

## MEDICINE

**More Than Two Million Cancer Patients Alive**

► THE LARGEST NUMBER of people "cured" of cancer in any one year has been reported by the American Cancer Society. Five-year survivals, which are considered cures, number 1.4 million, but actually there are more than two million alive who have been cured.

"Some 700,000 patients with cancers diagnosed within the last five years will live to enter the ranks of those cured," the Society's booklet called 1966 Cancer Facts and Figures states.

Lung cancer continues to be the leading cause of death in men, and the society estimates that three-fourths of these deaths—about 50,000 predicted for 1966—could have been prevented if the men had not smoked cigarettes.

Breast cancer continues to be the leading cause of death in women, with an estimated 63,000 new cases in 1966 and a probable 27,000 deaths.

A bright side to the problem of womb cancer is that the death rate shows a steady decline—it has dropped 50% in 25 years. This was once the leading cause of death from cancer in women. Tragically, 14,000 women will die unnecessarily because they do not have an annual checkup with a PAP smear.

Cancer of the stomach has shown a marked decrease in death rates both in men and women, although the reason is unknown.

Cancer of the colon will strike about 73,000 Americans in 1966, more than any other type of cancer except cancer of the skin, which is 92% curable if the malignancy has not spread beneath the skin. Cancer of the colon and rectum will take the lives of an estimated 43,000 persons in the U.S. in 1966. Wider use of the proctoscopic examination would save many of these lives.

Early diagnosis and treatment is still emphasized by the American Cancer Society.

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## PHYSIOLOGY

**Oxygen Deficiency May Damage Offspring**

► RESEARCH at 12,500 feet is attempting to answer important questions of how oxygen deficiency in pregnancy may lead to brain and heart damage in offspring.

Abnormal development of some of the main arteries of the brain has appeared in offspring of laboratory mice and rats subjected to reduced oxygen supply during pregnancy.

This was seen in animals whose mothers had been exposed to oxygen deficiency in a pneumatic chamber during pregnancy or to the rarefied air of the mountaintop laboratory.

The problem is being studied at the University of California's Barcroft High Altitude Research Laboratory on White Mountain near Bishop, Calif.

Using controlled oxygen deficiency during pregnancy as a precise research tool, anatomist Dr. Bernard Baird plans to study further the circulatory supply to the fetal brain. Thus he hopes to determine whether relationships exist between observable brain changes and such clinical conditions as mental retardation, cerebral palsy and epilepsy.

Even in normal animals at sea level, the major brain arteries appear to be subject to a great deal of variation, in contrast to the relatively standardized arrangement of the arteries leaving the heart.

Standards were set up to define a normal range of patterns. Departures from these were then divided into significant malformations and less serious structural variations.

Young animals from oxygen-deficient mothers showed a much wider range of variation than animals with mothers that had adequate oxygen supply during pregnancy, and they included the only outright malformations.

Variations occurred chiefly in vessels to the front of the brain. Less frequently variations occurred in vessels to the spinal cord and base of the brain.

In the current series of experiments Dr. Baird has found that a high proportion of the animals with significantly affected brain vessels also had defects of the inner walls, or septa, of the heart or of an artery leading from the heart or both.

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## PHYSICS

**High Flux Beam Research Reactor in Operation**

► A UNIQUE nuclear reactor for research is now in operation at the Atomic Energy Commission's Brookhaven National Laboratory at Upton, Long Island, N.Y.

It will provide scientists with one of the highest concentrations of neutrons ever produced in a research reactor. As the neutron comes to play an increasingly important role in one of the most vital problems of science, the nature and structure of matter, research reactors capable of providing higher neutron fluxes are being built.

Neutrons, as fundamental constituents of matter, are interesting in themselves. Moreover, because of their fundamental and simple nature, they are providing one of the most powerful investigational tools available to experimenters in such fields as solid-state and low energy physics, metallurgy, and nuclear chemistry.

Sixteen experimental facilities have been provided in the High Flux Beam Research Reactor (HFBR). Nine provide beams of neutrons for experiments outside the reactor and seven for irradiation experiments within the reactor, four of the latter for fast neutron exposures and three for thermal neutron exposures. To provide the nine beams of neutrons external to the reactor, neutrons are brought out through the shield in hollow beam tubes. The reactor design attains a maximum flux of thermal or slow moving neutrons for use in experiments to be conducted outside the reactor by an unusual design of the reactor core, reflector, and beam tubes.

