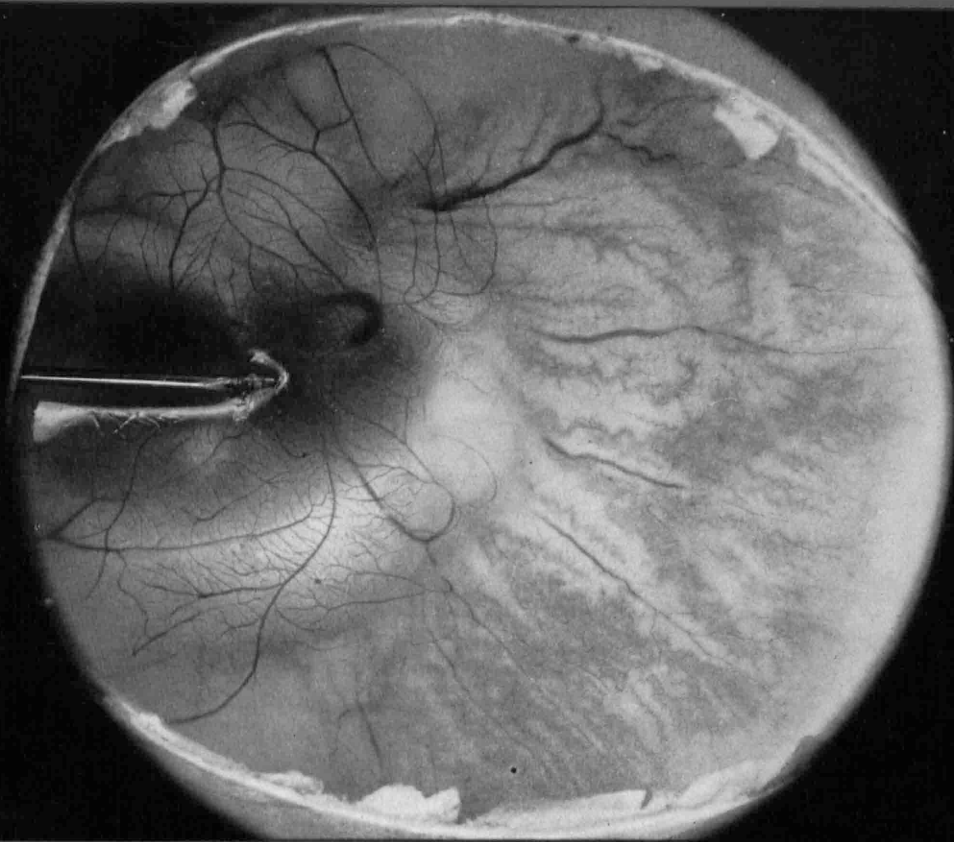


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APRIL 15, 1950

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



An Egg With 'Flu

See Page 236

A SCIENCE SERVICE PUBLICATION

\$5.50 A YEAR

VOL. 57 NO. 15 PAGES 225-240

METALLURGY

From Now On: Elements

Reign of iron, steel, tin, lead, zinc and copper is nearing end. The bright new metallic world of future will grow from strange new elements.

By WATSON DAVIS

Third of a series of glances forward in science.

► IT is well past half-past the age of iron. There will still be steel, that alloy of iron, a hundred years from now.

But the future supremacy of iron (and steel) is challenged by the relative exhaustion of the bonanzas of that element whose symbol is Fe. Don't sell your steel stock, but keep your eye, too, on other metals, whose names you may not now be able to spell.

For tin, lead, zinc and copper are old and about played out, too, speaking for the decades to come. That bright, new metallic world to come will have to be built of different stuff, strange materials, unusual in their look, feel and action, harder to extract from the earth that oftentimes hides their plenty.

Not just the light aluminum, wonder metal of last century's close, which snatched from bauxite by electrochemical artifice, gave bodies to the birds of war. Not even magnesium, lighter still, which chemically fished from seawater, teams up with aluminum as a new structural material.

There are new metals that are today industrial curiosities. Such metals include titanium and molybdenum, that most people have never seen in metallic form. They are great alloying helpmates to steel in making the jet engines and turbines that have to withstand high heats. They are very plentiful metals, except for the trouble of getting them out of their ores, which is being overcome.

Titanium is the tenth most abundant element on earth, outranked in nature's stockpile only by aluminum (No. 3), iron (No. 4), and magnesium (No. 8) among the stable useful metals. Over a quarter of the earth is silicon. Very reactive calcium, sodium and potassium, metals that don't like to be alone, are also in the first ten. They are not rare, except in the metallic form.

Zirconium is a sister metal to titanium, highly resistant to many acids, and promising as a structural material for atomic power plants. Tantalum is scarcer than gold, but has a higher melting point than molybdenum and is so chemically resistant that it doubles for human bone in surgery.

To the future of electronics, silicon and germanium are bringing new wonders, when they are put into electrical conditions of various sorts. To the art of communication and power, they promise new devel-

opments—cinderella metals that will not go back to obscurity.

There is a whole family of metals, only one of which is in almost every smoker's pocket, in the cerium oxide of the "flint" of cigarette lighters. Cerium is the first of the lanthanide series of the periodic table, so-called because they follow lanthanum in the table. The others are: praseodymium; neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium and lutetium. What new wonders for a new metallic age might be found in these neglected "rare earths"?

GENETICS

Chemical Heredity Carrier

► HEREDITY is a matter of chemistry, it appears from a discovery by Prof. Arthur W. Pollister of Columbia University in New York.

It is a chemical substance within the single cell which probably acts as the carrier of the hereditary units known as genes, Prof. Pollister finds.

This chemical is desoxyphenose nucleic acid, or DNA for short. Using a complex machine for photometric chemical analysis, Prof. Pollister was able to determine the relative concentrations of DNA and other substances in the nucleus of a single cell. Within this structure of a few ten-thousandths of an inch, it can be shown that the amount of DNA is less than one-trillionth of an ounce.

The genes are located in the chromosomes of the cell nucleus. Nearly every cell of the body contains at least a double set of chromosomes and a double set of genes. This double set is present because at the fertilization of the egg, two sets of chromosomes and genes were brought together, one from each parent.

