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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE • SEPT. 6, 1947

Hydroponic Harvest

See Page 154

A SCIENCE SERVICE PUBLICATION

PHYSICS

100-Mile Ascent Possible

Human passenger could ride on V-2 rocket and could describe his trip by radio. Only drawback is that he could not land alive.

➤THE MOST exciting ride in the world, a few-minute trip to higher than 100 miles above the earth, could be made today by a human observer who could tell about it.

The ride, a trip aboard a V-2 rocket, would probably kill the rider, but not until he had been able to radio his story of most of the flight. Death would come from the impact upon return to earth. "Progress is being made" toward solving the problem of safely landing a human passenger on a high-altitude rocket, explains Dr. J. A. Van Allen, physicist at the Applied Physics Laboratory of the Johns Hopkins University, Silver Spring, Md. But, he adds, it would be "most immoral" to accept any volunteer's offer to ride a V-2 today.

Meanwhile, the scientist offers the next best thing, and a far safer one: a scientific account of the first passenger trip on a V-2 rocket shot 100 miles above the earth.

Dr. Van Allen gives his account of the imaginary ride of the future in *The Explorers Journal, (Summer)* published by The Explorers Club, New York. The flight would be made in a missile such as one of the V-2's now being fired at White Sands, N. Mex.

As the missile takes off from White Sands, powered by enough fuel to drive an automobile from New York to San Francisco and back seven times, the roar of the jet sounds "like a million blowtorches in unison" to our human passenger. As the rocket climbs, the observer inside the rocket is forced deeper down into his seat by the force of acceleration.

Half a minute after the take-off, the rocket is traveling faster than sound. Suddenly, the roar of the jet stops.

In a few seconds movement becomes difficult for the missile passenger.

"The toughest part of the ride is at hand. His head throbs, his eyes lose focus."

But 70 seconds after the take-off, our hero again rouses to full consciousness. The missile's fuel is exhausted. Silently, the first human missile rider travels high above the earth. Through powerful binoculars, he can look down at Elephant Butte Reservoir, the Rio Grande River, El Paso and Albuquerque. Toward the horizon he can see the Pacific Ocean and the Gulf of California.

As he rises, he must grasp a safety handle, for he is free of the force of gravity. His binoculars float in front of his face as he releases them.

Six minutes after the take-off, the rocket is descending from more than 100 miles altitude, falling back toward the earth. The first missile rider in history pulls a lever.

"The entire compartment is explosively separated from the remainder of the missile. A small parachute flutters out, is quickly torn away with a jerk. Another and another follow. Finally, one holds.

"The main 'chute opens. The entire compartment swings gently from the shrouds. The observer sees the after-body of the missile strike the desert far below him and toss up a huge crater of sand and boulders.

"He drifts slowly downward to the surface, rolls over a few times, opens the compartment and steps out.

"This," concludes Dr. Van Allen, "is exploration of the future."

Science News Letter, September 6, 1947

AERONAUTICS

Skystreak Sets Record

Behind the design of this turbo-jet plane lie twenty years of research. Is result of cooperation between NACA, Navy and Douglas engineers.

➤THE NAVY Skystreak research plane, that just flew faster than any piloted plane has ever flown before, owes its superiority to cooperation in design between the National Advisory Committee for Aeronautics, Navy aviation experts and Douglas engineers. It was built by the Douglas Aircraft Company.

This plane now holds the world's speed record. It flew four times over the Army test course at Muroc Dry Lake, Calif., at an average official rate of 650.6 miles an hour, beating the record of the Army Shooting Star by 27 m.p.h.

Behind the design of the Skystreak are some 20 years of investigation of flight by the National Advisory Committee for Aeronautics made in its laboratories and various types of windtunnels. It is in these that the shape of wing, control airfoil and fuselage best suited for sonic flight has been determined.

This Douglas Skystreak, known in the Navy as the D-558, is a low-wing monoplane that does not differ much in general appearance from other fast jet-propelled planes. It is powered with a General Electric TG-180 turbo-jet engine similar to those used in other planes. Its air intake is centered in its nose. Its fuselage is bullet-shaped. Its wings and airfoil controls are especially designed on NACA standards for high speed. In body construction, it was built much stronger than ordinary planes so that it can better withstand the shock waves and pressure at high speeds.

The Skystreak made its first flight on May 28, 1947. Since then it has been put through a testing program at greater and greater speeds. The procedure followed was to fly the plane in each testing program first at a six-mile altitude at a designated "Mach Number." This is the ratio of its speed to that of sound at the particular altitude.

The speed of sound, which is limited by the ability of the air to adjust itself to the pressure of the sound waves passing through it, is approximately 760 miles in ordinary temperatures but only some 660 miles in the extremely low temperatures seven or eight miles up.

After the plane reached at high altitudes the designated Mach Number, it was put through maneuvers to reveal impending buffeting, or loss of control or stability. Then the plane, at lower and lower altitudes, was flown at a speed to reach the same Mach Number. This means at an increase in true speed, but with little change in aerodynamic problems. Thus, phase by phase, the plane inched toward its goal of flight in the transonic speed range.

Science News Letter, September 6, 1947

NUCLEAR PHYSICS

New Atomic Pile Revealed

"Fast reactor" uses man-made plutonium as energy source and sets up chain of fissions with neutrons moving thousands of miles in every second.

➤ THE NEW kind of atomic energy machine or "pile" announced at Los Alamos is essentially an atomic bomb that can be kept under strict control and made to release its energy slowly.

The "fast reactor," as it is known, uses the same kind of fast neutrons (moving thousands of miles per second) that set up the very speedy chain of fissions of plutonium atoms in the explosive bomb. Neutrons are fundamental particles of matter that can smack into the hearts of fissionable atoms and tear them asunder.

For the first time, too, a controlled atomic energy source uses the man-made bomb element, plutonium, instead of the uranium that occurs in nature.

While the new "fast reactor" is not in itself a practical source of power in its present form, it does explain why those who have known what has been going on were not too enthusiatic about the power production possibilities of the older type of atomic piles which use the slow neutrons.

Dr. Norris E. Bradbury, scientific director of the Los Alamos Scientific Laboratory, in announcing that the new atomic energy plant has been operating since last November, called it "another step" toward finding the best kind of atomic power plant.

The immediate use of the new atomic pile is to study under controlled conditions highly concentrated, intense and very high velocity neutrons, hitherto only obtained from the actual explosion of an atomic bomb.

The similarity of the new reactor and the actual atomic bomb is emphasized by the fact that all other reactors have their nuclear fuel mixed with some diluting substance, such as very pure graphite or heavy water, which slows down the neutrons. The new pile has no such material in it and it is also known that the bomb also has no such extraneous material in it.

Development of the fast reactor now announced presumably cost one human life, that of Dr. Louis Slotin, who was victim of a radiation accident at Los Alamos in May, 1946. Dr. Slotin is understood to have received a fatal dose of radiation when he separated with bare hands masses of fissionable material that were beginning to shine with a blue glow, a preliminary to what probably would have been a disastrous atomic explosion. His self-sacrifice probably saved the lives of fellow scientists and the experimental set-up that has now brought forth the new atomic device.

A husband-and-wife team of physicists, Drs. David B. and Jane Hamilton Hall, is in charge of the fast reactor and its various experiments, while the engineer in charge is Robert I. Howes.

Science News Letter, September 6, 1947

SKYSTREAK—This research plane, designed to explore speeds close to the speed of sound, has set a new record. It is made by Douglas and flown by the Navy.

