

NUTRITION

Protein Supplements Not Always Helpful

► PROTEIN FOOD supplements may sometimes have the opposite of their intended effect.

Protein supplements added to foods without considering other components in the diet may actually reduce the growth rate of animals, Dr. Alfred E. Harper of the University of Wisconsin has reported. The sensitivity of the body to the balance of amino acids is much more delicate than has been thought.

Experiments showed that animals fed an unbalanced mixture of amino acids will choose protein-free diets if offered, even if this means they will not grow at all. It has been thought that excess amino acids were simply burned by the body, but apparently this is not always so; sometimes they can be harmful, Dr. Harper said.

The effectiveness of protein supplements in the diet depends greatly upon the use the body can make of the amino acid in the blood stream, which is sometimes much less than predicted chemically. Often during the processing of the supplement changes take place in the proteins that make them resistant to the digestive fluids. The amount of amino acids available from these proteins is thus decreased.

To help underdeveloped areas, the United Nations is sponsoring studies of protein supplements in food. A sometimes fatal disease, kwashiorkor, widespread among the children in areas of protein malnutrition, may be prevented or even cured by proper diet, Dr. Harper said.

Drs. Juan Sanahuja and H. E. Muelendere and others assisted Dr. Harper, with support from the Nutrition Foundation of New York and the National Institutes of Health.

• Science News Letter, 80:320 November 11, 1961

EDUCATION

"Ghost" Schools Plague Uncrowded Rural Areas

► ABOUT 30,000 "ghost" school districts, usually located in depopulated rural areas and too small to operate efficiently, are part of the current "double crisis" in American education, the Population Reference Bureau reports in Washington, D. C.

The other and more widely publicized problem is the need for more school facilities in fast-growing city and suburban areas.

"Both situations breed educational and economic wastage," the Bureau notes.

Dwindling school enrollment, however, is just as serious a problem to some communities as swollen enrollment is to others. About one-third of the "ghost" districts have no more than 25 school-age children, and some have no children at all.

"Tiny classes waste the efforts of teachers who could effectively teach twice as many children in larger, consolidated schools," the Bureau maintains.

The one-teacher, "little red schoolhouse" still makes up about one-fifth of all public

schools, but is fading fast. Many small districts already have consolidated into larger, more practical units—sometimes by order of state authorities, since residents are often reluctant to give up tax advantages and local self-rule.

In the last decade, more than half of the states lost rural residents, although all states gained in urban population. Despite the overall United States population jump from 151,000,000 to 179,000,000, almost half of the nation's counties lost population.

While the nation was short 142,160 public school classrooms in 1960, about 15,000 classrooms were abandoned in sparsely populated regions.

Total enrollment during the new school year is expected to run 1,800,000 over last fall. The school-age population has grown twice as much as the total population, and more than five times as much as the age groups from which teachers are supplied, the Bureau said.

Operating costs for U. S. public elementary and secondary schools hit a record high of \$15.6 billion in 1959-60, a \$2 billion increase over 1957-58, according to the latest U. S. Office of Education biennial survey. Capital outlays for land, buildings and equipment, however, showed a seven percent drop. Average annual salaries for teachers, principals and supervisors rose from \$4,703 to \$5,135, a nine percent increase.

• Science News Letter, 80:320 November 11, 1961

VIROLOGY

Barnyard Animals Source Of Asian Flu Epidemic

► THE SOURCE of the great Asian influenza epidemic of 1957 may have been a pig, duck or chicken in a Chinese barnyard.

Dr. A. F. Rasmussen, University of California, Los Angeles, Medical School virologist, said that evidence collected in recent years suggests that human influenza viruses are related to a number of viruses that cause respiratory infections among certain domestic animals.

Because the Asian flu virus was markedly different from viruses that had caused previous flu epidemics, it may have sprung from some animal "reservoir" rather than from a mutation of a human virus strain.

Dr. Rasmussen recently returned from Formosa and Southeast Asia where he attempted to track an animal virus that may have been the culprit in the epidemic.

He found that the Asian flu virus and at least four animal viruses studied in Asia—swine, duck and equine influenza and fowl plague—are closely related. All these viruses had an enzyme, sialidase, that helps prepare the cellular invasion route of the virus, Dr. Rasmussen said.

None of the animal viruses so far studied is likely to be the culprit. But the similarity of the animal viruses to the Asian influenza virus supports the suggestion that some domestic or wild animal, perhaps on the Chinese mainland, may have harbored the original virus.