"By direct photometric analyses at the University's laboratories," Dr. Pollister declared, "it has been shown that DNA alone is strictly parallel in amount with the number of sets of chromosomes and genes.

"When analyzed, the very common double-chromosome nuclei of such cells as blood, liver, brain, kidney and glands, have all proved to have the same amount of DNA."

The single-chromosome nuclei of the sex cells, as expected, were found to have just one-half as much DNA. And, as often

There is beryllium, more plentiful as an element than tin, that gives promise of alloying usefulness. And the list is longer, these elements ending in -ium, each perhaps with a property that may bring it to uniqueness in the future of science and industry.

We need to explore our world of metals intensively, with long, bold leaps into the morass of the hopeful perhaps!

A. Research for new methods of unlocking metals from their ores, especially the more promising and more plentiful ones.

B. Discover, especially, ways of economical extraction of aluminum from clay, and titanium from its plentiful mother minerals.

C. Establish a lanthanide institute or foundation to penetrate the untouched area of those rare earths and make them fruitful.

D. Study the conservation and better utilization of the remaining stores of our common metals (iron, copper, zinc, tin, lead), not forgetting that our profligate civilization has metallic deposits in its scrap-heaps.

Science News Letter, April 15, 1950

happens in science as well as other fields, the exceptions eventually helped to prove the rule: the "giant" four-chromosome nuclei, and the still rarer "super-giant" eight-chromosome nuclei turned out to have four and eight times as much DNA as the single-chromosome sex cells.

The experiments served to clear up an international disagreement over DNA, Dr. Pollister stated. Previously, French biochemists, by comparing their analyses of DNA in masses of nuclei with the number of billions of nuclei estimated to be in the mass, found indications that the amount of DNA per nucleus might be constant, and about double that of the male sex cells. An American laboratory got results which did not agree with the French claims.

The direct measurements made on single cells in the Columbia laboratories clear up the dispute, Dr. Pollister asserted. They prove conclusively that the French tests are correct, and at the same time offer, in the analysis of the "giant" nuclei, an explanation of the disagreement that existed, he said.

The project also revealed that cells may grow to eight times their usual size without any increase in the amount of DNA; that cancer cells contain the same amount of DNA as normal cells; and that human blood-forming cells always contain exactly the same kind and amount of DNA whether the cells are from infants, youths, or adults from persons with extreme anemia, or from those who are recovering from anemia as the result of treatment with vitamin B-12.

Science News Letter, April 15, 1950

MEDICINE

Cure for CO Victims

Novocaine, the anesthetic used by dentists before extraction and drilling, is injected into veins to treat persons suffering from carbon monoxide poisoning.

THE anesthetic dentists use before tooth pulling or painful drillings turns out to be good medicine for victims of carbon monoxide gas poisoning.

Injected into the veins, this chemical brought rapid recovery to 17 of 23 patients, Drs. Edwin W. Amyes, John W. Ray and Norman W. Brockman of Los Angeles report in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (April 8).

The anesthetic is procaine hydrochloride, known popularly under the brand name, novocaine.

The patients to whom it was given had been brought to the Los Angeles County Hospital from one and one-half hours to six weeks after exposure to carbon monoxide.

Although they had not died of the poisoning, they were suffering from the effects of the gas on nervous system and brain. In some cases, the condition had at first been wrongly diagnosed as the serious mental disease, schizophrenia, and as hysteria, food poisoning, epilepsy, brain injury and fainting.

These wrong diagnoses were made from the symptoms before the history of carbon

monoxide poisoning was obtained. This suggests, the Los Angeles doctors point out, that many cases of anoxia, or oxygen lack, due to inhalation of carbon monoxide, go unrecognized and that there are more cases of this poisoning than is realized.

Carbon monoxide kills, or brings sickness and damage, because it deprives the body of oxygen. It does this by replacing the oxygen in the hemoglobin of the blood. Carbon monoxide has an affinity for hemoglobin that is over 200 times that of oxygen.

In the 23 patients given procaine hydrochloride, abnormal amounts of the carbon monoxide-hemoglobin combination were present in only two.

The six patients who did not recover following procaine hydrochloride were treated long after exposure to carbon monoxide or had serious complications.

Use of this treatment was suggested by Dr. C. W. Olsen of the attending staff of Los Angeles County Hospital. "Startling improvement" in a few cases under this treatment had previously been reported by Drs. L. Justin-Besancon and C. Laroche in a report to a hospital medical society of Paris, France.

Science News Letter, April 15, 1950

R. Clarkson. This country's rigid quarantine on the Mexican border will remain in full effect until it can be determined there is no more aftosa in Mexico, he said. "And that's going to take a lot of determining," he added.

The Senate Agriculture and Forest subcommittee on foot-and-mouth disease reported:

"A period of one-and-a-half to two-and-a-half years will be required before any one can safely say that foot-and-mouth disease has been eradicated in Mexico. If it is, certainly a new achievement will be registered in history."

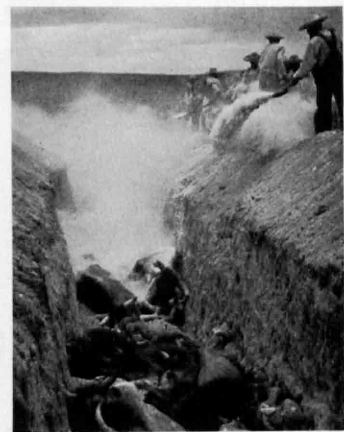
Science News Letter, April 15, 1950

AGRICULTURE

Pasteurized Vegetables for U. S. Troops in Japan

U. S. occupation troops in Japan will be the first to benefit by science's newest wrinkle—fruits and vegetables pasteurized like milk. The pasteurized vegetables are safe to eat because the typhoid, dysentery and other disease germs that might have been on them have been killed.

Researchers at Rutgers University's New Jersey Agricultural Experiment Station have worked it out for the Army Quartermaster Corps. The Army said they have found proper pasteurization kills all undesirable



DOWN WITH DISEASE—Animals condemned to death as probable carriers of foot-and-mouth disease are driven into the pits and shot. The hides are then slashed, and the carcasses are sprinkled well with lime to hasten decomposition and prevent illegal salvage which might spread the disease. This method used to battle the spread of foot-and-mouth disease has been supplanted by vaccination.

