

## RADIOLOGY

**New Discoveries on Radiation of Mice**

► LIFE is shortened more by one intense burst of atomic gamma radiation than by repeated doses that total the same exposure.

Discovered to be true for mice, if not for men, the results of gamma and neutron radiation tests were reported by Dr. H. J. Curtis of Brookhaven National Laboratory in Upton, N. Y.

One intense dose of radiation from gamma rays may be as much as four times as effective in shortening a mouse's life-span as the same dose given over a period of time.

Studies on radiation of mice show that acute gamma radiation may damage their chromosomes beyond repair, while small doses of the rays permit the chromosomes to heal themselves.

When mice are exposed to radiation from neutrons, however, there is no chromosome healing, Dr. Curtis reported to a symposium on Biological Effects of Neutron Irradiations.

Dosages of neutrons given all at one time and those given over a period of time are both equally effective in producing disorder or damage to the mice chromosomes. Chromosomes are threadlike bodies in the cell nucleus responsible for carrying on the characteristics of mouse or man.

Dr. Curtis reported that his experiments included exposing mice to single doses of 192 rads of neutrons and to series of doses of 31 rads per week. Rad is a scientific term meaning the unit of energy absorbed by the animal.

The meeting was the first to be sponsored in this country by the International Atomic Energy Agency, and representatives of 18 member countries attended.

• Science News Letter, 84:264 Oct. 26, 1963

## PHYSIOLOGY

**Brain Reserve May Be Greater Than Realized**

► WITH ONLY a fraction of the brain tissue that nature provides, animals can perform normally—suggesting more reserve capacity than has been realized.

Animals with a large portion of their brain removed soon after birth develop into adults not significantly different in intelligence and performance capability from their normal, unoperated litter mates, Drs. Bernice M. Wenzel and R. D. Tschirgi, University of California, Los Angeles, Medical School physiologists, have found.

The higher, integrating portion of the brain, known as the cortex, consists of two symmetrical hemispheres. In the UCLA study one complete hemisphere was removed at birth from several animals.

The animals were followed as they grew into adulthood. Their ability to perform and to make proper discriminations in mazes and other experimental situations was compared with that of their normal brothers and sisters.

No significant differences were noted in the animals' ability to discriminate left from

right or in their general behavior and intelligence.

The plasticity of the undeveloped infant brain makes it possible, in the case of the animals studied, to create a functional entity out of the raw material remaining even after a large portion of the brain has been removed, Dr. Wenzel said.

As the normal brain develops from birth, nervous pathways are established, interconnecting the two brain hemispheres. Had the operation been performed when the animals were somewhat older, the results would have been quite different.

When human adults suffer significant injury to one hemisphere of the brain, paralysis of arms or legs and loss of speech may occur. However, even in these cases, function may sometimes be regained because of the large reserve of brain tissue.

• Science News Letter, 84:264 Oct. 26, 1963

## MEDICINE

**New Birth Control Pill Near Final Approval**

► A NEW BIRTH CONTROL pill has been hailed as a medical achievement of worldwide significance by Dr. Alan Guttmacher, world-famous obstetrician and president of the Planned Parenthood Federation.

Ortho Research Foundation developed Ortho-Novum 2MG, which contains only one-fifth as much progesterin as its older companion tablet, called simply Ortho-Novum and cleared last February by the U.S. Food and Drug Administration.

Dr. G. Arnold Cronk, director of clinical investigation of Ortho, said the new tablet has been administered to more than 5,000 women through more than 40,000 cycles without a single pregnancy. Side effects were fewer and milder than with any similar drug, he said.

All required tests of the new drug itself and the dosage form have been completed satisfactorily, Dr. Cronk said, and Ortho-Novum 2MG will become available for general medical use at modest prices as soon as the drug has fulfilled labeling requirements and final approval has been received.

Leading researchers all over the country have submitted clinical records to support Dr. Cronk's summary of medical tests.

• Science News Letter, 84:264 Oct. 26, 1963

## SPACE

**Space TV Camera Made Flashlight Size**

► THE WORLD'S smallest TV camera, the length of a two-cell flashlight and weighing 27 ounces, has been built for exploration on the moon and for spying on orbiting astronauts.

Called "molecularized" by its builder, Westinghouse Electric Corporation's air arm division in Baltimore, Md., the new space instrument has electronic blocks for performing functions of amplification, synchronization and scanning that usually need bulky tubes and devices in ordinary TV.

The engineers expect to reduce its size by half before they put it into production.

