

## MEDICINE

**Fingernail Growth Cut By Measles, But Not Diet**

A GOOD CASE of the measles cuts down the growth of fingernails.

In fact, measles and kidney diseases appear to be the biggest inhibitors, Dr. Maarten S. Sibinga, pediatrician at New York University College of Medicine, explains.

Contrary to some beliefs, malnutrition and restricted diets do not alter the growth rate appreciably, he says. The average growth rate was found to be near .105 millimeters per day. This measurement was obtained by enlarging photographs taken daily of fingernails.

The average nail growth rate of males and females appears to be equal. However, fluctuations in growth rate were noticed at times in both sexes, the pediatrician said.

Since it is well known that the nails and hair grow after death, Dr. Sibinga measured the growth of the nails of three dead adults. The nail growth of two of them was followed for 10 days and that of the third was followed for eight.

Nail growth was found to be within the low normal average growth rate of live persons for the first two or three days after death. This was followed by a somewhat slower growth rate thereafter, and growth had not ceased at the time observations were discontinued.

However, within that observation period, Dr. Sibinga noted that measles appeared to have a more inhibiting effect upon nail growth than did death.

There are marked individual variations in the rate of nail growth at all ages, but for the same individual and the same nail the rate of growth is relatively constant and can be used to study the effect of various physiologic and pathologic disturbances, he concludes. Dr. Sibinga's report appears in *Pediatrics* (Aug.).

Science News Letter, September 19, 1959

## ASTRONAUTICS

**Shields for Astronauts Designed, Ready to Test**

THE HEAT SHIELD to protect the first American astronaut from blast-furnace heat as he plunges back into the earth's atmosphere will soon be tested.

The National Aeronautics and Space Administration has not yet chosen "the" heat shield that it will eventually use on the Mercury capsule. But at least two are being developed. Tests are expected to start this month.

One heat shield is a three-inch-thick plate of beryllium six feet in diameter. This is called a "heat sink" because beryllium has the quality of absorbing vast quantities of heat.

The second kind of heat shield is the "ablation" type. It is understood that NASA has several varieties of ablating materials under development. The characteristics of these materials, however, is to flake off, melt or vaporize as they grow hot, thus carrying away heat from the capsule. One ablating material is a mat of

glass fibers and resin. At least one other material already exists—the ablating blanket for Atlas nose cones. Composition of this is still classified.

However, it is known that a phenolic resin, reinforced with asbestos, was used for the nose cone of the Vanguard satellite rocket because of its high heat resistance.

These heat shields will have a tough job. The Mercury capsule will plunge through the earth's atmosphere at 17,000 miles an hour as it returns from its space flight. Several inches in front of this capsule, which resembles the smokestack of a pioneer locomotive, a cushion of air may reach temperatures of 10,000 degrees Fahrenheit. Inside the capsule will be one of the seven young men now being trained for the historic flight. If this man is to survive, the heat shield lifesaver must do its job well.

A NASA official said all types of the heat shields would be thoroughly tested, but implied that the ablation process probably has the "inside track." Although beryllium is a relatively light metal, the beryllium heat sink would add hundreds of pounds to the overall vehicle.

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## RADIO

**Radio-in-Space Provision Termed Pressing Problem**

MAKING adequate international provisions for space radio communications has been termed by a United States law expert "the most pressing current astronautical problem."

Andrew G. Haley, president of the International Astronautical Federation, told a London, England, meeting of the Federation that arrangements have been concluded with the International Radio Consultative Committee of the International Telecommunication Union for study of these radio-in-space problems:

1. What frequencies are especially suitable for penetration of the layers of the earth's atmosphere?
2. How does the time, season, geographical location and solar activity influence these frequencies?
3. What deviations in direction can be expected as radio waves penetrate the ionosphere?
4. What, if any, will be the difference in propagation between in-going and out-going signals relative to the earth?
5. Are special phenomena to be expected that do not occur in transmission between two points on earth?
6. What is the possible influence of the troposphere on wave propagation to and from satellites and rockets?

Some scientists, he said, believe the first commercial use of rockets will be for mail-carrying between New York and London. This service, and others, will be gradually extended to all quarters of the world.

National jurisdiction will be effectively maintained by the granting of launching and landing rights, he said, and thus there will be indirect national control with respect to point-to-point earth rockets.