VETERINARY MEDICINE

Crisis in Aftosa Battle

ONE of the most desperate scientific battles on the North American continent will be won or lost this year.

For three years, U. S. cattlemen have been sitting on a powder keg—the chance that Mexico's virulent foot-and-mouth disease might hop the Rio Grande.

If it hit American herds, "aftosa" as the Mexicans call it would almost certainly disrupt the nation's entire livestock industry. To forestall that possibility, Uncle Sam has spent more than \$110,000,000, sent 900 Americans under Maj. Gen. Harry H. Johnson into Mexico to help fight the disease.

Nearly a million Mexican cloven-hoofed animals—cattle, hogs, sheep and goats—were slaughtered in the first year of the U. S.-Mexican program. Then increasingly violent resistance from uncomprehending peons forced Mexico to call a halt to "rifle sanitario"—massacre and deep-burial of all exposed animals.

Aftosa Commission scientists turned to an unprecedented attempt. By developing a new serum, stringing barbed wire across a 205,000-square-mile quarantine belt, and

rigid inspection practices, they have been trying to wipe out the disease by immunization rather than the blood bath.

Now, report both the Department of Agriculture and a Senate subcommittee, the critical period has been reached. By May, nearly 15,000,000 animals in the quarantine belt will have had four vaccinations of aftosa serum.

The vital question, as mass vaccinations cease: Will immunization last long enough for the virus to be stamped out in the isolated areas where it does break through? Rigid inspection schedules will be stepped up as vaccinations taper off over the summer.

"There hasn't been a new outbreak since December," said Dr. M. S. Shahan, director of foot-and-mouth disease research in the Bureau of Animal Industry. "The situation looks promising. But that's as far as we can go. No one can say the disease has been wiped out."

A long period of "watchful waiting" is required, said the chief of the Bureau's inspection and quarantine division, Dr. M.

bacteria and other organisms found on food grown in contaminated soil. Yet it does not affect the quality of fresh foods.

Tomatoes, lettuce, spinach, and carrots may be heat-treated at 140 degrees Fahrenheit for varying lengths of time. Organisms which cause dysentery and similar parasitic diseases come out cooked. The food stays fresh.

In Asia, as in Africa during World War II, the Army has to ban native produce to be eaten raw because it is often fertilized with night soil. Washing or spraying with

germicides will not remove enough of the bacteria. Native populations are largely immune to such contamination, the Army found, but not American stomachs.

Now GIs abroad may get as many salads and fresh fruits as they want, after pasteurization of native produce. The technique is being developed under direction of Dr. Willem Rudolfs, sanitation professor at Rutgers, and Dr. Warren Stubblebine of the Quartermaster Corps' research and development branch.

Science News Letter, April 15, 1950

ASTRONOMY

Space Ships No Fantasy

► "SPACE navigation is no longer in the realm of science fantasy, but space ships will probably be guided from the earth," astronomer Ernest G. Reuning, of the U. S. Naval Observatory, stated in Washington.

This is because the mathematical calculations involved for space ships to arrive at the right point at the right time would probably require electronic calculators on earth to do the job, he explained.

The problem of space ship navigation can be compared to that of a high-speed motorboat trying to travel to a certain lighthouse, if all the marks normally used for navigation were moving at high speeds and the lighthouse were also moving at high speed, he said.

The equipment required for calculating the course necessary to hit the moving lighthouse-god would be too cumbersome for the motorboat. Likewise, for space navigation, the calculating equipment would be too complicated to be carried aboard a space ship, Mr. Reuning stated.

He suggested that the more logical solution to this problem would be to use ultra-short wave for communication with the earth. Course changes of the space ship then would be made in accordance with

directions received from the earth-bound giant brains. Science fiction writers often suggest that this can be done by giving an "extra puff of energy to the starboard rocket."

Atomic energy propulsion as now known would require such a tremendous amount of shielding for protection that the first space ships, if man is aboard, will probably be rocket-propelled, Mr. Reuning stated. He described the severe damage that could be done to a space ship by a hit from a meteor. He also warned against the possible dangerous effects of powerful radiations from the sun beyond the protective wrapping of the earth's atmosphere.

Science News Letter, April 15, 1950

GENERAL SCIENCE

Who Has "Sensitive" Job? Conferees to Ponder

► THE question of what is "sensitive" and what is not is plaguing at least five members of the House of Representatives on their spring vacation. They are members of the Senate-House conference committee on the National Science Foundation bill which has broken off meetings until April

19, after the spring recess.

The legislators are trying to write a substitute for a House-written amendment to the bill which would require the FBI to investigate and evaluate the loyalty of all Foundation employees and scholarship holders. They recognize the need for investigation of persons who will be in sensitive projects—but they do not know who is to judge what is sensitive and what is not.

Scientists generally, who have been working for less drastic loyalty restrictions in the bill, are pleased over the delay.

Science News Letter, April 15, 1950

SCIENCE NEWS LETTER

VOL. 57

APRIL 15, 1950

No. 15

51,600 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. 57th St., N. W., Washington 6, D. C., North 2255. Edited by RAYMOND DAVIS.

Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00; 3 yrs., \$14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change, please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago, STAtE 4439.

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Question Box

ASTRONOMY

Why will space ships be guided from the earth? p. 228.

ENGINEERING

How can one escape radio commercials? p. 230.

GENERAL SCIENCE

Why is WORLDS IN COLLISION arousing so much controversy? p. 229.

MEDICINE

What is the remedy now being used for victims of carbon monoxide poisoning? p. 227.

Photographs: Cover, U. S. Public Health Service; p. 227, U. S. Department of Agriculture; p. 229, Dr. Donald R. Griffin; p. 230, Dr. I. Clyde Cornog; p. 231, U. S. Fish and Wildlife Service; p. 234, 235, American Museum of Natural History; p. 240, RCA Victor.

METALLURGY

What are the next steps needed in exploring the world of metals? p. 226.

PHYSICS

What is the practical application for the study of bats' cries? p. 229.

PUBLIC HEALTH

What is the natural barrier against plague between U. S. and Mexico? p. 231.

VETERINARY MEDICINE

Against what disease is a battle being waged in Mexico? p. 227.