• Science News Letter, 84:264 Oct. 26, 1963

**IN SCIEN**

## ORNITHOLOGY

**Mating Among Birds Depends on Day's Length**

► THE NUMBER of daylight hours sets off an inner mechanism within birds that leads to the whole marvelous process of reproduction.

When daylight hours are longer, parent birds respond with nest-building and all the other gestures necessary for production of offspring and survival of the species.

The changing duration of daylight is the most reliable source of information from the environment to the bird to indicate the best period for reproduction, Dr. Donald S. Farner of Washington State University reported in Minneapolis.

This is particularly true for many migratory species of birds whose breeding and wintering areas lie in the temperate, subarctic and arctic zones, he told members of Sigma Xi at the University of Minnesota.

Dr. Farner reported on his investigations with the white-crowned sparrow, a bird whose annual behavioral cycles are almost completely controlled by periods of light.

These studies included observations on the duration of the daily light, intensity, wavelength and effects of light flashes. Light fluctuation is an overwhelmingly important factor for birds in the control of reproductive and other annual cycles.

• Science News Letter, 84:264 Oct. 26, 1963

## PHYSICS

**Spectrometer Analyzes Invisible Light Bands**

► A NEW DEVICE for analyzing tiny light bands only millionths of an inch wide has been developed by three University of Wisconsin physicists and a French colleague.

Known as the "Pepsios" spectrometer, it intensifies light beams by increasing the light-gathering power of an ordinary spectrometer 100 times. This is accomplished by using near-perfect smooth, flat plates to break up the light rays, instead of a prism or grating.

When light passes through a prism, the resulting array of colors is known as the spectrum. Physicists regard a spectrum as a series of radiant energy arranged by wavelengths. A spectrometer studies minute, invisible bands found in the individual wavelengths.

The Pepsios spectrometer will be used to study atomic properties and spectra and the composition of the upper atmosphere.

Developed by Prof. Julian Mack, Drs. Douglas McNutt and Frederick Roesler of Madison, and Prof. Robert Chabbal of the University of Paris, the Pepsios spectrometer can analyze light down to a few millionths of a millionth of a centimeter, they reported in Applied Optics, Sept. 1963.

• Science News Letter, 84:264 Oct. 26, 1963

# CE FIELDS

## NUTRITION

### Ammonia for Speedy Preservation of Fish

► LIQUID or gaseous ammonia may solve an ancient problem of keeping fish from spoiling in the tropics.

A quick and easy treatment of immersing sardines in ammonia has preserved fish for more than two months without deterioration of their nutritive value. Using the ammonia treatment soon after fish are caught allows bulk storage at ordinary temperatures.

There is no measurable residue of ammonia in the final product, report V. Subrahmanyam, N. L. Lahiry, M. N. Moorjani, R. Balakrishman Nair and M. A. Krishnaswamy from the Central Food Technological Research Institute in Mysore, India.

In many parts of the world, large catches of good edible fish become available during short seasons, the scientists reported in *Science*, 142:233, 1963.

When facilities for cold storage are inadequate, spoilage is extensive and valuable food is wasted. In the tropics, fish spoilage starts within a few hours after the catch.

The safe, speedy method of immersing the fish, in particular sardines, in ammonia solution for about one to two hours and then transferring to an air-tight vessel preserved fish for months in excellent condition, the scientists found. Temperatures were kept at about 77 to 86 degrees Fahrenheit.

Ammonia is a colorless gaseous compound of nitrogen and hydrogen with an extremely pungent smell and taste. As the fish is dried and processed into fish flour, the ammonia is removed and the preserved fish is free from pathogens and has a low bacterial count.

• *Science News Letter*, 84:265 Oct. 26, 1963

## DENTISTRY

### Nursing Nipples Should Resemble Natural Breast

► NURSING BOTTLE nipples should resemble a natural breast. Artificial nipples are now too long.

If a child has to have his teeth straightened, the ordinary kind of nursing nipple could be to blame, the American Dental Association was told at Atlantic City by Dr. Leon Brodis, Bradford, Pa., dentist.

The general nursing nipple is not only too long but allows the milk to flow too freely, Dr. Brodis said. He explained that this causes a child to thrust his tongue forward, causing a "deviate swallow" that later on could lead to trouble with his "bite," the way the teeth come together for chewing.

The child who swallows abnormally will push his tongue between his teeth, preventing their closure, and will suck in the lower lip to close his mouth. In the normal swal-

low, the teeth are together, the tongue is up in the roof of the mouth and the lips are sealed.

Before braces are necessary to straighten teeth a functional exerciser may be used to improve the chewing muscles. This treats "tongue thrust" in children two to five years old. In older children, both fixed and removable appliances are utilized to retrain the tongue to a correct swallowing pattern.

