

AGRICULTURE

**On Return From Abroad,
Bring No Meats or Plants**

IF YOU ARE planning to go abroad, do not bring home any plants, bulbs, fruits or meats.

These and a number of other agricultural products you might care to bring back may be confiscated and destroyed by plant and animal quarantine inspectors of the U. S. Department of Agriculture's Agricultural Research Service.

Imports of agricultural products are regulated to prevent possible introduction into the United States of destructive disease-producing agents and insect pests.

Last year, the USDA said, 63% of all plant materials intercepted for violation of quarantine regulations were taken from incoming tourist luggage—21,000,000 pieces of it.

Inspectors found that an average of one in every 66 pieces of incoming luggage contained contraband plant material. They estimate that in port-of-entry inspection an important crop pest from abroad is intercepted every 20 minutes during a working year. Some of these pests may never before have been found in this country.

Similarly, nearly 65,000 pounds of prohibited meat products were confiscated from passenger luggage last year. Some came from countries where foot-and-mouth disease or rinderpest exist. These are serious livestock diseases that do not occur in the U. S.

Private importation of agricultural products for special purposes is possible under a permit, USDA officials point out. Such permits should be obtained, before leaving this country, from the Agricultural Research Service.

Science News Letter, May 14, 1960

ASTROPHYSICS

**Many Questions as to
How Sun Affects Earth**

WHAT GOES ON between the earth and the sun still remains much of a mystery, despite rocket and space probes.

There are many, often contradictory, theories concerning how much of the sun's mighty outpouring of radiation affects earth, and the other solar system planets.

Scientists know the sun is essential to any form of earthly life, but they do not agree on how the first living forms started, nor even about how the sun and its system of planets came into existence.

And concerning the more subtle effects such as the behavior of solar particles trapped in the earth's magnetic field, the exact cause of auroras, the occurrences of sudden disturbances in the earth's ionosphere, there is even less agreement.

The broad band of solar radiation has been available for study from above most of the earth's atmospheric blanket by rockets only in the last 15 years or so. With the launching of satellites and space probes, a new picture is beginning to emerge and many old theories have been discarded.

It has long been known that the space

between the earth and sun contains minute particles of matter—the so-called cosmic dust, cosmic rays, comets, magnetic fields, solar radio waves and many other kinds of electromagnetic radiation, including light.

At the present time, it seems that many of these factors react with each other in a far different and more complicated manner than was believed before they were studied directly. Simultaneous measurements from a satellite circling close to earth, for instance, and one of the two tiny artificial planets the United States has sent circling the sun, indicate that there is a direct correlation between changes in the magnetic field some five million miles from earth and close to the earth's surface.

This means there are sun-caused electromagnetic storms in deep space as well as near the earth. Among the observable earthly effects of such storms are auroras, blackouts in shortwave communications by way of the ionosphere, disturbances in the magnetic field and a decrease in the intensity of cosmic ray bombardment.

Science News Letter, May 14, 1960

PHYSICS

**Scientist Seeks to Tag
TB Germs by Chemistry**

BY ANALYZING the inherent chemistry of tuberculosis germs using modern laboratory methods, it may be possible soon to identify all strains of the bacilli quickly and easily.

Dr. H. M. Randall said at the American Physical Society meeting in Washington, D. C., that some chemical compounds have been identified in laboratory experiments using chromatography and infrared spectroscopy.

The trick now becomes that of finding chemical compounds that always show up in specific strains of the germs.

The University of Michigan physicist said it may even be possible to find in each strain a single chemical compound not found in other strains.

Some strains at present lack properties that positively identify them. Discovery of specific compounds for these strains "would not simply add another method of identification but would be the only method," he said.

Science News Letter, May 14, 1960

RADIO

**Low Frequency Signals
Give Very Accurate Time**

BROADCASTING on the very low frequency of 20 kilocycles, a radio station operated by the National Bureau of Standards, Boulder, Colo., is now transmitting the world's most accurate yardstick of radio frequency.

Within their range of thousands of miles, the signals will be used for research necessary to set up a world-wide broadcasting system of transmissions at the same low frequency for use by industrial and Government agencies requiring very accurate timing. Lowest frequencies picked up by a home radio are about 560 kilocycles.