GENERAL SCIENCE

Book Arouses Controversy

Velikovsky's book challenges the present concepts of various sciences. Author urges readers to decide whether book is science or science fiction.

► A BOOK which may excite almost as much controversy as did the Scopes "monkey" trials of 25 years ago has recently come out. It is *WORLDS IN COLLISION* by Dr. Immanuel Velikovsky.

Based on 10 years reading of the legends and myths of the world of 3,500 years ago, it challenges the present concepts and laws of history, astronomy, biology, geology and theology. In the book, the author says that the reader is urged to judge whether this is science or science fiction.

The tale he presents as science is that the planet Venus was not a planet in 1500 B.C., that it was a comet which came close to the earth—so close that it made the waters of the Red Sea part so the Israelites could pass through, that it created mile-high tidal waves, that it created mountains.

With the help of Mars, Dr. Velikovsky claims, Venus finally became a planet and settled in its present orbit. But the world was visited with catastrophe between 1500 B.C. and 687 B.C. Most men did not really remember this because they were projected into a state of shock by what the Vienna-trained psychoanalyst calls "collective amnesia."

It is from the records of those who, says Dr. Velikovsky, escaped this collective amnesia that he constructs his theories of the solar system, his disagreements with the laws of gravitation and of evolution.

The book might have received very little attention except that it has received widespread publicity prior to its publication. Articles about it and excerpts from it have appeared in *HARPERS MAGAZINE*, *THE READERS DIGEST*, *COLLIER'S* and *THIS WEEK*. The book is being published by Macmillan, one of the nation's leading publishing houses.

However, attempts by scientists and historians to answer Dr. Velikovsky's blanket theories on the basis of the magazine articles have been met with the author's statement that they could not really judge what he has to say until the book was out.

Now the book is out. It is not expected that its publication will modify the opinions of scientists about Dr. Velikovsky's theories as reported by Science Service earlier. At that time, one of the nation's leading astronomers, Dr. Harlow Shapley, director of the Harvard Observatory, speaking for his fellow astronomers, termed the astronomical parts of the Velikovskian theory "rubbish and nonsense."

Geologists know that they can demonstrate that the mountains which Dr. Velikovsky says were formed only 1,500 years before Christ actually are hundreds of mil-

lions of years old. Dr. David DeLo, executive director of the American Geological Institute, declared that Dr. Velikovsky "appears to be bypassing all the sound, scientific observation of a multitude of geologists made during the past 100 years."

Scientists see in the publication of this book a well-publicized attack upon the knowledge that they have built up over hundreds of years by the slow process of experimentation and thought. They see

WORLDS IN COLLISION as a part of the retreat from scientific progress, a part of the fear of what science has wrought. They may be expected to marshal their knowledge and their brains in an assault upon what they consider a distortion of knowledge and history.

Already a biting review has been published in the *NEW YORK TIMES*. Another is expected when Dr. Edward U. Condon, director of the National Bureau of Standards, reviews the book in *THE NEW REPUBLIC*. Others will follow.

Scientists are awaiting the reaction of the people at large to Dr. Velikovsky's theories. They hope the people will follow Dr. Velikovsky's advice to judge whether *WORLDS IN COLLISION* is science or science fiction. And they are confident the people will decide that this is a book of science fiction.

Science News Letter, April 15, 1950

PHYSICS

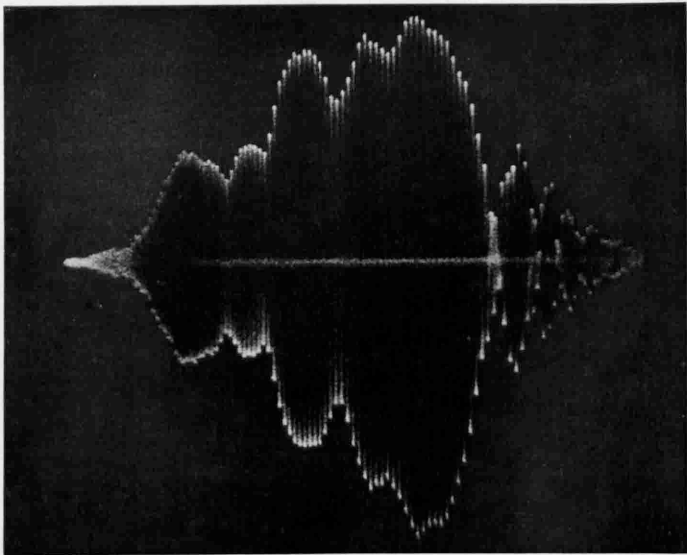
Bats' Cries Like Radar

► THE special cries that bats send out to search out unseen objects in their paths are similar to the radar and sonar systems humans use.

Study of these cries that humans cannot hear may lead to possible devices for blind men to "see" with their ears. A detailed analysis of the bat's cries is reported by Dr.

Donald R. Griffin in the *JOURNAL OF THE ACOUSTICAL SOCIETY OF AMERICA* in Washington (March).

The sound is given out in pulses lasting only about two milliseconds. A millisecond is 1/1000 of a second. The bats may repeat their cries as often as 50 times per second, but there is a relatively long, silent period



CRY OF THE BAT—A typical ultrasonic pulse from a bat obtained with a microphone about ten cm. from the animal's mouth. The sweep velocity is such that the individual waves can just be resolved by the separate bright spots where the electron beam slowed at the peak of each wave.

during which the bat listens for echoes.

Dr. Griffin found that the frequency of the sound varies during each pulse-like cry. A typical cry starts at about 80 kilocycles per second and drops to about 40 kilocycles at the end of the brief burst of sound. Therefore no single frequency can properly be assigned to the cry.

The sound pressures that are developed during the bat's cry are surprisingly high, Dr. Griffin reports. A microphone placed about four inches in front of a bat's mouth will often record sound pressures of 109 decibels.

Normal speech is about 60 to 70 decibels, and a jump of 40 decibels means an increase 100 times in the intensity of the sound. A sound level of 100 decibels is characteristic of the cabin of a noisy combat airplane, Dr. Griffin states.

The bat produces this sound intensity with a specialized larynx or voice-box only one-fifth of an inch in its largest dimension. Ordinarily, one notices no sound as a bat flies past emitting these special cries, but in a very quiet room a faint click may be audible.