AERONAUTICS

Radio Guide System Has Dots in "Natural" Places

➤ A NEW instrumental guiding system for airplanes seeking to land in thick weather, especially at night, has just been patented by two New York inventors, E. M. Deloraine and G. J. Lehmann.

Most instrument systems present their data on various dials and screens on the plane's instrument panel. But pilots have a tendency, ingrained from lifelong habit, to try to see their way through fog or rain by peering through the windshield for visible landing lights on the field.

The Deloraine-Lehmann system undertakes to work with this natural tendency instead of fighting against it, by placing a screen directly in front of the pilot's eyes, so that the bright dots representing the positions of the radio guides are in the same position as the landing-field lights.

On the same pedestal with each of the latter, they propose to place a low-power radio sender. Signals from these senders, picked up on the plane's antenna, are translated into light-dots by a scanning oscilloscope and projected onto the screen with suitably-arranged lenses and mirrors.

The view through the windshield is otherwise unobstructed, so that if the pilot can get sight of the visual landing aids he will be reassured by seeing them in exactly the same positions as the radioed light-dots on his screen.

Patent 2,426,184, issued on this system, is assigned to the Federal Telephone and Radio Corporation of New York.

Science News Letter, September 6, 1947

PHYSIOLOGY-GENETICS

Study Atom Bomb Effects

Long-range research program on radiation results on Japanese children and their children will be undertaken by NRC and Atomic Energy Commission.

➤ THE EFFECTS of radiation from the atomic bomb on Japanese children and their children's children will be investigated in studies under the guidance of American experts including the genetics authority and Nobel Prize winner, Dr. H. J. Muller of the University of Indiana.

The studies will be part of a long-range research program to be undertaken jointly by the Atomic Energy Commission and the National Research Council.

The effects of atomic radiation on blood cells and on the development of various disease conditions, including the formation of peculiar scar tissue called keloids, will also be studied.

Knowledge important for protecting the health of workers in atomic energy production plants and everyone living in the atomic age may come from the studies.

Excellent health safety records have been maintained in the atomic energy industry. And there is no reliable evidence so far on which to base an opinion about the frequency of abnormalities among children born in Hiroshima and Nagaski since the atomic attacks. But with radioactive substances playing an increasingly important role in everyday life in the United States and perhaps elsewhere, medical authorities believe it important to gain all possible information on the subject.

The long-range research program is a result of a directive issued by President Truman. It will be financed by the Atomic Energy Commission and the scientific program will be directed by the National Research Council's committee on atomic casualties. As far as practicable, Japanese scientists will take part in the studies under arrangements to be made with Gen. MacArthur's staff.

Dr. Thomas M. Rivers of the Rockefeller Institute is chairman of the committee on atomic casualties. Other members are: Dr. George W. Beadle, California Institute of Technology; Dr. Detlev W. Bronk, National Research Council; Dr. Austin M. Brues, Argonne National Laboratory; Dr. George M. Lyon, chief of the Radioisotope Research Section, Veterans Administration, Washington, D. C.; Dr. Shields Warren, Harvard Medical School; Dr. Stafford L. Warren, University of California; Dr. George H. Whipple, University of Rochester; Dr. Raymond E. Zirkle, University of Chicago.

The studies in heredity and genetics will be under the guidance of Dr. Muller and Drs. C. H. Danforth, Stanford University; D. R. Charles, University of Rochester; L. H. Snyder, Ohio State University; and James V. Neel, University of Michigan, who will be in charge of the field studies in Japan.

Science News Letter, September 6, 1947

NUTRITION

Britain Could Raise Own Food, But Shouldn't

➤ BRITAIN could raise all her own food on the land of her own home islands, declared H. D. Walston, farm leader in eastern England, speaking before the meeting of the British Association for the Advancement of Science in Dundee, Scotland. But, he added, Britain should not attempt any such program, because it would necessitate permanent radical changes in the kingdom's living standards.

One reason why more acres are not being farmed in Britain, and why those now under cultivation are not pushed to higher yields, the speaker said, is lack of incentive. While farm rents have remained stable for some 50 years, farm wages have been increased sixfold since 1910. Consequently the urge has been to increase the yield per man rather than the yield per acre.

Mr. Walston expressed himself as opposed to the idea of complete national self-sufficiency in food production:

"We could grow any crop we wished here if we went to sufficient trouble, but the less suitable the natural environment the more trouble we have to take. This results in less efficiency because of the greater effort needed to overcome nature. We should work with nature rather than against it, encouraging natural crops such as vegetables and fruit, grain, particularly in the Eastern Counties, and above all grass, and with it livestock. Grass should be the main crop of British agriculture, other crops being supplementary. . . .

"Only two types of people live entirely on home-produced food—the subsistence farmer who has no money to buy food elsewhere; and the rich industrialist whose dividends pay for the loss on his farm. We no longer have the dividends and it would be a curious ambition to want to revert to subsistence farming if we don't have to."

Self-sufficiency, the speaker concluded, does not mean the ability to produce a complete range of products, but the ability to produce sufficient wealth to permit trading with other countries.

Science News Letter, September 6, 1947

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PUBLIC HEALTH

DDT Tested Against Polio

Outbreak in Wilmington, Delaware, causes that city to attempt to kill off all flies, suspected of spreading infantile paralysis. Sprayed from planes and on ground.

➤ INFANTILE paralysis gives signs of levelling off throughout the nation. At the same time a sharp outbreak in Wilmington, Del., has turned that city into a proving ground for trial of DDT as an anti-polio weapon.

A total of 529 cases for the nation were reported from state health officers to the U. S. Public Health Service for the week ending Aug. 23, latest on which official figures are available. This is an increase over the 411 reported the previous week. But it is only a 28% increase, whereas there was a 47% increase during the preceding week (Aug. 16). The drop in percentage increase is what suggests that the polio season may be drawing to an end.

Delaware is having the largest amount of infantile paralysis for the size of its population, that is, the highest incidence rates, of any state. Latest figures for the state, obtained by special request of the U. S. Public Health Service to the state health officer, show that the state has had 78 cases from the first of the year through Aug. 25. Of these, 19 occurred on Aug. 22, 23, 24 and 25. Of the total since the first of the year, Wilmington has had the majority (57).

Wilmington has already had one spraying with DDT and will have another within a few days. The spraying, done from airplane and also by crews operating sprayers on the ground, is under the direction of Drs. Vernon B. Link and Griffith E. Quimby of the U. S. Public Health Service's Communicable Disease Center with headquarters in Atlanta, Ga.

Object of the spraying is to kill flies which are suspected of spreading infantile paralysis. Whether flies actually do spread the polio virus and whether, if so, they are the only means by which it spreads are two questions that have not yet been definitely answered.

If infantile paralysis cases drop off suddenly in Wilmington about two weeks from now, health authorities will feel that the case against flies is much stronger. They will not be convinced that flies spread the disease until they have had experience in eight or 10 outbreaks in which cases drop sharply after flies have been routed.

Attempts to get evidence for or against flies as polio spreaders have been made with DDT before. One widely publicized was that in Rockford, Ill., in 1945. The fly population was reduced, but results on infantile paralysis were not conclusive. The reason was that the spraying was not done until the peak of the outbreak had been reached, so it was impossible to tell whether the drop in cases was due to the drop in flies or would have come anyway.

In Wilmington, the spraying has been started much earlier in the outbreak, so health authorities are hopeful that they will get more definite results. A drop in cases in less than two weeks would not be expected, because some will already have been infected before the spraying started. Ordinarily an outbreak would be expected to run for two months, so a drop in cases before then, especially a sharp drop, is the thing to watch for.