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**IN SCIENCE**

## EDUCATION

**Urge Sea-Grant Colleges To Benefit From Sea**

► SEA-RESEARCH COLLEGES should be started in order to strengthen the lagging U.S. fishing industry and dredge valuable minerals from the ocean floor.

These "sea-grant" colleges could be set up in existing universities to develop the resources of the sea much as land-grant colleges have greatly increased benefits from the land, according to Sen. Clairborne Pell (D-R.I.) at a conference in Newport, R.I.

Within the next 10 to 15 years, oceanographic research could bring benefits of food, minerals and chemicals worth \$5.7 billion, Sen. Pell said. He has introduced a bill before the Senate to establish and operate sea-grant programs supporting research in the marine sciences.

Within the sea-grant universities could be colleges of aquaculture, marine experiment stations, fishery extension services and seagoing fishing port agents, he said.

Ocean research programs offer mankind many benefits, such as improving sewage disposal methods and expanding recreational opportunities.

Research could also bolster the U.S. fishing industry, which is slowly being eroded away by foreign competition and lagging technological progress. Once the second largest fishing nation in the world, the United States now stands fifth after Peru, Japan, Communist China and Russia.

Representatives from most of the state universities bordering the oceans and the Great Lakes attended the Sea-Grant Conference in order to urge establishment of sea grants to develop oceanic work. The conference was sponsored by the University of Rhode Island and the Southern New England Marine Sciences Association.

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## AGRICULTURE

**Green Light Lures Weevils to Lethal Trap**

► BOLL WEEVILS go on a green light to their death.

A lamp emitting light only in the blue-green region of the color spectrum is especially appealing to boll weevils, according to engineers and entomologists of the Agricultural Research Service, part of the U.S. Department of Agriculture. They are working at the Texas Agricultural Experiment Station.

This blue-green light lures the insects to a spot where they fall into a prepared trap containing lethal chemicals.

The fact that insects of many varieties are attracted to light has long been known, but now scientists are trying to design lamps with specific lights for specific insects.

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# E FIELDS

## MEDICINE

### Osteomyelitis Checked By Effective New Drug

► A NEW DRUG to combat the bone infection known as osteomyelitis is reported more effective than all previous medicines.

In recent tests the drug, Lincocin, appeared to be an ideal antibiotic for the disease, the Upjohn Company reported to an international gathering of specialists in antimicrobial agents and chemotherapy held in Washington, D.C.

Lincocin's particular virtue is its capacity to penetrate bone within minutes of administration and exit rapidly, Upjohn researchers said.

Since it does not remain in the body very long, there is less likelihood of a resistant bacteria arising. Also it rises to a high peak of activity against the disease germ.

Osteomyelitis is a widespread infection of bone, fatal in a small percentage of cases, but more often ending in permanent disability. It is usually caused by a staphylococcal germ.

Onset of the infection is signaled by pain in legs or arms and tissue swelling. Previous treatments have consisted of either an antibiotic or surgery or both.

Lincocin is active against most bacteria in the gram-positive category—notably staphylococci and pneumococci.

Other clinical evidence of the drug's efficiency came from Canada. Two Canadian physicians reported that Lincocin checked osteomyelitis after extensive surgery and other antibiotics failed.

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## PUBLIC HEALTH

### Dilute Smog by Planting Greenbelts by Freeways

► LATEST IDEA for diluting automobile smog: half-mile-wide "greenbelts" along both sides of our freeways, where no one, even a private homeowner, is allowed to burn anything.

"People near freeways are now breathing air that has been diluted with less than 1,000 parts of fresh air to one part of auto exhaust," says Prof. Albert F. Bush of the University of California at Los Angeles. For a sound air environment, we believe that the proportion should be at least 2,000 to 1."

To get the right mixture around an eight-lane freeway "at least one-half mile of open area on each side would be needed in which all burning processes, even from private homes, are excluded," says Prof. Bush, who heads the environmental laboratory of the UCLA engineering department.

The open spaces, converted to parks, could make for a healthier air balance in two ways. The unpolluted fresh air of the

parks could dilute and diminish the smog buildup above the freeways, and the green vegetation would actually remove pollutants and restore oxygen to the atmosphere.

While smog control devices on cars are badly needed, Prof. Bush does not believe that they can lick air pollution by themselves.