• Science News Letter, 80:320 November 11, 1961

IN SCIENCE

MEDICINE

Internal Cancer Linked To Skin Ailment

► A SIGNIFICANT RELATIONSHIP between the occurrence of internal cancer and a skin ailment has been found.

When a precancerous skin ailment known as Bowen's disease appeared on the unexposed trunk, arms and legs of patients a significant increase in the number of associated internal cancers was noted in a study reported in the Archives of Dermatology, 84:139, 1961, published by the American Medical Association.

Internal cancer was also linked to precancerous lesions on exposed areas such as the upper neck, face and hands, but this was reported less often true because of the difficulty in clearly establishing a diagnosis of Bowen's disease.

Conclusions of the report were based on a study at the University of Minnesota Medical School, Minneapolis, of the records of 53 patients in whom Bowen's disease had been diagnosed. The study was conducted by Drs. Edward S. Peterka, Francis W. Lynch and Robert W. Goltz.

The researchers combined data in this study with previous reports and concluded that approximately one-third of the patients with Bowen's disease develop internal cancer at an average of six to ten years after the first diagnosis of the skin ailment.

Thorough examinations for internal cancer, therefore, were advised especially for patients with Bowen's disease affecting unexposed parts of the body.

• Science News Letter, 80:320 November 11, 1961

OPTICS

Sending Light Signals Over Horizon Tested

► HOW LIGHT AND INFRARED signals can be transmitted beyond the horizon at night was reported to the Optical Society of America meeting in Los Angeles.

J. A. Curcio of the U. S. Naval Research Laboratory, Washington, D. C., said studies showed that detectable signals should be received at distances up to 200 or more miles, even when the transmitter and receiver are at sea level.

The light and infrared signals are indirectly transmitted and received because they are scattered by the tiny, aerosol-like particles always present in the earth's low atmosphere. Infrared is superior to visible light for such transmissions because it is not scattered as much by the atmospheric particles.

A high intensity xenon flash tube was used as a projector and an infrared sensitive photoelectric cell as the receiver in the Naval Research Laboratory experiments.

• Science News Letter, 80:320 November 11, 1961

CE FIELDS

BIOLOGY

Migratory Birds Carry Diseases Overseas

► **MIGRATORY BIRDS** in great numbers may spread diseases overseas.

Infected ticks carried as parasites by the birds are responsible for human illness as well as for destroying and stunting the growth of animals in many parts of Africa, Asia, Europe and the Americas.

Dr. Harry Hoogstraal, head of the department of medical zoology, U. S. Naval Medical Research Unit No. 3, Cairo, Egypt, said that control of tick species is made more difficult by the variety of their hosts.

"In newly developing nations that are desperately trying to raise their standards of living," Dr. Hoogstraal told the Naval Medical Research Institute, Bethesda, Md., "the numbers, weight and quality of domestic animals are vital to national well-being."

A tremendous loss of meat available to peoples of the world is caused by virus spread by migratory birds and their attached ticks, Dr. Hoogstraal emphasized. He said the causative virus of Russian spring-summer encephalitis (brain inflammation) has been isolated from a number of mammals and birds as well as from the ticks.

In Egypt, he recovered *Salmonella typhimurium*, a species causing fatal epidemics in some animals and food poisoning in man, from ticks in trees used as heron rookeries.

Dr. Hoogstraal said a large-scale integrated program with close cooperation between workers in virology, ornithology and parasitology would be needed to prove the role of migrating birds in spreading disease.

• Science News Letter, 80:321 November 11, 1961

EDUCATION

High School Biology Courses Modernized

► **BIOLOGY COURSES** for high school pupils are being brought up to date.

Memorizing long lists of scientific names and working in a "cookbook" type of laboratory are giving way to experiments that include out-of-class investigation by the more gifted science student.

Dr. Arnold B. Grobman, director of the Biological Sciences Curriculum Study, University of Colorado, Boulder, Colo., reports in *The Journal of Medical Education*, 36: 1253, 1961, that by the summer of 1962 new materials will have been tested in real classroom situations with about 50,000 students and 400 teachers.

Seven laboratory "blocks" now completed are: plant growth and development; microbes, their growth, nutrition and interaction; animal growth and development; interdependence of structure and function;

regulation in plants by hormones; animal behavior; and the ecology of land animals and plants.