Elsewhere throughout the nation, no state reported more than 54 cases for the week ending Aug. 23 and five states reported no cases. The 10 states with largest numbers of cases were: New York, 54; Illinois, 53; Ohio, 50; Delaware, 29; Massachusetts, 27; Michigan, 25; California, 22; Wisconsin, 21; Pennsylvania, 21, and Minnesota, 20.

Science News Letter, September 6, 1947

PHYSICS

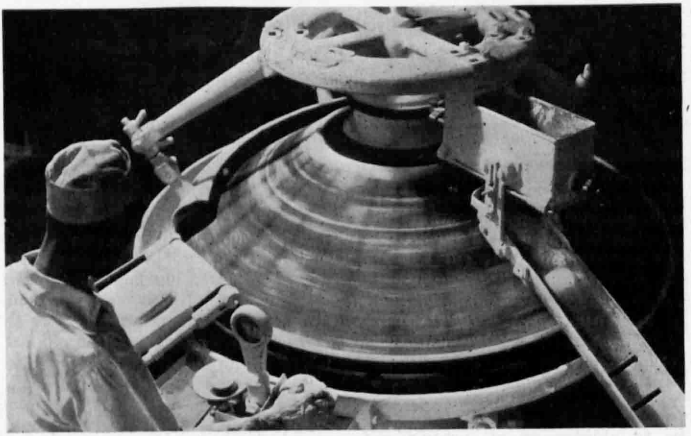
Training Young Scientists Important Atomic Problem

➤ THE TRAINING of young scientists to carry on future atomic research may be more important to national security than any other thing being done now, David Lilienthal, chairman of the Atomic Energy Commission, said after the full commission had spent three days reviewing research progress at the University of California's famous radiation laboratory.

Development of junior scientists within the next five to ten years to carry on the work of the great scientists now probing the atom is of utmost importance, Chairman Lilienthal and Commissioner Sumner Pike stressed. Training of young scientists is to be encouraged by the commission within the framework of the policies of the individual universities.

New discoveries in basic atomic energy facts should be expected in the future as the result of the research now in progress, Chairman Lilienthal declared.

Science News Letter, September 6, 1947



***STEEL AND BREAD**—Machinery bakes bread, handling the process from the time the grain reaches the mill. This rounder takes accurately divided pieces of dough and turns out round, flour-sprinkled balls which rise on trip to the moulder which kneads and shapes the dough.*

PHOTOGRAPHY

Electric Camera Shutter

New device operating with Kerr cell takes pictures in four hundred-millionths of a second. Has no moving parts.

➤ A CAMERA with an effective exposure time of four hundred-millionths of a second (0.000,000,04 seconds) was described to the American Institute of Electrical Engineers by A. M. Zarem, F. R. Marshall and F. L. Poole of the U. S. Naval Ordnance Test Stations at Pasadena, Calif. It was used in photographic studies of electrical discharges.

The novelty of the device is an "all-electrical" shutter, the heart of which is a Kerr cell, named after Dr. J. Kerr of Scotland who discovered its principle in 1875. The Kerr cell shutter has no moving parts. Cameras using this shutter are expected to have many applications for ultra high speed photographic work.

The novelty of the cell consists in the fact that the polarized light used can not pass through it except when the cell is supplied with an electric field. The speed of operating, therefore, depends upon the rapidity with which a required voltage can be applied to the cell electrodes.

The ordinary Kerr cell is composed of two flat plates, or electrodes, immersed in a fluid which becomes what scientists call "birefringent" upon the application of an electric field. This means that it is doubly refractive. Many fluids might be used; these scientists found that nitrobenzene seems to have the highest Kerr constant.

When this cell is placed between polarizers crossed for minimum transmission of light, the arrangement becomes an optical shutter. A polarizer is a material which transmits only those light waves that vibrate in one plane. The waves of ordinary light vibrate up and down, and from side to side. In this so-called Kerr optical shutter, a voltage applied to the electrodes has the effect of altering the state of polarization of light, and permits transmission through the second polarizer.

Science News Letter, September 6, 1947

PHOTOGRAPHY

Three-Dimension Pictures

Life-like pictures that require no colored glasses or other gadgets for viewing are taken with wide-angle lens on film with tiny ridges.

➤ LIFE-LIKE pictures which will let you actually peek around corners, the way you see objects in real life, will soon be shown to the public.

Three-dimensional pictures will probably make their debut at the Naval Photographic Center, Anacostia, D. C. The photographic system, called "Trivision," will be shown by its inventor, Douglas F. Winnek of Mount Vernon, N. Y., under the auspices of the Navy. Inventor Winnek is now putting the finishing touches on his equipment at the Navy's Aeronautical Photographic Experiment Laboratory at the Philadelphia Navy Yard.

No special seeing devices or other gadgets are used to get depth in trivision pictures. Tiny, almost invisible ridges on the film are the heart of trivision's three-dimensional pictures.

Here are some of the developments predicted for the new stereoscopic photography:

Snapshots in which you can look slightly around the object in the picture.

Three-dimensional X-rays which may help tell surgeons just how deep to cut.

Paper-print trivision for magazine covers and advertisements.

Display advertising in subways and windows with the "deep" trivision view.

Printing-press reproduction for depth in news shots.

More accurate depth in aerial photographs.

Educational and training pictures with greater perspective. This is one of the Navy's interests in trivision.

Further in the future, but entirely possible some day, are life-like, three-dimensional motion pictures using trivision.

When trivision becomes available generally, your best three-dimensional pictures will be taken with a wide-lens camera. The lens used in the Navy's trivision camera is 10 inches in diameter.

In the new system, ridges, or lenticulations, on a transparent picture surface are applied to the film. These ridges serve as thousands of tiny lenses taking many pictures when the film is exposed in the camera. The picture is a composite of many pictures. The large lens of the camera, wider than the separation between an observer's eyes, gives several binocular views.

Navy trivision equipment developed by Mr. Winnek includes a press for putting the ridges on film surfaces, a single-lens camera and an enlarger printer for performing a peculiar and critical movement of the film during enlargement or reduction of a picture.

The story of trivision and its inventor has some of the elements of both the life of Edison and the famous Horatio Alger tales. Mr. Winnek, now only 40 years old, first became interested in three-dimensional pictures as a movie usher in his boyhood, and later doing publicity for motion pictures. At one time, Radio-Keith-Orpheum backed his attempt to produce depth in pictures, but the depth turned out to be fuzziness from vibrations.

A dozen years ago, Mr. Winnek made the discoveries that led to trivision. By 1940, he was able to demonstate his system to the Temporary National Economic Committee in Washington. At that time, he showed his work to Science Service. Through this institution, the Research Corporation in New York was interested in trivision and supported his work for several years.

The U. S. Naval Photographic Service became interested in the possible military applications of the system, and the inventor has worked with the Navy for the past two years, perfecting his method of producing more life-like pictures.

Science News Letter, September 6, 1947

In about one-fifth of the land of the world there is a permanently frozen *stratum* either on, or at variable depths below, the surface.

Automobile *tires* when under-inflated give more traction but wear out faster; the increased traction is due to the wider surface in contact with the road.

METALLURGY

New Alloys Stand Heat

Ceramics also among materials developed for use at tremendous temperatures in gas turbine engines and superchargers. Stand up to 1,500 degrees Fahrenheit.

➤ GAS turbine engines, the coming power plants in many applications ranging from airplanes to trucks and buses, are possible because scientists succeeded in developing metal alloys capable of withstanding very high temperatures over long periods, the American Society of Mechanical Engineers was told by Dr. Clyde E. Williams, director of Battelle Memorial Institute, Columbus, Ohio.

