with air conditioning. Yet, Dr. Dubos warned, the new-found comfort now may be followed by new respiratory and circulatory disorders in the future.

Science News Letter, May 16, 1959

TEXTILES

## New Device Saves Cotton, Cuts Carding Costs

➤ A "BACKWARD STEP" in textile history is expected to save the textile industry millions of dollars each year in the future.

Cotton may be able to compete better with synthetic fibers as a result, the U. S. Department of Agriculture has speculated.

Just as cotton carding machines 75 years ago used stationary flats to help them disentangle and arrange cotton fibers, so a new, modern machine will use stationary flats. This will do away with an elaborate assembly of moving flats used on present-day carding machines. However, the new machine also includes many advances in design and engineering.

But a stationary flat is the main innovation. It is a semi-cylindrical housing, granular on the inside, and designed to use air currents to help separate tufts of cotton into individual fibers, reported USDA researchers R. A. Rusca, R. S. Brown and A. L. Miller of the southern utilization division, New Orleans. The new granular card weighs about 200 pounds compared with almost 1,000 for the moving flats it replaces. Upkeep is low and a major source of dust in textile mills should be eliminated since the carding machine is completely sealed when in use.

In pilot tests with various types of cotton from three growing areas, the machine cut cotton waste by more than half. Limited mill-scale tests also showed that fewer knots were left in the fiber.

Science News Letter, May 16, 1959

AERONAUTICS

## Supersonic Capsule Designed for Jet Pilots

See Front Cover

➤ A ROCKET-PROPELLED capsule which can shoot a pilot to safety from a doomed airplane within two seconds has been designed by engineers at Republic Aviation Corporation.

During normal flight the capsule, shown in the photograph on the cover of this week's SCIENCE NEWS LETTER, functions as a seat. In an emergency, it automatically closes in around the pilot to form a protective cocoon and is then shot out of the plane along a short set of rails.

Although the system was designed for safe escape at speeds up to four times that of sound and at altitudes as high as 100,000 feet, it was also designed for safe ejection at extremely low altitudes and low speeds. A ballistic parachute, which is instantly and forcibly opened, is used in this case.

Science News Letter, May 16, 1959

PHYSICS

## New Ceramic Magnets More Powerful Than Iron

➤ CERAMIC MAGNETS have been developed that, weight for weight, have two to three times the power of iron magnets and retain their strength at high temperatures. Produced by the Boeing Airplane Company in Seattle, the magnets are made by mixing two powdered metallic oxides, such as iron oxide and barium oxide. Boeing scientists have successfully induced the magnetic field while the ceramic is being formed under heat and pressure. This method appears to give the magnets longer life and stronger magnetic properties.

Science News Letter, May 16, 1959