Science News Letter, May 14, 1960

IN SCIEN

TECHNOLOGY

**Meter Measures Protein
In Quick and Easy Glance**

A FAST and easy-to-use device for determining the protein content of milk has been developed in Russia. It also "sees" proteins in samples of blood, lymph, urine and spinal fluid, and can estimate the presence of proteins in meat and wool.

The small "proteinmeter of fluorescence" has been built at the All-Union Institute of Cattle-Breeding by I. Kesunin and S. Konev, it was reported in a Soviet monthly magazine.

The device works because proteins glow under ultraviolet light. This glow, however, is not visible to the human eye. A special glass, called uranic glass, transforms the ultraviolet luminescence into visible light.

The brightness of the luminescence is measured with a light-sensitive electronic "eye" and converted into a reading on a sensitive ammeter.

To determine the protein content of milk, for instance, the milk is diluted 20 times and a small sample is taken. The protein content in milk with this method may be determined to within 0.1%.

Science News Letter, May 14, 1960

ENGINEERING

**Steam-dug Wells to Give
Water for Men in Ice Cap**

SOLDIERS and scientists who will spend next winter in Greenland's ice cap will drink water from wells drilled through snow and ice with steam. The U. S. Army Engineer Research and Development Laboratories at Fort Belvoir, Va., developed the new method.

Previously water was obtained by melting snow and ice, but this was costly and surface snow might be contaminated. With the new system, a bit using steam at 377 degrees Fahrenheit drills to about 150 feet or until homogenous ice structure is reached. Then a second bit that shoots jets of steam sideways is used to melt a bell-shaped reservoir up to 50 feet in diameter, from which water is pumped.

The well system will be used for Camp Century in which, for the first time, men will spend the winter months buried in the Greenland Ice Cap. To build Camp Century, snow plows dig tunnels which are roofed with steel arches and covered with snow. Prefabricated buildings are then assembled within the tunnel.

To supply steam, a portable generator made by Vapor Heating Corporation of Chicago for steam cleaning heavy railroad equipment will be used. Wells that have been pumped dry may be used to store foods, gasoline and machinery.

Science News Letter, May 14, 1960

CE FIELDS

MEDICINE

Sore Throats Dangerous To Hemophilic Patients

A SORE THROAT or a toothache can mean serious trouble or death for the person with hemophilia, or bleeders' disease.

R. A. L. Leatherdale, consultant anesthetist for hospitals in Bournemouth and East Dorset, studied 12 hemophiliacs admitted to hospitals because of swellings in the neck or mouth region. The swelling was caused by bleeding inside the tissues.

In a typical case, blood backed up into the gums and the tongue; in a few hours or days swelling became so great that the air passage was blocked or restricted. Doctors were usually able to correct such conditions by inserting a breathing tube and giving fresh blood or plasma. But there was one death among the 12 patients studied.

There seemed to be no one factor that caused bleeding to begin in the first place, Mr. Leatherdale reported in the *British Medical Journal*, April 30. In one case the patient bit his tongue, in four cases sore throat was a factor, in two cases the cause was related to dental condition, and in five the cause could not be determined.

The slightest damage will start bleeding in the hemophiliac and such persons have to be careful not to shout too much lest this cause enough throat damage to start bleeding.

Science News Letter, May 14, 1960

MEDICINE

Doctor Takes Long Look At Treatment of Obesity

IF A FAT person cannot stick to his diet, the only sure-fire way to lose weight is to go to a hospital where he cannot cheat on calorie intake.

In re-examining 161 obesity studies reported in the last 30 years, Dr. Alvan R. Feinstein of New York University College of Medicine has found that only those patients who were in a "completely restricted environment" (usually a hospital) always lost weight proportional to the prescribed calorie cut.

No other method, whether a special diet, pills, injections, group therapy or individual psychiatric help, has worked so consistently, Dr. Feinstein reports.

The old idea that obesity is due to an endocrine disorder and that injections of hormones would make reducing easier has almost become obsolete. There is now ample evidence that almost no obese patients have any "discernible primary hormonal imbalances" and that any loss of weight associated with hormone treatment is due to the simultaneous use of diet.

Misconceptions such as the endocrine disorder theory get started and keep going when research workers give incomplete

reports and use false logic to arrive at conclusions, Dr. Feinstein reports in the *Journal of Chronic Diseases*, 11:349, 1960.