A group of new super metals and ceramics soon will be available for man's new high-powered machines, the turbo-jet, rocket and atomic energy power plants, he said. They will withstand higher temperatures and pressures than materials now available, and so will offer potentialities for power generation that are "simply staggering."

Materials developed during the past decade withstand high stresses and temperatures up to 1,500 degrees Fahrenheit, Dr. Williams said. These made the present gas turbines possible, and also the superchargers which furnish air to the engines of high altitude bombers and fighters, and to the gas turbines in jet planes. Engineers are now asking for material that will withstand 1,600-degree heat.

For the supercharger, disk materials must withstand a temperature of 1,100 degrees Fahrenheit under high stress. For this purpose, chromium-nickel-cobalt-iron alloy, strengthened with such other elements as molybdenum, tungsten, columbium or titanium, is used. The gas turbine blades used in superchargers and jet engines are subjected to temperatures of 1,500 to 1,600 degrees, and the metal sometimes reaches a temperature of 1,500 degrees Fahrenheit.

To secure stability, still more highly alloyed materials must be used and some are practically free of iron. The strongest materials suitable for precision casting are the cobalt-base alloys containing 40% to 70% cobalt and such other additions as chromium and molybdenum, or chromium, nickel, molybdenum, tungsten and columbium.

Another series of alloys, based on chromium, with upwards of 50% of this metal, is showing great promise. An example is one that contains 60% chromium, 15% to 25% molybdenum, balance iron. This alloy must be melted and cast in a vacuum. In preliminary tests it shows up better than the cobalt-base alloys.

The high-temperature super metals developed for the gas turbines, and improvements on these yet to come, will be useful, but to meet the highest temperatures these will not suffice and ceramics materials will be called for, Dr. Williams stated. These ceramic materials, made up from the most highly refractory substances such as oxides of beryllium, aluminum, magnesium, zirconium, and so on, are the only known materials that will not melt or burn up at the high temperatures that may be required. They may be used as coatings for metals, as structural combinations with metals, or as individual parts.

Science News Letter, September 6, 1947

BIOLOGY

New Antibiotic from Soil Discovered in England

➤ WHOOPING cough, typhoid fever and other diseases untouched by penicillin may yield to a new disease remedy from germs, called aerosporin.

This new potential remedy comes from a bacterium found in the soil in Surrey and Yorkshire and also in the tap water in an American city, Chicago.

Discovery of aerosporin is reported by Drs. G. C. Ainsworth, Annie M. Brown and G. Brownlee of the Wellcome Physiological Research Laboratories, Beckenham, Kent. (*Nature*, Aug. 23)

Aerosporin is extracted from the broth in which the bacterium grows by methods like those used for extracting streptomycin. Streptomycin also comes from an organism found in the soil, but its parent organism is more like a mold than a bacterium. And streptomycin has also been reported active against the germs of whooping cough and typhoid fever.

Aerosporin not only checks the germs but actually kills them, Dr. Ainsworth and associates report. Another advantage is that apparently disease germs will not grow resistant to it as they do to sulfa drugs, penicillin and streptomycin. At least, the Wellcome scientists were unable to make germs acquire resistance in test-tube experiments.

The new chemical is readily produced, relatively stable and weight for weight is as powerful against one class of disease germs as penicillin is against another.

Science News Letter, September 6, 1947

Home-rendered *lard* is in less danger of getting rancid with age if a pound or so of vegetable shortening is added to 25 pounds of the lard when it is made.

INVENTION

Chinese Typewriter Shown By Author-Inventor

➤ THE MINGKWAI typewriter, which types 90,000 Chinese characters and also can type in Japanese, Russian or English, has been demonstrated by its inventor, Lin Yutang, the Chinese author of best-selling American books.

The unique machine, about the size of a standard American model typewriter, requires only three keys to be pressed for each word. A top and bottom key bring into position a choice of eight words of the same category. The operator then picks the one word of the eight which he wants by pressing a third key.

Claimed to be adaptable to teletype or typesetting machines, the invention may be extremely important to communication in China. The Mingkwai typewriter now does a day's work by a Chinese copyist in one hour.

Science News Letter, September 6, 1947

TYPES CHINESE—This typwriter looks conventional enough, but it is estimated by its inventor, the author Lin Yutang, to be capable of advancing the progress of China by a decade. It can print 90,000 Chinese characters by pressing three keys for each word.

PHYSICS

New Term Proposed for Study of Atomic Nucleus

➤ SCIENTISTS have discovered so many new facts about the heart of the atom, the nucleus, that a new scientific term is needed, an atomic scientist suggested.

The new word for your atomic vocabulary is "nuclide." Truman P. Kohman of the Institute for Nuclear Studies of the University of Chicago proposes the new term (*American Journal of Physics*, July-August).

Nuclide, he explains, comes from the word nucleus and a Greek word meaning species, sort or kind. Hence, nuclide means a species of nucleus.

One of several members of the proposed nuclide family would be the famous isotopes. But radioelement or radioisotope should now be called radionuclides in most cases, declares the physicist.

A nuclide is defined as a species of atom characterized by the construction of its nucleus, particularly the number of positive electrical units and neutral particles in the nucleus of the atom.

Isotopes, under the new scheme, are nuclides with the same number of positive charges in the nucleus. Thus, they belong to the same element, though they have different atomic weights.

Other atomic nuclides are the isotone, isobar, isodiaphere and isomer. These are all chemical terms classifying atoms by the number of positive electrical units and neutral particles in the nucleus.

Science News Letter, September 6, 1947

VETERINARY MEDICINE

American Dogs Endangered By Yellow Jaundice Spread

➤ DOGS in this country are in serious danger from a highly infectious, often fatal form of yellow jaundice, that has been spreading rapidly during the past ten years, Col. Raymond Randall of Washington, D. C., warned the meeting of the American Veterinary Medical Association. The disease is marked by yellowish skin discoloration, high temperature, depression, loss of appetite, bleeding gums and intestinal trouble.

The cause is a corkscrew-shaped bacterium of the genus *Leptospira*. Strains of the same germ are known to cause jaundice-like diseases in other animals, including rats, mice and man. Some dogs are not made very sick by the disease, but serve as carriers to healthy animals, which sometimes die of it.

When the disease has been definitely diagnosed with the aid of laboratory tests, it should be combated with serum and penicillin, Col. Randall recommended.

Cases of disputed paternity among animals can be decided in much the same way as among human beings, by blood-group tests, Dr. L. C. Ferguson of Ohio State University told the meeting. Blood-grouping may eventually be of practical use in breeding programs, he predicted.

Deer and elk were indicted as immune or resistant carriers of the dreaded liver-fluke disease of cattle and sheep by a committee of the Association under the chairmanship of Dr. W. E. Swales. Stockmen whose range is also used by deer or elk were warned to maintain special vigilance against this disease.

Two medals were awarded to members of the Association. The Twelfth International Veterinary Congress Prize, highest award in veterinary medicine, was presented to Dr. William J. Butler of Helena, Mont., and the Borden award and medal to Dr. Jacob Traum of the University of California.

Science News Letter, September 6, 1947

PHYSIOLOGY

Skin Eruptions Related To Starch Digestion

➤ A BAD complexion may be due to sluggish starch digestion, it appears from studies reported by Drs. Charles W. Bauer and William Francis Martin of Massachusetts College of Pharmacy to the American Pharmaceutical Association in Milwaukee, Wis.