Science News Letter, April 15, 1950

ENGINEERING

New Spinning Machine Produces Rayon Faster

► A NEW rayon spinning and processing machine recently revealed accomplishes in three and a half minutes a process that takes from four to five days by the customary method.

The inventor is Harry A. Kuljian, Philadelphia engineer. Formerly an employee of the American Viscose Corporation, he established a laboratory of his own in 1930 and since then has played a leading role in the development of new processes in the rayon industry.

The machine employs a new principle for manufacturing continuous filament synthetic yarn for apparel textiles. It is claimed to produce superior yarn at lower cost and to require less capital investment and to require less plant space. From the moment the thread leaves the acid bath and the spinning process starts on it, no human hand touches it until the finished package of yarn is removed.

Science News Letter, April 15, 1950

AERONAUTICS

Skyjeep Is Adaptable For Many Purposes

► ENGLAND is now producing a "Skyjeep" which, because also versatile, takes its name from the well-known Army jeep. It is an all-metal light plane, now completing flying tests, and ready for its certificate of airworthiness.

The Skyjeep carries a pilot and three passengers. It has a baggage compartment, which normally carries 100 pounds of lug-

gage, that can be quickly fitted with temporary seats for carrying two children. Ambulance work is one of its adaptable roles. The top decking of the rear fuselage lifts up to provide easy loading facilities for a stretcher.

A notable feature of this 2,550-pound plane, which is powered with a 155 horsepower Cirrus Major III, is its low fuel consumption of eight gallons per hour at cruising speeds.

Equally noteworthy is its ability to take off and land on short runways. Its take-off

and landing runs, allowing for a ten-mile-an-hour wind, is 130 and 100 yards respectively. It can climb 700 feet per minute. Cruising speed is 118 miles an hour and range 530 miles.

This Chrislea-built plane has dual control and hydraulic brakes. Complete blind-flying instruments are built into its instrument panel. Its undercarriage fitting is adaptable to take the Goodyear cross-wind landing gear.

Science News Letter, April 15, 1950

ENGINEERING

Relief from Commercials

► A BRONX cheer, a handclap, or a loud "Shut Up!" Any sharp sound will now stop your radio from playing for a certain set length of time, if it is equipped with a new device.

The electronic circuit that does this, dubbed the "Advertiser-Killer" by Dr. I. Clyde Cornog of the University of Pennsylvania, is described in the AMERICAN JOURNAL OF PHYSICS (Feb.).

At a handclap or other sharp sound, the radio becomes silent. It then remains silent for a certain, predetermined length of time, for instance one minute, the time often taken for commercial announcements.

The device operates by detecting the difference between normal sound level, and the sharp sound that activates the circuit to cut off the radio.

The circuit is described in detail, includ-

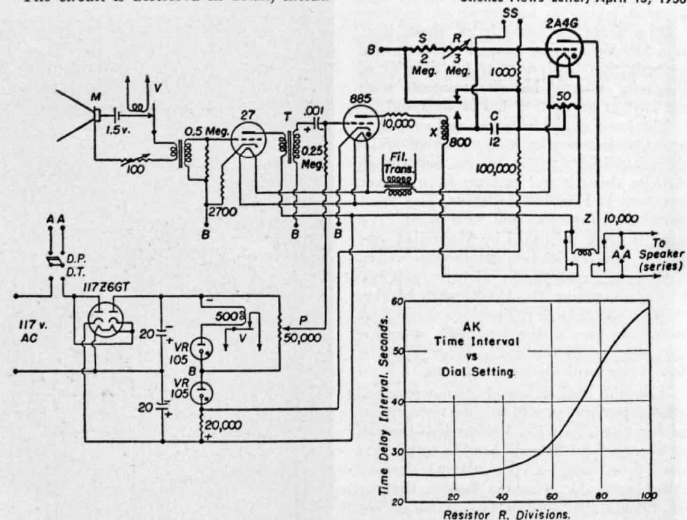
ing the controls necessary to make it an ever-ready adjunct to the radio. The sound signal enters a collecting horn fitted to a carbon microphone. The output is amplified and fed to the grid of a gas triode tube.

This triode tube acts as the trigger to a time-delay circuit. By means of a relay, the time-delay circuit opens the loud speaker and keeps it open for the pre-set interval.

It would be possible, Dr. Cornog states to trigger the device by means of a sound of very small frequency range, such as a whistle of a given pitch, instead of a handclap. This would give the advantage of less chance of response to common sounds or to loud music.

The device could also be altered so that the radio would play again as the result of another sound rather than at the end of a certain time period.

Science News Letter, April 15, 1950



INNER CIRCUIT OF THE ADVERTISER-KILLER—The circuit consists of: the sound receiver with its amplifying system at left, the gas triode and relay in the middle which serve to trigger the time-delay circuit shown in heavy lines at the right, and the power supply, below at the left. The graph shows how the silent period of the radio (time-delay interval) varies with the setting of its control rheostat R.

PUBLIC HEALTH

Natural Barrier to Plague

A broad area north of the Mexican-U. S. border prevents the propagation of bubonic plague. There is no record of either infected man or animal crossing the border.

➤ A NATURAL barrier against bubonic plague exists along the Mexican-United States border, Dr. Vernon B. Link, U. S. Public Health Service, declared at the meeting of the United States-Mexico Border Public Health Association.

"There is a broad area north of the border which is particularly arid in character and apparently not suitable for the propagation of wild rodent plague," he reported. "On the Mexican side of the border the country is similar, with no known record of wild rodent plague, as far as is known."

"Because of this natural barrier on both sides of the border, it is considered that plague is not an important border public health problem and that there is very little danger of wild rodent plague being exported into or imported from either country."

"There is always the danger that infected humans or domestic rodents may cross the border. However, there is no record of this having occurred in the past and it may never happen in the future."

Plague in wild rodents, such as ground squirrels, is a very important potential source of human plague epidemics, Dr.

Link warned, because of the constant danger that the plague germs will get to the domestic rodents, rats and mice, and then to man. There is also the danger that a human case of bubonic plague coming originally from wild rodents may develop pneumonic signs and spread germs directly from man to man without the need for rats or insects to help in the spread.