Science News Letter, September 19, 1959

**IN SCIENCE**

## CHEMISTRY

**Russians Contribute to Element 102 Controversy**

THE RUSSIANS have contributed to the controversy concerning the discovery of element 102, heaviest element yet made by man in the laboratory.

More than a year ago, University of California scientists reported they had discovered an isotope of element 102, using the heavy ion linear accelerator built by the Atomic Energy Commission. Simultaneously they reported they had been unable to duplicate the work of an international team of scientists who reported in 1957 that they had discovered a 102 isotope.

Now the Russians, according to the Department of Commerce, have conducted experiments confirming the California experiments. G. N. Flerov, a corresponding member of the USSR Academy of Sciences, said a large group of Russian physicists and chemists first made element 102 in the fall of 1957 by bombarding plutonium with oxygen ions accelerated in a cyclotron.

Although the results of the Moscow and Berkeley experiments agree, they are not in accord with those obtained by the international team working in Stockholm.

The suggested name for element 102 is nobelium. However, the honor of naming an element traditionally rests with its discoverers. Who discovered element 102, and its name, continue to be controversial.

The Russian work is reported in the *Scientific Information Report*, a translation made by the Central Intelligence Agency and distributed by the Department of Commerce of information received from countries behind the Iron Curtain.

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## ROCKETS AND MISSILES

**Track Space Vehicles By Doppler Shift**

USING NO information except the time of the Doppler shift, earth satellites can be tracked by a single station for as much as 12 hours on end inside the limits of the solar system, Robert R. Newton, of the Applied Physics Laboratory of the Johns Hopkins University, Silver Spring, Md., told the International Astronautical Federation's congress, London, England.

The effective range of such a tracking station would be at least 30,000,000 miles.

The Doppler effect in radio corresponds to the change in pitch that a railroad whistle has when moving toward or away.

The Doppler system of measurement has only been used once before in this way. W. H. Guier and G. C. Weiffenbach, also Johns Hopkins scientists, used it to describe how six orbit functions of an artificial earth satellite could be determined during a single "pass" from one observing station.

Science News Letter, September 19, 1959

# E FIELDS

## MEDICINE

### 700,000 More Patients Cared For in 1958

THE NUMBER of cases cared for last year in hospitals in the United States increased 700,000 over 1957 figures, the American Hospital Association reports.

There were 23,697,000 hospital admissions in 1958, compared to 22,993,000 in 1957, statistics reveal in the annual Guide Issue of *Hospitals*, the association's journal. The information was compiled from questionnaires received from 6,786 hospitals in the continental U. S.

The hospitals reported an all-time high of 3,742,000 births in 1958. Each day last year there were more than 1,300,000 patients and 43,000 newborn babies in hospitals.

The hospitals reported total expenses of \$7,133,493,000, of which \$4,660,191,000 was for payroll. The hospitals employed 1,464,829 personnel in 1958 an average of 111 personnel per 100 patients, as compared with 107 in 1957.

Voluntary short-term hospitals cared for 15,825,136 cases: the average patient stay in these hospitals was 7.4 days. These hospitals spent an average of \$29.24 per day for the care of each patient, an increase of \$2.43 over 1957.

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## ELECTRONICS

### Plotter System Watches Airplanes Over U. S.

A SYSTEM has been developed for keeping track of all airplanes, friendly or unfriendly, approaching or flying over the U. S.

The new plotting system, called Iconorama, will be installed at North American Air Defense Command (NORAD) headquarters at Colorado Springs, Colo., and at Strategic Air Command (SAC) headquarters at Omaha, Neb.

Iconorama shows almost instantly the positions of aircraft thousands of miles away, such as those that might be detected by the Distant Early Warning defensive radar network.

By projecting the automatically drawn tracks on a big screen, it has been demonstrated that the system can do the work of six men at the old clear-plastic plotting boards used since World War II.

The Iconorama system expands traffic information handling capacity by 400%. It is expected to pay for itself in four years by obviating human plotters.

Traces made by the planes being tracked are drawn on a coated slide by a moving stylus. Data received over existing teletype lines are made to guide the stylus over the slide, scribing a special metallic coating. The slide plot measures only one inch square, yet overall error of the projected

display is said to be about one part in 1,000.

As many slides as needed may be used to cover a given situation. Each is projected, in register, on the viewing screen and in its own identifying color.

When the slides become filled with tracks, or the situation is over, the slides are replaced. Each removed slide can be filed as part of the flight record of the plane it represents.