Their studies were made with a chemical in saliva which digests starch, converting it into sugar. The activity of this chemical, which they term salivary amylase, is not the same in all persons. The variation may be considerable.

This chemical from the saliva of 150 persons without skin eruptions took from one to six minutes to digest starch. But that from 79 persons who had skin eruptions varied from one minute to over one hour in digestion time.

More than half, 45, of these persons with skin eruptions had a digestion time of over six minutes.

"It seems possible," the scientists concluded, "that people with skin eruptions may have sluggish salivary amylase."

Science News Letter, September 6, 1947

IN SCIEN

VETERINARY MEDICINE

New Anesthetic Is Safe For Horses and Cattle

➤ A MIXTURE of old-fashioned knockout drops (chloral hydrate), Epsom salt and pentobarbital sodium has had good results as a total anesthetic for horses, bulls and other large animals that need surgical attention but might suddenly send the veterinary himself to the hospital in the midst of the operation. Dr. E. W. Millenbruck of Carthage, Mo., described this new aid to the veterinary surgeon, which he developed jointly with Dr. M. H. Wallinga of Cedar Rapids, Iowa.

The mixture is safe and non-poisonous, said Dr. Millenbruck. It produces a short but complete period of anesthesia, enabling the surgeon to work undisturbed. The animals recover from its effect quickly and without the floundering that might cause them further injury. He stated that he has used it in animal surgery that without it would have been difficult for him and painful to the animals.

Science News Letter, September 6, 1947

NUTRITION

Almond Hulls Indicated As New Syrup Source

➤ SYRUP from almond hulls is a new suggestion for eliminating some of the waste of the world's food products.

Dr. William V. Cruess, food technologist in the University of California College of Agriculture, has determined in new experiments that 100 gallons of good quality table syrup can be made from a ton of dried almond hulls. The hulls have a 25% sugar content.

He estimates that the syrup would cost about twice as much as other syrups, but adds there would probably be a market for it at the present time. Beet-sugar factories might in off-seasons convert the hulls into syrup. Almonds shelled in 1946 left 35,000 tons of shells to be disposed of.

Dr. Cruess and two students, John Kilbuck and Ernest Hahl, have found that almond hulls can also be converted into crude molasses for livestock and used as a source of tannin extract for tanning leather.

Science News Letter, September 6, 1947

E FIELDS

SOCIOLOGY

Rich Children Found Taller and Heavier

➤ RICH CHILDREN of Ottawa, Canada, average an inch taller and three pounds heavier than poor children of the same age.

This difference in development of children of upper and lower economic classes is revealed in a study of more than 5,000 school children made by Dr. J. W. Hopkins, biometrician of the National Research Laboratories in Ottawa and reported to the American journal, *Human Biology*.

The children in the good residential districts were predominantly from families of business, professional and administrative men. The poorer districts included children of artisans, trades-people and government employees of the clerical grade. Both groups were of British ancestry, mostly English and Scotch.

Both rich and poor are larger than similar groups measured 10 years ago. The fact that rich children are larger than poor children confirms the theory that the increase in stature may be due to improved nutrition and environment.

Science News Letter, September 6, 1947

CONSERVATION

Conservation of Coal Urged in England

➤ FORESEEING a possible long-continued shortage of coal in the United Kingdom, scientists at the meeting of the British Association for the Advancement of Science urged conservation through the use of improved combustion methods.

"About one-quarter of the total yearly output of coal is today consumed in old-fashioned and inefficient open grates," Prof. D. M. Newitt of the Imperial College of Science and Technology, London, told the group. "From every point of view, this practice is undesirable, and more refined and efficient methods based upon electricity and gas should be substituted."

In order to make the most efficient use of coal, a knowledge of the different types of coal is essential, A. C. Monkhouse, deputy director of the British Fuel Research Station, Greenwich, told the meeting. Nine coal survey laboratories have been set up in the principal coal fields and the properties of the coals have been determined, he said. The influence of the type of coal and system of combustion on deposits within factory furnaces, methods of smoke prevention, and heat emission from domestic appliances are being studied.

"The domestic fire belongs to an age of abundant coal, cheap labor and carelessness about social amenities," Prof. J. D. Bernal of Birkbeck College, London, declared. "Its efficiency as a generator of heat ranges from five to fifteen per cent, and of the heat which enters the house, most is lost through poor insulation and excessive ventilation. As a result the bulk of the British people keep much less warm and use more of their needed coal than do our cousins in America in far more severe winter climate."

Large economies, he said, can only take place by modifying existing equipment, and research is badly needed into methods of increasing the efficiency of ordinary domestic fires and into providing cheap means of increasing the insulation of houses.

Science News Letter, September 6, 1947

VETERINARY MEDICINE

Dogs May Get Epilepsy, Other Nervous Diseases

➤ DOGS may develop epilepsy, Dr. C. F. Schlotthauer of Mayo Foundation, Rochester, Minn., told members of the American Veterinary Medical Association at their meeting in Cincinnati.

The epilepsy is the kind, which humans also have, which arises without any known cause and is termed idiopathic.

Fits, convulsions and paralysis are the most frequent nervous symptoms seen in dogs, Dr. Schlotthauer stated. They are not specific for any one disease, however, but only indicate where the trouble originates, not its cause.

Viruses probably account for most of the ailments that can be attributed to injury or damage of the brain and spinal cord. Disturbances of blood circulation and tumors, which are common causes of damage in the brain and spinal cord of man, are less frequent in dogs.

Sometimes poisonous substances in the diet or diets lacking in essential vitamins or amino acids may give rise to nervous disorders in dogs.

Science News Letter, September 6, 1947

MENTAL HEALTH

Three-Way Mental Health Program Starts Underway

➤ THREE-WAY national attack on mental health problems is underway with funds appropriated by Congress.

The program calls for increased research, more training of personnel and support and stimulation of state mental health programs.

A total of $3,000,000 of the $7,500,000 appropriated by Congress is slated for grants-in-aid to states for local mental health work. Aim of the project, U. S. Public Health Service officials said, is to establish one out-patient mental health clinic for each 100,000 of the population, plus traveling units for sparsely settled areas.

State grants will be made on the basis of programs and budgets now being received by the Public Health Service, but the mental health clinics will be delayed by the lack of trained personnel.

Part of this problem is being tackled by more than $1,000,000 in grants to institutions. Funds for developing and improving facilities for training urgently-needed mental health personnel have been granted to 17 institutions in the field of psychiatry, 16 in clinical psychology and nine each in psychiatric social work and psychiatric nursing. Financial aid to 209 graduate students in the four fields is also being provided.

Mental health research will be aided by grants of approximately $400,000 in the fiscal year 1948, the Public Health Service reported. Twenty-five research projects and research fellowships are included in the program for studying mental health problems.

A National Institute of Mental Health may be established near the capital.

Science News Letter, September 6, 1947

ASTRONOMY

Dr. Henry Norris Russell Appointed to Harvard

➤ DOCTOR Henry Norris Russell, who served as director of the Princeton University Observatory for 35 years before his retirement on July 1, has been appointed a research associate at the Harvard College Observatory.

Dr. Russell for many years has been a member of the Harvard Overseers Committee to visit the Harvard Observatory and department of astronomy.

Science News Letter, September 6, 1947

HORTICULTURE

Hydroponic Harvest Reaped

Fresh vegetables by the ton are being grown without soil so that soldiers away from home can have tasty rations necessary for health and morale.