Four cases of human plague, one of them fatal, have occurred in New Mexico since July, 1949. The victims all lived in the rural areas of Taos, Sandoval, Lincoln and Lea Counties, a good many miles from the U. S.-Mexican border.

Every county along the border from San Diego, Calif., to Kinney County, Texas, has been investigated for wild rodent plague more than once, Dr. Link reported. Since 1937, some 50,000 rodents were trapped or shot in these border counties.

Only eight plague-infected ones were found, seven in San Diego County and one in Dona Ana County, New Mexico. There is some doubt, Dr. Link added, that the Dona Ana animal really had plague, since nearly 5,000 animals have been examined

in that county since then without finding plague in any.

Science News Letter, April 15, 1950

WILDLIFE

Refuge Has Rush Season; Swans Stage Come-Back

➤ MORE trumpeter swans were seen on the Red Rock Lakes migratory waterfowl refuge, near Yellowstone Park, last winter than ever before, advises the U. S. Fish and Wildlife Service.

On Feb. 28, refuge personnel who were performing their usual feeding duties at one of the lakes observed more than 200 trumpeters present for their hand-out of wheat. This is more than had ever before been seen at one time on the refuge.

A total of 453 bushels of grain were fed last winter to the swans at the feeding stations maintained on their refuge by the Fish and Wildlife Service. An average of about 50 swans at a feeding were observed applying for supplementary rations.

The rest of the estimated 330 birds that maintain residence on the refuge flew back and forth among the various lakes, Yellowstone Park, and the Snake River, utilizing the abundant aquatic food found in the open waters.

During winter the lakes and reservoirs of the refuge are kept relatively free of ice by the influx of water from hot springs. This makes the area one of the best utilized wintering and nesting grounds of trumpeter swans. A total of over 450 swans are believed to be residents of the U. S. Several hundred other trumpeters are known to live in Canada and southeastern Alaska.

Although bad weather has caused the death of some trumpeter swans in British Columbia and Alaska this last winter, the populations of the beautiful birds are not endangered, and the species is gradually making a come-back from a once-near extinction.

Science News Letter, April 15, 1950

CHEMISTRY

Glass Fabric and Resin Make Light-Weight Braces

➤ GLASS fabric bonded with a specially developed plastic resin is used to make-to-order corrective braces that are lighter in weight and better fitting than the usual aluminum and steel devices.

This new plastic laminate orthopedic aid originated from a chemist's desire to make a more comfortable brace for his daughter. Dr. Richard W. Quarles, working at Mellon Institute, Pittsburgh, took his problem to Dr. J. L. Young on the same staff. With cooperation from Bakelite scientists, two liquids were developed that when mixed can be coated on plaster forms to give a hard rigid plastic overnight.

Science News Letter, April 15, 1950



RIVIERA FOR SWANS—One of the many rare trumpeter swans responsible for the successful winter season at Red Rock Lakes migratory waterfowl refuge, this beautiful bird rests on one of the lakes in the sanctuary.

CHEMISTRY

Fruit Spray Makes Fruit Available Earlier

► IF apples and peaches pop up at your grocer's a month ahead of schedule this year, thank a potent chemical nicknamed 2,4,5-T.

Department of Agriculture scientists say they will run "limited commercial tests" this spring on the newly-discovered ability of this weed-killing plant hormone to ripen fruit early on the trees.

When 2,4,5-T (the T stands for trichlorophenoxyacetic acid) is sprayed on apple or peach trees, the fruit matures as much as 30 days ahead of nature's timetable. Early summer apples, when the market is most competitive, can be hurried 5 to 13 days, experiments at the Agricultural Research Center showed.

The three scientists who head the project, Dr. Paul C. Marth (hormones), C. P. Harley (apples) and Dr. A. Leon Havis (peaches) warn in the journal, *SCIENCE*, (March 31), that there is "considerable danger of immediate or permanent fruit tree damage" in using the material.

Developed during the war, 2,4,5-T and its chemical cousin 2,4-D have come into wide use as weed-killers. Scientists are not sure how these hormones work. They think in strong solutions they pep up plants or weeds so much they die for lack of enough sustenance from the soil and air.

Science News Letter, April 15, 1950

PSYCHIATRY

One Psychiatrist Can Save VA One Million a Year

► THE taxpayers of America could be saved \$25,000,000 if the cost of running three mental hospitals for one month could be plowed into research, Dr. Karl A. Menninger, director of the Menninger Foundation, Topeka, Kans., declared at a meeting of the Foundation's board of governors in New York.

A research experiment at the Foundation last year, costing about \$5,000, "resulted in the cure of a patient whose illness had already cost \$20,000 and would have gone on to cost someone another \$130,000," Dr. Menninger reported.

Mental illness is "the costliest illness in the world," he declared.

One patient who is made to wait too long before treatment or who is inadequately treated and becomes a chronic case who must be given custodial care the rest of his life costs the nation from \$50,000 to \$150,000, depending on the type of care given him. Every patient whose illness is arrested and who is returned to society represents a saving to someone of about \$100,000.

Of 500 patients now waiting to be admitted to one Veterans Administration hos-

pital (Winter Hospital at Topeka), about 100 may be able to manage without treatment and another 100 will become chronic cases regardless of the efforts of psychiatrists. But if the other 300 can be adequately treated and restored they will cost the government an average of \$3,000 a piece. Untreated or unsuccessfully treated, assuming that they all become chronic and live an average life span, the 300 will cost the government \$30,000,000.

Stressing the importance of educating and training more psychiatrists, Dr. Menninger pointed out that while it costs about \$50,000 to train one psychiatrist, "any psychiatrist who is any good at all will save the Veterans Administration a million dollars a year."

Science News Letter, April 15, 1950

VETERINARY MEDICINE

New Drugs More Effective For Worming Dogs

► A NEW synthetic drug for worming dogs is reported in Kansas City to be more effective than any now in use by veterinarians.

Trade-named "Anthelin," its full chemical designation is a tongue-breaker: N-methyl tetrahydro methyl nicotinate-p-carboxyphenyl stibonic acid. It was developed by Jensen-Salsbery Laboratories, Inc., of Kansas City.