These blocks were tested during the 1960-61 school year, and it is planned to design about five more blocks in the immediate future. In practice, a teacher would select one block for use during a particular school year, thus allowing for more flexibility.

New material also is being prepared for teachers of biology in recognition of the fact that a large number of high school instructors did not have adequate preparation. Many principals have asked teachers prepared in home economics, physical education or social studies to take on extra classes in biology because the enrollment was larger than expected.

The revolution in biological education is part of several major course improvement groups financed by the National Science Foundation. A large number of professional scientists on a university level have cooperated with high school teachers in planning modern courses.

• Science News Letter, 80:321 November 11, 1961

OCEANOGRAPHY

Private Industry Will Complete Mohole Project

► **REPRESENTATIVES** from oil companies and other industries have been bidding on a contract to complete the Government's Project Mohole. The project is an attempt to penetrate through the earth's crust to the underlying mantle.

About 12 companies have submitted proposals to handle the engineering and management of the spectacular project, the National Science Foundation said. The Foundation is financing most of the project.

Although the prime purpose of the project is to tell scientists more about the formation of the earth, oil industries will greatly benefit from the new drilling techniques and equipment developed.

The actual Mohole will probably be drilled in about three miles of water where it will penetrate through three miles of ocean-bottom layers to reach the mantle.

In preliminary tests conducted last spring scientists drilled a 600-foot hole in 11,700 feet of water to prove the feasibility of the project.

Project Mohole is the brain-child of the AMSOC (American Miscellaneous Society) of the National Academy of Sciences. Under the leadership of Willard Bascom, plans have reached the present stage of designing a new ship and equipment that will probably make the final probe in 1963.

The crystallizing project is now too large for the Academy, primarily an advisory group, to handle, and the organization has asked to be relieved from the project. The estimated cost of the entire project ranges from \$15,000,000 to \$50,000,000.

The National Science Foundation will shortly announce the winner of the new contract. Presumably, the contract will keep Mr. Bascom and his staff of experts on the project.

• Science News Letter, 80:321 November 11, 1961

GENETICS

Smokers' Lung Function Linked to Heredity

► **THE BREATHING CAPACITY** of tobacco smokers has been linked to heredity as well as environment.

In a study of 302 smokers and non-smokers in the out-patient department of the Sydney (Australia) Hospital, researchers reported that the effect of tobacco smoke alone does not account for decreased breathing capacity.

The mild climate and relatively unpolluted atmosphere of Sydney was believed favorable for the study.

Persons interviewed and tested for maximum breathing capacity and expiratory flow rate were representative of the general population and included friends accompanying the out-patients, as well as medical attendants.

Although smokers generally had eight to ten times more bronchitic symptoms than non-smokers, those who were smokers for a long time showed no increase in symptoms. There was also no tendency for heavy smokers to have poorer breathing capacity than light smokers.

The researchers said that the genetic make-up among smokers would determine whether a person coughed and developed bronchitic symptoms with serious loss of breathing capacity, or showed no symptoms and lost a small amount of ventilatory function.

Further investigation was suggested by Dr. John Read of the University of Sydney and Dr. T. Selby of Sydney Hospital, who report these findings in the *British Medical Journal*, Oct. 28, 1961.

• Science News Letter, 80:321 November 11, 1961

ASTROPHYSICS

Cosmic Rays Found Millions Years Old

► **THE COSMIC** radiation bombarding the earth from outer space travels millions of light years before reaching the earth (a light year is the distance light travels in a year at 186,000 miles per second).

Observations from high altitude balloon flights carrying cosmic ray recording photographic plates 136,000 feet above the earth's surface for seven hours allowed U. S. Naval Research Laboratory scientists led by Dr. Maurice M. Shapiro to determine the antiquity of cosmic rays by the relative abundance of light chemical elements in them.

About one-fifth of the chemical elements above helium in primary cosmic radiation consists of the light elements lithium, beryllium, and boron, in spite of the fact that the universal abundance of these light elements is exceedingly low, about one atom in a billion hydrogen atoms.

The new facts do not indicate that cosmic ray sources are as far away as millions of light years because the magnetic fields of the Milky Way galaxy bend the paths of the particles into very tortuous orbits and the cosmic rays, therefore, have taken a roundabout way in traveling to the earth.

• Science News Letter, 80:321 November 11, 1961