A number of the reports studied claimed success during the first two months of dieting, when weight reduction is greatest. They then failed to indicate what happened later—whether the patients reached the desired weight or whether the particular method in question could be used effectively for long-term dieting.

Most overweight persons need some sort of watchdog to keep an eye on them. In many cases the doctor considers such people a bore. He admonishes them for being fat, gives them a calorie chart, and tells them to eat only so many calories per day.

This attitude has opened the door for non-medical solutions to overweight. Although commercial routines and prescriptions are usually based on reasonably sound knowledge, they are not geared to individual needs. Dr. Feinstein reports the obese person is chronically ill and should be treated accordingly.

Science News Letter, May 14, 1960

PHYSICS

Control System Starts Reactors Automatically

ATOMIC REACTORS can now be started up automatically with a new push-button control system.

Developed by Minneapolis-Honeywell Regulator Company's Brown Instrument Division in Philadelphia, the system controls the rate of fission (the splitting of atoms by neutron bombardment) during the entire period of reactor operation.

It was designed for the Atomic Energy Commission's experimental Plutonium Recycle Test Reactor (PRTR) now being built at Hanford, Wash., but can be adapted to any kind of reactor.

Development of the system grew out of the fact that manual control of moderator level in a reactor is extremely difficult. Also, a reactor of this type must achieve power rapidly if costly delays are to be averted.

The system is a two-phase push-button operation. First, the rate of fission is mathematically computed and controlled by special instrumentation which issues its own control signal. Once the reactor reaches a level of two megawatts, the operator, in the second phase, can raise power to any preset level up to 70 megawatts.

Science News Letter, May 14, 1960

EDUCATION

Fewer Farm Youths Plan to Go to College

ONE-THIRD of this year's high school seniors who live on farms definitely plan to attend college in 1960, a survey by the Bureau of Census of the Department of Commerce shows. City seniors do better; half plan for college. The survey also shows a larger percentage of city youths finish high school than do farm youths.

Science News Letter, May 14, 1960

BACTERIOLOGY

Survival of Fittest in Cell Immunity to Bacteria

SURVIVAL of the fittest may explain the immunity to bacteria exhibited by certain cells of the body, it is suggested by experiments by Dr. Eric L. Nelson and R. S. Berk, bacteriologists at the University of California, Los Angeles.

Their studies indicate that a resistant population of cells does not develop in an immunized animal through a direct alteration of existing cells causing them to become more resistant.

Rather it develops through a selective process in which all cells sensitive to the bacterial toxins are destroyed during immunization, and those which are naturally more resistant survive.

The investigators worked with a type of bacteria known as *Pseudomonas aeruginosa*. These bacteria cause infections of the eye, middle ear, urinary tract and burns.

The bacteriologists were primarily interested in effects of the bacteria on defense cells of the body which are produced by the liver, spleen and lymph nodes.

It is thought that the toxic substances produced by these bacteria act on a particular cycle in cell chemistry, perhaps the enzymes involved in this cycle. Radiation is thought to act on the same cycle.

It was found that defense cells from immunized animals, whether irradiated or not, destroyed *Pseudomonas* bacteria, while those from non-immunized animals lost their bactericidal activity following irradiation.

The same survival of the fittest cell mechanism is believed to be involved in problems of drug resistance of organisms.

Science News Letter, May 14, 1960

CHEMISTRY

"Mothball Fleet" Coating To Protect Museum

A SPECIAL PLASTIC coating used to "mothball" much of the U.S. fleet is also being used to protect the Guggenheim Memorial Museum in New York.

The coating is jointless, fills the hairline cracks characteristic of poured concrete surfaces, and expands and contracts with the structure itself. It provides a waterproof, abrasion-resistant surface, protecting the museum from erosion by wind, water, air pollutants and changing temperature.

Developed by the R. M. Hollingshead Corporation of Camden, N.J., it has been used to preserve stored ships, gun positions and other military equipment as well as to coat interiors of textile plants and pulp mills where acids and high humidity create exceptional corrosion problems.

Actually a series of coats, the coating includes a strongly adhesive primer, to make it adhere well to the building surface, and an outer coat of great cohesive strength, which means that it will hold together well under stress. It does not oxidize or erode, and architects predict that it will give the museum at least 10 years' service before any recoating is required.

Science News Letter, May 14, 1960