"In the case of the thumb-sucker," Dr. Brodis said, "the sucking habit should be broken first before the child can be expected to concentrate on the deviate swallow."

When thumb-sucking stops, the tongue thrust may also stop, as it is possible that the tongue is entering the space created by the thumb.

In persistent cases not only teeth alignment but speech therapy may be necessary.

• *Science News Letter*, 84:265 Oct. 26, 1963

## TECHNOLOGY

### High-Field Magnet Cooled by Hydrogen

► A LOW-TEMPERATURE, aluminum-wound, air-core magnet that produces a magnetic field several hundred times as large as a toy horseshoe magnet has been developed by the National Bureau of Standards.

High-field magnets are required in nuclear magnetic resonance studies and in the solid state maser. The high-field magnets in use today are large and require tremendous amounts of power to operate, whereas this magnet uses only nine kilowatts. The coil is wound with aluminum foil and cooled by liquid hydrogen.

• *Science News Letter*, 84:265 Oct. 26, 1963

## BIOCHEMISTRY

### Test Effect of Alcohol On Rats' Nervous System

► TO TEST the relationship of alcoholism to the nervous system, a technique of putting pure grain alcohol directly into the skulls of rats was tried.

The rats almost immediately became addicted, although they had not tasted the drink before and normally would not like it.

As a result, a new biochemical theory of alcoholism may have to be worked out, Dr. Robert D. Myers of Colgate University, Hamilton, N. Y., reported in *Science*, 142: 142, 1963.

Although the role of the central nervous system in human alcoholism as a disease is poorly understood, Dr. Myers said, there is much evidence that the "state of the nervous system is significantly related to one's selection of alcohol."

It is possible, he explained, that a tissue or cellular change of a biochemical nature occurs with continued alcohol drinking, which could sustain the chronic alcoholic's intake once the alteration has taken place.

Dr. Myers said the role of acetaldehyde, the colorless fluid produced by the oxidation of alcohol, and "other metabolic mediaries" in chronic alcoholism is now not clear.

• *Science News Letter*, 84:265 Oct. 26, 1963

## MEDICINE

### Drug for Leukemia Causes Fetal Deformity

► A CANCER DRUG called chlorambucil, a nitrogen mustard derivative used for a type of leukemia and Hodgkin's disease, was found to cause absence of the left kidney and ureter in a fetus, examined after the mother's medical abortion, a report in the *Journal of the American Medical Association*, 186:74, 1963, said.

The mother was given the drug during her pregnancy to combat Hodgkin's disease, which affects the lymph nodes and glands, but became so ill that her pregnancy had to be ended.

The embryo was normal on the outside, and the researchers pointed out the need for autopsy in such cases.

Since the thalidomide scare, drugs given during pregnancy are coming in for closer scrutiny than ever before. Pregnant animals had previously shown a high incidence of kidney and ureter absence after being given chlorambucil experimentally.

Drs. Donald Shotton of Lynchburg General Hospital, Lynchburg, Va., and Ian W. Monie of the University of California Medical Center, San Francisco, reported the findings.

• *Science News Letter*, 84:265 Oct. 26, 1963

## NUTRITION

### High Level of Sodium Necessary in Pregnancy

► TOO LITTLE SALT during pregnancy may increase blood pressure, a Pennsylvania State University nutritionist told the American Dietetic Association in Philadelphia.

Pregnant and nonpregnant rats were given low and high levels of sodium for a three-week period. A decrease in sodium in the diet stimulated an increase in renin, an enzyme produced by the kidney that can cause high blood pressure.

Dr. Ruth L. Pike, professor of foods and nutrition at Penn State, began her research with animals after a controversy arose five years ago over the proper intake of sodium during pregnancy. Uncontrolled clinical studies showed that adding sodium to the diet was not a good idea.

Dr. Pike found that the nonpregnant animals were able to regulate the excretion or retention of sodium, keeping a normal level at all times, regardless of how much was added or deducted from their diet.

However, pregnant rats retained greater amounts of sodium and potassium than nonpregnant animals. Those with a low sodium intake showed signs of deficiency and their young were smaller and less mature, whereas those rats having a high intake were able to compensate without any stress.

There is an increased need for sodium during pregnancy, since aldosterone, a secretion of the adrenal gland, will act on the kidney, causing it to retain enough sodium.

If there is a low level of sodium, more aldosterone is secreted. An increase in renin will result, since renin is necessary to stimulate the secretion of aldosterone.

• *Science News Letter*, 84:265 Oct. 26, 1963