One dose of the compound caused experimental dogs to eliminate more than 90% of both tapeworms and ascarid worms in their intestines, chemists James A. Austin and P. L. Kartsonis of the veterinary laboratories reported to the *JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION* (April).

Previous studies have shown that approximately 20% of all dogs have one or both types of worms.

Science News Letter, April 15, 1950

INVENTION

Combination Machine Mows Lawns and Trims Hedges

► A SINGLE machine to cut the lawn and trim the hedge, patented recently is an invention that ought to gladden the suburbanite now facing the busy season of week-end chores. It is an electrically-driven device, but the cutting bar and motor have to be removed from the lawn mower when used in hedge trimming.

The cutting bar is like the type ordinarily used with farm mowing machines. It is mounted well to the front of the two-wheel mower frame. The motor is on a shaft projecting to the rear from the cutter. An ingenious device converts the rotary motion of the shaft to reciprocating motion in the cutter. Inventor is William G. Gordon, San Antonio, Texas. Patent number is 2,502,943.

Science News Letter, April 15, 1950

IN SCIENCE

ENTOMOLOGY

Hormone Juggling Produces Siamese-Twin Cockroaches

► AN ARMY scientist studying hormones has produced Siamese-twin cockroaches. One member of this strange dual insect grows from the back of the other. The bottom cockroach, poor fellow, has to do all the eating.

Dr. Dietrich Bodenstern, insect physiologist at the Army Chemical Center in Edgewood, Md., told the Entomological Society of Washington that, as with human beings, hormones apparently control the growth of insects. Tampered with experimentally, they can produce such weird results as the piggy-back cockroaches.

They can also cause insects to jump several stages in their normal development from larvae to adult, "growing up" extraordinarily fast, Dr. Bodenstern said. Transplanted hormone glands from one insect "brain" to another do the trick.

Scientists can learn much about growth and heredity by studying insects, because they can produce many generations within a short time.

The Army's work with insects is tied in with insecticides and "development of new substances like insecticides," Dr. Bodenstern said.

Science News Letter, April 15, 1950

ZOOLOGY

Where Is the Female Bat in the Rugged Winter?

► IT is a man's world for the little brown bat. During the winter the ratio of males to females found in the northeastern part of the United States and in Canada is about three to one.

In the summer, when the bats move to hot, dark attics, the males do not stay with the females, but live apart, untroubled with family cares.

This was revealed by Dr. Harold B. Hitchcock, associate professor of biology at Middlebury College, Middlebury, Vt., at the seventh annual convention of the National Speleological Society in Washington. The Speleological Society consists of professional and amateur cave explorers.

Dr. Hitchcock asked the cave men and women to check up on this bat sex ratio. He wants them to try to discover what happens to the females in wintertime. Have they found some snug cranny where biologists have not yet discovered them? Do they die off, leaving a surplus of males by the time for hibernation? Or do the females migrate in greater numbers to another part of the country?

Science News Letter, April 15, 1950

THE FIELDS

MEDICINE

Penicillin Supplants Surgery As Lung Abscess Treatment

➤ **PENICILLIN** is now making surgery unnecessary in the treatment of acute lung abscesses, Drs. A. W. Sutherland and L. J. Grant of the London Chest Hospital declare in a report to the *LANCET* (March 25), British medical journal.

The new method of treating these abscesses consists in giving 2,000,000 units of penicillin daily. In addition, the patient is placed for many hours each day in the best position for drainage and assists this with control of coughing. The physiotherapist helps by striking short, sharp blows (percussion) on the chest wall. This does the job by combining elimination of the infection with emptying of the abscess cavity.

Science News Letter, April 15, 1950

MEDICINE

Worms Can Cause Cancer—in Rats

➤ **FIRST** proof that a living creature above the level of germs or viruses can be involved in causing cancer has been obtained by Dr. W. F. Dunning of the Detroit Cancer Institute, the American Cancer Society announced in Detroit. The Society supports Dr. Dunning's research.

The cancer-causing animals are tapeworms. Rats are their victims. In what the American Cancer Society terms "germ warfare between cats and rats," cats get tapeworm larvae into their systems by eating rats infested with the worms.

The cats, says the society, "transform the tapeworm into a source of lethal cancer for the rats."

When the rats eat grain infested with eggs from tapeworms of the cats, the worms cause cancers in the rat livers.

Only certain strains of rats develop liver cancers from these tapeworm eggs. Actual cause of the cancer, Dr. Dunning thinks, may be a virus transmitted by the tapeworm.

Science News Letter, April 15, 1950

NUTRITION

Strange Plants Yield Valuable Food Products

➤ **YUCCA** flowers, pumpkin leaves, pigweeds, lambquarters, and other unusual plants can furnish nutritious food for Central Americans, scientists of the Massachusetts Institute of Technology reported to the American Chemical Society in Philadelphia, Pa.

As part of an investigation of new and old kinds of edible food that can be obtained from plants south of the Rio Grande, some of extremely high nutritive value were found among more than 200 varieties tested for composition.

High quality foods have such names as: chipilin, chaya, chayote points and leaves, cassava leaves, malva, mora, guapinol, as well as parsley, laurel and cashew apple.

The group from the MIT Nutritional Biochemistry Laboratories included: Drs. Hazel E. Munsell, Louis O. Williams, Louise P. Guild and Robert S. Harris.

Science News Letter, April 15, 1950

SEISMOLOGY

Prediction of Quakes More Remote than Ever

➤ **THE** chances of predicting where an earthquake will strike are more remote now than at any previous time.

The number of recognized unsolved problems in all fields of geophysics is increasing rather than decreasing, Dr. B. Gutenberg, seismologist at California Institute of Technology, states in the journal *SCIENCE* (March 31). We now have more data available than ever before about seismic activity.

The theories that are advanced concerning the structure and the processes in the earth's crust have become less and less certain as more data accumulate, he states.

Starting with the year 1904, all great earthquakes and most major shocks have been reported by instrument stations all over the earth. From over 100 stations then, there are now roughly 300 seismological stations that can time an earthquake within one second.

Science News Letter, April 15, 1950

PHYSICS

Room Affects Rate and Force of Speaking

➤ **BOTH** the rate and the force with which you speak are affected by the room you are in.