By DR. FRANK THONE

See Front Cover

➤ RIPE RED, juicy tomatoes—a thousand tons of them—have been grown by soilless gardening methods in Japan this season so that our occupation troops might have something fresh that "tastes like home." With them have been produced lettuce, cucumbers, green peppers, onions and radishes enough to run the season's total up to about 3,180,000 pounds—really quite a sizable salad bowl.

Elsewhere in our new far-flung outposts there are smaller hydroponic installations raising greenstuffs to maintain the health and morale of our men. There is one such garden at Atkinson Field in British Guiana, one on Iwo Jima, one at Nanking, China. The Atkinson Field unit supplies fresh salad vegetables, via air transport, to two or three other airfields.

Anyone who has ever seen an Army chow-line when the first green vegetable salad was served in one of these far-off places, knows how mythical is the American male's supposed indifference to salads. True, he may not care much for hand-carved confections with whipped cream on top of the mayonnaise and a split cherry on top of that. Such salads, that look more like millinery than food, are "female stuff"—no, thank you! But plenty of crisp leaf lettuce and sliced tomatoes, with enough green-pepper rings and chopped green onions to give it pep, and just salt and pepper, vinegar and oil for dressing—Quit pushin', Joe, there's enough for everybody!

6,000,000 Tomatoes

Really, there is: allowing three good-sized tomatoes to the pound, the 2,000,000 pounds of them raised on the two hydroponic farms in Japan this year figure out as 6,000,000 tomatoes. Those were divided among a force of about 100,000, which averages out as 60 tomatoes per man. Not all you might eat at home, but still enough to get along on.

This ambitious venture into soilless gardening got its start during the war, when it became necessary to maintain good-sized garrisons in places too far for successful refrigerator-ship carriage of greenstuffs and too desert to grow gardens in the soil. In Japan and China they are set up for a different reason. They have soil in those countries, and rain enough; but their traditional methods of fertilization are such as to make eating unboiled vegetables a practically certain invitation to the germs of dysentery and typhoid fever.

Two Principal Types

There are two principal types of hydroponics or soilless gardening: the liquid-culture system, invented in California by Dr. W. F. Gericke; and the gravel-culture system, originated at Purdue University by Dr. R. B. Withrow. Both are based on the idea of supplying the necessary fertilizer salts to plant roots in water solution only, without relying on any soil. They are simply applications on a large scale, for actual food production, of laboratory experiments which many generations of plant physiologists have carried on with glass jars and earthenware pots.

In the Withrow system of gravel culture, which the Army chose for its use, long, shallow concrete troughs three feet wide and about a city block long are laid out on a gentle slope. Each trough is divided into three or four sections, like steps with very wide tread and very shallow risers, to facilitate the flow of the liquid carrying the fertilizer salts from top to bottom. These beds are laid out side by side, usually in sets of ten, with walkways between them for the use of the workers who plant and cultivate the vegetables. The troughs are filled with washed river gravel.

Most of the vegetables are started in seeding nurseries and set out at proper intervals in the gravel. At intervals—48 hours as a rule—the fertilizer solution is pumped into the beds until they are level full. Then they are allowed to drain into a sump at the lower end, where the losses in water and mineral salts are made good before the next irrigation period. The culture solution held in the chinks between the pebbles

HYDROPONIC PRODUCE—Japanese workers sort and pack the lettuce leaves they have carefully picked, one by one, and put them into crates for shipment to garrisons of the U. S. Army's occupation force.

FLOWERS WITHOUT SOIL—In the United States hydroponic methods are usually employed only in greenhouses, for such costly crops as cut flowers.

provides the plants with food materials.

General direction of the hydroponics program has from the beginning been in the hands of an Air Quartermaster officer, Lt. Col. E. W. Elliott. Pioneer establishment was set up in 1945 on Ascension island, almost on the equator, midway between South America and Africa. This island was then a highly important stopping-place for planes on the way to fighting in North Africa and Asia, and a fluctuating population of about 2,000 had to be taken care of. Since Ascension is a truly desert island, every pint of water used there had to be distilled out of the sea, with oil fuel under the boilers. This establishment has since been abandoned but lessons learned there, from both successes and mistakes, have been invaluable elsewhere.

Biggest in Japan

Biggest of soilless set-ups now producing are the hydroponic farms in Japan proper, where Col. Elliott is directly in charge. He has several eminent Japanese plant scientists among his assistants. All the routine work is done by Japanese crews, though all the produce goes to the messes of the American forces. (See *SNL*, Aug. 23).

A total of 80 acres of working soilless gardening surface is divided into two sections. At the village of Otsu near Kyoto there are 25 acres, and at Chofu near Tokyo are 55 acres. Five acres of the latter installation are under glass—claimed to be the largest single greenhouse in the world.

This hydroponic farm has attracted a great deal of attention in Japan. The Japanese scientists are willing to devote intensive attention to it, and graduate students in Japanese universities are glad to work there at gardeners' low wages, because they want to learn the know-how. Stripped down to less than its pre-war size, the Japanese empire is going to be hard put for food, and no possible way of adding to production is being overlooked. With Gen. MacArthur's permission, the installation has been visited by members of the Emperor's immediate family. Less formally, Mrs. MacArthur last spring helped to harvest the first radishes.

Set Closer Together

Vegetables grown by hydroponic method of necessity are set closer together than is normally the case in conventional soil gardens. Cucumbers are trained up trellises, as they are in greenhouses; tomatoes are similarly supported. Most successful of tomatoes thus far tried are one or two varieties bred specially for cultivation in the tropics. Icicle radishes, an old favorite long white variety that can stand a good deal of warm weather without going to seed, have been the best bet so far as this tangy tidbit is concerned.

With lettuce, the hydroponic gardeners played in made-to-order luck. Most kinds of lettuce "bolt," that is, send up a tall stalk and go to seed, as soon as the weather begins to warm up in early summer. To overcome this handicap, plant breeders of the U. S. Department of Agriculture had worked out a complex leaf-lettuce hybrid involving half-a-dozen strains (including even wild lettuce) which was very deliberate about bolting. This they named, appropriately, "Slobolt"; it was just about ready for general release when the Ascension island installation was set up.

At hydroponic gardens lettuce is not harvested by lifting a whole plant at a time, in the customary fashion. To make each plant produce just as long as possible, each leaf is cut off separately, leaving the central stalk. This grows new leaves, which are again harvested in the same manner. As many as four crops of leaves can be gathered before production falls off and the plant has to be pulled up.

Hydroponics has been used to some

Do You Know?

A former *"mystery animal,"* whose simplest name is Meniscotherium, is now better known to scientists, thanks to fossils found in New Mexico; the one-foot-high animal is, perhaps, a "relative and forerunner of monkeys."

The best Chinese *lacquer* is said to be produced on junks lying out at sea so as to avoid dust, and to give it better drying properties which are aided by humidity.

Puffed-cereal *breakfast foods* are now being produced in Chile by a former Chilean diplomat who learned the know-how and bought the needed machinery while on duty in the United States.

The Eocene period in geological time is the "Dawn of the Recent," when *dinosaurs* had become extinct and the earth became overrun with smaller but smarter warm-blooded animals, mammals.

extent by greenhousemen in this country, but principally for cut flowers and other high-revenue crops. It will be interesting to see what will be the effect on American horticulture of the large-scale experience which Army men have been acquiring.

Science News Letter, September 6, 1947

RADIO

New Navigation Receivers

Pilots will receive very high frequency signals to guide them to destination and also give distances and other navigation information.