Leasing contracts for the Iconorama system, made by Fenske, Fedrick and Miller, Inc., Los Angeles, call for installation to be completed at NORAD by July, 1960, and at SAC by October, 1959.

Iconorama units already have been installed and operated at the Pacific Missile Range, Point Mugu, Calif.; the White Sands Missile Range in New Mexico; the Atlantic Missile Range at Cape Canaveral, Fla., and the Naval Research Laboratory, Washington, D. C. Lockheed Aircraft Corporation also is understood to have signed a contract for use of Iconorama at its Palo Alto, Calif., control center.

Science News Letter, September 19, 1959

## ASTRONAUTICS

### Mars and Venus Sample To Be Studied at Harvard

SAMPLES of the "air" from Mars and Venus, simulated to the best of present knowledge, will be studied in a Harvard University research laboratory.

Under a \$300,000 grant by the National Science Foundation, Harvard scientists will use the simulated gas mixtures to learn about entry problems in the atmospheres of Mars, Venus and other planets. Their aim is to find what space ships will face when entering the atmospheres of planets at temperatures of 18,000 degrees Fahrenheit.

The work is part of a program of space-age basic research financed by the National Science Foundation. NSF has also granted \$500,000 to Massachusetts Institute of Technology for studies of possible methods of controlling the H-bomb process of fusion, and for studies of space and space craft. The Harvard and MIT grants are both for two-year periods.

Harvard scientists also will study rocket propulsion using electromagnetic fields rather than chemical reactions, the basic process of combustion in various mixtures of gases and liquids, the hydrogen fusion process, sunspots and solar flares.

At MIT all work will fall within the framework of a "plasma dynamics program." It will include the study of ionized gases, or plasmas, such as exist in the upper atmosphere of the earth. Plasmas also are found in fluorescent light tubes and in the sun.

MIT scientists will explore the nature of plasma through which space craft some day will have to pass. Also to be studied are plasma effects on reentry of nose cones and missiles, plasma as a factor in radio communication, production of plasma using microwaves, and study of microwaves which plasmas themselves emit.

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## MEDICINE

### Liver Diseases Spotted By Radioactive Technique

DIAGNOSIS of cirrhosis and other liver ailments is being aided by a new radioactive technique that measures the time it takes blood to flow from the heart to the liver.

The technique was developed at the University of California Medical Center, Los Angeles, by Drs. Ismael Mena, Leslie R. Bennett, Raymond Kivel, Joseph Scallon and Sherman M. Mellinkoff.

Basis of the procedure is the time it takes for injected radioactive serum albumin to go from the heart to the liver. Two external scintillation counters (which measure degree of radioactivity) are used to determine this. One is placed over the heart, the other over the liver.

In cirrhosis of the liver the organ becomes damaged so that blood flow through it is progressively slowed. This creates a pressure area in the portal vein, one of two ports of entry for flow into the liver. (The other is the hepatic artery.) The decreased rate of flow of the blood containing the radioactive material into the liver is a reliable indication of the degree of liver damage.

The procedure is not specific to liver disease. For example, obstructions in blood vessels, such as hardening of the arteries or blood clots in veins, may delay the arrival of the blood's radioactive "passenger" into the liver.

However, results of the procedure taken in conjunction with the patient's history and other clinical findings has proved very useful in diagnosis of liver conditions.

More than 800 subjects have been studied with the new procedure, and it has been found consistently helpful in diagnosing cirrhosis, the UCLA medical scientists reported.

Science News Letter, September 19, 1959

## BIOLOGY

### Virus Sickens Plant But Aids Insect

THE FIRST PLANT virus known to help out an insect has been reported.

The plant virus, known as "aster yellows," increases the number of foods the tiny corn leafhopper can eat, Dr. Kark Maramorosch of Rockefeller Institute, New York, told scientists at the American Phytopathological Society meeting in University Park, Pa.

The aster yellows virus, which affects asters, lettuce, spinach and carrots, is carried from sick to healthy plants by another tiny insect, the leafhopper. This insect is also slightly affected by the virus which lives and multiplies inside it.

However, Dr. Maramorosch explained, when the corn leafhopper sucks up the virus, it then is able to feed and thrive on healthy asters and carrots—foods that normally would have poisoned the insect.

This may mean an "entire new field of research" into the possible beneficial effects of plant viruses, the scientist concluded.

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