"There are no one- or two-shot solutions," says Prof. Bush. "The real answer lies in the sound overall management of our air resources. Such management requires, at a minimum, thoughtful and coordinated planning of the city's public works, including parks, highways, housing density, power production and industrial expansion.

Prof. Bush's conclusions are based on long-time studies of air pollution conducted with Prof. Herbert B. Nottage through the environmental systems and resources division of the UCLA engineering department, and on current research supported by a grant from the Engineering Foundation of the American Society of Civil Engineers.

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## NUTRITION

### Family of 12 Trained To Improve Family Diet

► A LOW-INCOME FAMILY of 12 and another one consisting of a mother and six children are receiving adequate nutrition as a result of training by a group of dietitians at Freedmen's Hospital, Washington, D.C.

Mrs. Hilda L. Moss and Mrs. Mildred S. Bunton of Freedmen's department of dietetics told the American Dietetic Association meeting in Cleveland, Ohio, that 10 dietetic interns spent a month in home consultation to prove that a family could be properly fed on a specified budget.

Mrs. Crozet W. Johnson, first assistant chief dietitian at the hospital, which is under the U.S. Department of Health, Education and Welfare, told SCIENCE SERVICE that the family incomes were augmented by the purchase of food stamps, issued by the U.S. Department of Agriculture.

Diets that had been composed largely of cornmeal, flour and lard, were changed to include the four basic diet groups: These groups include milk and milk products, meat, vegetables and fruits, and bread-cereal foods.

The larger family was composed of a father and mother with 10 children, ranging in age from 13 months to 18 years. They were not on relief, as the father was employed, but his wages did not provide enough milk or even three meals a day until after the food stamps supplemented the spending power.

Both families could purchase up to \$150 worth of food stamps at a much lower cost than face value. They were taught to watch the advertisements in the newspapers and to hunt for bargains, balancing carbohydrates, proteins and fats.

Although the families had appeared healthy before the interns started their assistance training, in some cases individuals were overweight from eating the wrong foods.

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## PHYSIOLOGY

### Compulsory Games May Cause Harmful Stress

► "COMPULSORY GAMES" such as are required in some schools can do more harm than good, experiments by a Tokyo physician indicate.

Regular exercise may not always be the appropriate recipe for health, long life and happiness, said Dr. S. Suzuki of Japan's National Institute of Nutrition at the International Physiological Congress in Tokyo.

Japan's official policy of encouraging all young people to make organized and serious sport a way of life caused Dr. Suzuki to do some experiments with rats to see just how beneficial exercise really is.

Postmortem examinations of the exercised rats showed much larger adrenal glands and more liver fat than in the unexercised control group. This meant that the exercised animals had undergone stress and strain beyond their powers of adaptation.

The adrenal glands, whether in humans or rats, secrete among other things the hormone cortisone, which has a profound effect on the basic metabolic activity of all cells in the body.

"It appears to be essential for the efficient utilization of energy released by the breakdown of food material. Cortisone itself is essential to life," Dr. Suzuki explained.

Any unusual environmental circumstances, such as extremes of cold and heat, or infection, or lack of oxygen in the air, are additional stresses which the body has to resist by using additional energy.

"The taking of exercise is a stress," Dr. Suzuki said. "Worry and discontent and anger and resentment are stresses. They all call for cortisone, and the adrenal gland usually obliges by secreting the extra hormone required."

However, when a prolonged and unusual demand is made upon the adrenals, they enlarge. If the demand is too great, metabolic disturbances result. Dr. Suzuki's exercised rats gave evidence that their adrenal capacity had been over-strained.

An editorial in *New Scientist*, 28:162, 1965, reviews the Tokyo experiments, saying that Dr. Suzuki had neither proved nor claimed that exercise is harmful. His experiments do suggest an interesting possibility on exercise stress in humans, however.

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## GENERAL SCIENCE

### 1964 Mineral Production Highest Yet Recorded

► ALUMINUM, copper, steel, zinc and other minerals reached an all-time high production peak on a world-wide scale last year, the U.S. Department of Interior's Bureau of Mines reported.

In an analysis of last year's production, the Bureau found that 43 out of 65 important minerals showed higher production than ever before. The United States still ranks first in production of 27 out of 53 commodities, according to their report, "World Mineral Production in 1964."

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