➤ NEW VERY high frequency navigation receivers for airplanes were revealed by Bendix Radio, Baltimore, in connection with the Bendix Trophy Race from California to Cleveland, Ohio. They are for use with the Civil Aeronautics Administration's very high frequency (VHF) radio ranges now being installed throughout the country.

These new receivers have passed the development stage and will be in production this fall. They are of what is known as the omni-directional navigation type. To use the VHF radio ranges now being established by the CAA, special receivers are necessary. These radio ranges are guide paths which pilots follow to take them safely along their skyways. The new CAA radio ranges are known as omni-directional ranges, ODR for short. VHF is replacing the ordinary radio waves, the "beams" which pilots have followed in the past, because VHF is static-free.

The ODR is expected to decrease errors in navigation, and to give the pilot visual indication on his instrument panel of complete navigational information. Direction to the station will always be known, distances will also be given by an allied installation.

The new Bendix VHF omni-directional range navigational devices are designed to permit maximum use of the new ODR radio facilities. The receiver is a crystal-controlled superheterodyne which will tune to any channel used in the ODR. By means of its monitor system, crystal-controlled operation on 280 channels is possible with 21 built-in crystals.

In connection with the CAA's omni-directional system an instrument for measuring angles is employed. It is called a goniometer, and a special type is being made by the Bendix company.

With this device a portion of the radio frequency energy from the transmitter is fed through it to the antenna, the rest going directly to the antenna system. It is this combination of energy in the antenna system that produces the effective 360-degree rotation of the VHF beam which results in the variable phase signal at the receiver in the airplane.

Science News Letter, September 6, 1947

Grow Plants In Your Home

SOILLESS GARDENING

With this garden-in-a-box you can have a little "farm" of the most modern sort. And you can have it at any time of the year, regardless of weather.

This kit has been assembled for you so that you can experiment in a practical way with some of the latest developments in soilless gardening, hydroponics, or tray agriculture, as it is variously called.

You will have fun raising the plants and doing the suggested botanical experiments. That is the reason that the kit is called: Science FUNdamentals.

Anyone can learn about growing things and some of the principles of agricultural science by experimenting with this kit. The plants you raise will not lower the high cost of living but they will increase the pleasure of learning. Send for this kit today so you can get started on soilless gardening as a hobby.

$4.95 delivered anywhere in U. S. A. **postpaid**

CONTENTS OF KIT

One dozen Green Pots
(that you can assemble)

Cellophane sheets
(of various colors - to be used in light and growth experiments)

Chemicals Your Plants Will Need
3 vials - Potassium acid phosphate
2 vials - Magnesium sulfate
1 vial - Calcium nitrate
1 vial - Ferrous sulfate

Seven Kinds of Interesting Seeds
Russian sunflower
Earliana tomato
Globe radish
Dwarf nasturtium
Okra
Soya bean
Ornamental gourds

Box of Vermiculite
(shiny stuff that serves as soil but isn't really)

Plant Breeding Material
1 vial - Hormodin
1 vial - Seedless Fruit Hormone

Instruction Book

All packed in colorful wooden box

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SNL 9-6

SOIL CONSERVATION

NATURE RAMBLINGS

by Frank Thone

Sold Down the River

➤RECENTLY New York papers carried news items about the destructive operations of "topsoil strippers" on Long Island. If you have an estate that lacks good soil and still want a garden, these vendors will buy fertile topsoil off a farmer's fields or from the owner of unused land, and truck it over to your place. The price paid is good, and everybody should be satisfied.

But everybody isn't satisfied. When a man sells his topsoil he is marketing some of his neighbors' rights as well: the right to live in dust-free country air; the right to freedom from weed seeds, drifting in from land left fallow; the right to assurance that the property next to yours won't become a gullied rural slum, dragging down the value of your own land with it. So the neighbors have been protesting, and several communities have legislated against this particular abuse.

This indignation at landowners' reckless selling of their own birthrights, together with the collateral rights of others, is praiseworthy and an evidence of Americans' ability to take effective community action when they plainly see that community interests are threatened. It would be immensely more cheering, however, if the country at large could be similarly aroused to action over the less spectacularly evident but vastly more damaging loss of topsoil through erosion resulting from bad farming, pasturing and lumbering methods.

The Long Island traffic in topsoil does not result in a total net loss—at least not immediately. The soil carted away is dumped and smoothed out and made into gardens somewhere else. But the soil that is permitted to wash down the silt-choked rivers, or to drift down the wind in dust-storms, finds no new abiding place, except as stinking mud left when flood-waters recede or as thick layers of gritty stuff after the dark wind dies down.

Despite some slight improvements following years of effort by such missionaries of science as H. H. Bennett and W. C. Lowdermilk, wholesale abuse of our land still goes on. Millions of Americans still sell our common birthright down the river, not even for a mess of pottage and the doubtful blessing of a blind patriarch; they sell it only for the eventual curses of generations yet unborn.

Science News Letter, September 6, 1947

ASTRONOMY

No Heat Waves Exist On the Other Planets

➤ THAT hot-weather bore who tells you he always slept under two blankets in the vacationland he's just got back from might be a good candidate for the first rocket-trip to Mars—preferably on a one-way ticket. Midday temperatures there get up to about 50 degrees Fahrenheit, it begins to freeze at sunset, and before morning the thermometer would read 50 below. Or you might even want to send him out to Jupiter or Saturn, where it never gets warmer than 216 degrees below zero.

Inhospitability of other known planets to life as we know it was brought out in detail in a talk by Rev. F. J. Heyden, S.J., director of the astronomical observatory at Georgetown University. Father Heyden spoke as the guest of Watson Davis, director of Science Service, on Adventures in Science, over the Columbia Broadcasting System.

There are other reasons, too, why human beings would never choose other planets as summer resorts. Mars, for example, might supply lots of sand, but probably couldn't offer much in the way of beaches. For long-range studies of our nearest planetary neighbor's atmosphere show that it has only about one-twentieth as much water vapor as the earth's. The whole atmosphere, as a matter of fact, is much thinner than ours, and the surface of the planet is largely a red desert.

Venus, circling the sun just inside the earth's orbit, has a much denser atmosphere and apparently a continuous canopy of cloud. But as nearly as can be determined, the atmosphere consists almost entirely of carbon dioxide, and the clouds are made of droplets of liquid formaldehyde. There is no water, no free oxygen.

Closest to the sun, Mercury has no atmosphere at all. The same side of this smallest of the planets is always turned towards the sun, so that it is certainly a seared and blistered cinder, while the side that is always in shadow has a temperature close to that of dry-ice, or solid carbon dioxide.

The giant planets Jupiter and Saturn, in the suburbs of the solar system, are not only always terribly cold because of their great distance from the sun; their atmospheres appear to consist mainly of ammonia vapor and methane or marsh-gas.

For these and other reasons, Father Heyden concluded, the only legitimate places for inhabitants of other planets are "in fairy tales, adventure stories and comic books."

Science News Letter, September 6, 1947

Principal *food* of natives in the high Andes consists of potatoes, both wild and cultivated.

Books of the Week

TO SERVE YOU: To get these books, send us a check or money order to cover retail price. For free publications send 10 cents to cover handling. Address Book Dept., SCIENCE NEWS LETTER, *1719 N St., N. W., Washington 6, D. C.*

CHIPPEWA VILLAGE: The Story of Katikitegon—W. Vernon Kinietz—*Cranbrook Inst. of Science,* Bulletin 25, 259 p., illus., $3. A contrast of new and old, being a story of life in this conservative community along the Michigan-Wisconsin border where life differs from that of a Chippewa village of the past but is not identical with that of their non-Indian neighbors.

DIRECTORY OF ASTRONOMICAL OBSERVATORIES IN THE UNITED STATES—Mabel Sterns—*J. W. Edwards,* 162 p., illus., paper, $2.85. This directory lists the astronomical observatories in the U. S., giving name, location, ownership, and description. It is divided into two sections: observatories other than those of astronomical societies and those of astronomical societies.

ENGLISH-SPANISH CHEMICAL AND MEDICAL DICTIONARY — Morris Goldberg — *McGraw-Hill,* 692 p., $10. Translations and definitions in Spanish of more than 40,000 of the most important terms of medicine, surgery, pharmacy, chemistry, dentistry, veterinary biochemistry, bacteriology and related sciences.

PROCEEDINGS OF THE AMERICAN SOCIETY OF SUGAR BEET TECHNOLOGISTS—*publ. by the Society,* 684 p., illus., $5. This contains the proceedings of the Fourth General Meeting held in 1946 which comprise numerous technical papers on all phases of sugar beet production and sugar production from sugar beets.

PROCEEDINGS OF THE RESEARCH FORUM AT ENDICOTT, N. Y., AUGUST 1946—*Int. Business Machines Corp.,* 94 p., paper, free. A collection of papers read at the forum for the purpose of informing those persons interested in machine methods of psychological research and statistical procedures to learn of the techniques developed during the war years.

THE SANTA FE TRAIL: The Opening of the West—Editors of LOOK—*Random House,* 271 p., illus., $3.50. Focused on the Santa Fe Trail, this pictorial history of one phase of the opening of the West emphasizes the courage and endurance necessary for survival during a picturesque period in American history.

THIRTIETH ANNUAL REPORT OF THE NATIONAL RESEARCH COUNCIL OF CANADA 1946-47—*publ. by the Council,* 27 p., paper, free. A general indication of the work of the National Research Council, the nature and variety of the hundreds of projects under investigation in the several divisions.

Science News Letter, September 6, 1947

MEDICINE

New Policy on Insurance Needed for Syphilitics

➤ A NEW policy for deciding whether a person with syphilis should be accepted or rejected for life and disability insurance is needed, Drs. Joseph Earle Moore of Baltimore and Ira Leo Schamberg of Philadelphia declare. (*Journal, American Medical Association,* Aug. 30)

Penicillin and other modern methods of treating syphilis, plus recent reports on mortality from syphilis, are among factors which make a new policy on insurability of syphilitics necessary.

At the request of the Veterans Association, the two physicians have prepared suggestions for revision of policy which will be of equal interest to commercial life insurance companies.

No applicant with untreated syphilis in any stage should be granted insurance if, as with commercial companies, the applicant must demonstrate good health. If treatment has been given it should have been adequate.

An applicant can be accepted for both disability and life insurance if he has been treated within two years of getting syphilis and tests of blood and spinal fluid were negative for two or more years after treatment.

Suggestions to accept or reject applicants are based on the type of syphilis and the treatment and results of it in the individual applicant.

When the disease has attacked either the liver, stomach, heart, blood vessels or, in certain cases, the central nervous system, the recommendations are to reject the applicant for both life and disability insurance.

The recommendations are based on various facts now known about syphilis and its treatment, among them the following:

Acquired syphilis is a chronic disease which seldom if ever kills within the first two years after it is acquired.

At least 95% of all deaths from acquired syphilis are due to one or a combination of three causes: 1. syphilis of the heart and blood vessels; 2. syphilis of the central nervous system; 3. hazards of treatment with metals (arsenic) and fever.

The probability of eventual development of syphilis of the central nervous system, in the form of paresis or locomotor ataxia, for example, can be fairly accurately predicted any time after the second year of infection by routine examination of the spinal fluid. The probability of syphilis of heart and blood vessels, however, can not be accurately predicted in the early days of the infection.

Untreated acquired syphilis is not necessarily a fatal or even a serious disease. In at least 50% there is no apparent effect on individual health. In only about 25%, potentially fatal late forms of the disease develop.

Science News Letter, September 6, 1947

Sheep are rapidly and effectively sprayed in a sheep tick control program by driving them through a rectangle of pipes lined with nozzles which shoot spray on them from the top, bottom and both sides.

• New Machines And Gadgets •

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., Washington 6, D. C. and ask for Gadget Bulletin 378. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

❁ *ALUMINUM LININGS for household skillets and baking pans are discarded after a single use and save the drudgery of scouring out the used utensil. The shaped linings, made in sizes to fit standard skillets, are of non-absorbent, non-inflammable, highly burnished aluminum foil.*

Science News Letter, September 6, 1947

❁ *SAMPLE COLLECTOR is a vacuum device with a suction hose that draws ore cuttings out of a hole being drilled into the earth while the drill is in operation. It is a U. S. Bureau of Mines device, and is used with the ordinary drill wagon employed in mineral exploration.*

Science News Letter, September 6, 1947

❁ *WATER SOFTENER, for home use, consists of a two-foot high plastic tank piped into the water line and through which the water passes. Within is a synthetic mineral filter which removes from the water the mineral salts that cause hardness. The plastic is tasteless.*

Science News Letter, September 6, 1947

❁ *JACK for forcing warped boards into tight-fitting position in floors or sidewalls has an anchor head that may be fixed to a joist or stud with a tap of a hammer, and lever action to squeeze the boards together and hold them for nailing. It can be used also to align bent joists.*

Science News Letter, September 6, 1947

❁ *MICROPHONE-TRANSMITTER, containing its own electric power, sends speech through the air to radio receivers up to 75 feet away. It utilizes a radio frequency oscillator modulated within the microphone. The portable "mike" can be placed wherever wanted, and used for intra-plant communication or home entertainment.*

Science News Letter, September 6, 1947

❁ *TELEVISION KIT, for final assembly in the home by the purchaser, contains all the component parts except tubes. Instructions for assembly accompany the kit. It is in two sizes, a seven-inch and a ten-inch telekit, both at a reasonable cost.*

Science News Letter, September 6, 1947

❁ *MAGIC LASSO, which anyone can quickly learn to spin, is "safe" in the hands of children and will satisfy the longings of those who have seen the lasso spun in movies or circus. It is a hand-finished sisal rope, fitted with a tiny embedded swivel to permit free spinning of the loop.*

Science News Letter, September 6, 1947

❁ *HOME SHOP power tool has attachments that permit it to be used either as a circular saw or a jigsaw, and also for sanding, grinding, buffing and shaping. It has a rugged cast-iron base, steel drive with ball bearings, and a removable saw table of aluminum.*

Science News Letter, September 6, 1947

Question Box

AERONAUTICS

How fast can an airplane go? p. 146.

ASTRONOMY

Where are there no heat waves? p. 158.

BIOLOGY

What is aerosporin? p. 151.

HORTICULTURE

Where are fresh vegetables being grown by the ton without soil? p. 154.

METALLURGY

How high a temperature is reached in a gas turbine engine? p. 151.

NUCLEAR PHYSICS

How does the new atomic pile differ from the older one? p. 147.

PHOTOGRAPHY

Are pictures in 3 dimensions possible without viewing gadgets? p. 150.

How can pictures be taken at four hundred-millionths of a second? p. 150.

PHYSICS

Is it possible for a human to go 100 miles up? p. 146.

PHYSIOLOGY-GENETICS

What agencies will study the effects of atom bomb radiation? p. 148.

PUBLIC HEALTH

Where is DDT being tested as a weapon against infantile paralysis? p. 149.

SOCIOLOGY

What advantage do rich children have over the poor? p. 153.

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