Dr. John W. Black of Ohio State University drew these conclusions from a study he made of the way in which 184 males read 12 test phrases. He used a total of eight rooms to test the different ways in which the phrases were read.

The rooms varied in size, shape and reverberation time. Dr. Black found that phrases were read more slowly in large rooms than in small ones. Among the large rooms, the rate of reading was slower in live rooms than in dead rooms. A room that reverberates highly is considered a live room. One that does not reverberate is called dead.

Dr. Black found that the intensity of reading was greater in dead than in live rooms, particularly in the larger rooms. He reported his findings in the *JOURNAL OF THE ACOUSTICAL SOCIETY OF AMERICA* (March).

Science News Letter, April 15, 1950

CHEMISTRY-AGRICULTURE

Real Maple Sirup Flavor Not Present in Tree Sap

➤ **THE** delicious flavor of real maple sirup (spring is not far off even in Vermont) is actually not present in the sap as it is collected from the trees, three U. S. Department of Agriculture chemists reported to the American Chemical Society meeting in Philadelphia, Pa.

The prized flavor is developed during the traditional processing of the sap to sirup through the browning reaction, they discovered in tests at the Eastern Regional Research Laboratory at Philadelphia.

By using other and seemingly more efficient methods of making the sirup, an essentially flavorless product can be made. Such disappointing methods as low temperature evaporation either by distillation or by freeze drying gave the clue to the fact that organic acids may enter into the reaction that produces the flavor.

The chemists in the investigating team were: Drs. William L. Porter, Charles O. Willits and M. L. Buch.

Science News Letter, April 15, 1950

BOTANY

Blue Plant Substance Is Flowers' Voice of Spring

➤ **A** **BLUE** plant substance named phycocyanin may be the voice of spring telling flowers it is time to blossom again. The sensitive pigment somehow times daylight and darkness.

The Department of Agriculture released further information on this discovery by three of its scientists, Drs. H. A. Borthwick, M. W. Parker and S. B. Hendricks.

Science Service reported exclusively in January that the scientists thought they had the key to the mysterious mechanism which controls plant development in accordance with day-length or night-length. The phenomenon is known as photoperiodism.

Present in such low concentrations that it cannot be detected by eye, the blue pigment was identified as the day-length trigger mechanism by use of a spectroscope. With it the scientists shot carefully controlled light at plants sensitive to day-length, watched to see which wavelength of light prompted the flowers to blossom.

Their announcement notes that the pigment may be related to the hormone materials controlling animal life. Similar materials have been isolated from butterfly wings and birds' eggs, they said.

Thus, by studying why some plants blossom only when the right balance between night and day is reached, the scientists may discover the same sort of reaction controls such phenomena as shedding of fur or feathers by animals and birds.

Science News Letter, April 15, 1950

GENETICS

Cancer in Tropical Fish

Scientist studies the effects of heredity on pigmented cancer cells of platyfish. Playing with their genetic balance may give knowledge of heredity in cancer.

By WADSWORTH LIKELY

► TUCKED away, practically in the attic of the American Museum of Natural History in New York, are 3,000 tropical fish and a man who has spent 30 years with them.

He is Dr. Myron Gordon, geneticist of the New York Zoological Society. He is studying "black cancer"—melanomas—the kind that in humans sometimes, but fortunately rarely, develops from moles.

In his 30 years of breeding fish, he has found in these fish a link between heredity and black cancer.

Specifically, Dr. Gordon is studying the effects of heredity on pigmented cancer cells—what happens in the offspring of black-spotted fish with certain known kinds of genes.

Aid in Cancer Fight

The important thing about Dr. Gordon is not only what he has been able to contribute to the general but still incomplete knowledge about cancer. It is that he is typical of hundreds of scientists, in hundreds of research laboratories, each studying particular parts of this big problem, each contributing their bits of new-found knowledge to the picture.

Some day, that picture will take complete shape. Then we shall know what causes cells to run wild and destroy the body. When we know that, we shall begin to know how to deal with cancer.

But Dr. Gordon's work of inter-breeding different species and different populations of tropical fish has a larger application than just to cancer. In a recent report on his work, he said: "From the point of view of public health and preventive medicine, it is of the utmost importance to know the frequency of 'injurious' genes in populations. With knowledge of gene frequencies, students of population genetics and statistics will be able to predict the frequencies of these diseases in which the genetic factor is paramount. Great strides are being made in the study of the blood groups in various human populations. In the future the practice will and must be extended into every important genetically influenced condition of man."

A condition of geography made Dr. Gordon's current studies possible. In southern Mexico, Guatemala and British Honduras there are six rivers that empty into the Gulf of Mexico and the Caribbean Sea.

Geologists have told Dr. Gordon that these rivers have been separated for at least 300,000 years.

But there are fish of the same species—the platyfish—in all the rivers. However, even though six of these fish belonged to the same species, there were differences in coloring. Some were spotted on the side, some had stripes, some had small black spots in their dorsal fins.

Variety of Spotted Patterns

In all Dr. Gordon found five different varieties of the heavily spotted patterns on his platyfish. The pigment cells that go to make up the patterns are large and are called macromelanophores. The black pigment cells that cover the body as a whole are small, they are called the micromelanophores.

Macromelanophores are potentially dangerous, because they may change radically from normal cells to cancerous ones. When this happens, black cancer, or melanoma, results. And Dr. Gordon has observed that the melanomas so produced contain almost a pure culture of melanoblasts, the cells characteristic of both mouse and human black cancers.

These melanoblasts, says Dr. Gordon, from fish, mouse and human, have almost identical structures when viewed under the microscope.

But when Dr. Gordon gathered these fish from the Central American rivers—more

than 10,000 platyfish among which 2,000 had the large potentially dangerous melanophores—not a single fish was found with a black cancer.

Yet, when he mated platyfish with spots on their fins from different rivers—different populations—he found those large black cells in some of the hybrid offspring changing into black cancer, covering all of the dorsal fin and sometimes spreading out over the body.

Dr. Gordon mated some of his platyfish with swordtails from the same rivers—two fish which do not mate in nature. If the platyfish had large black pigment cells, the children of the match which had black spots developed black cancer.

Why did the populations which had been kept from each other for 300,000 years or more have no cases of cancer? Why, when the populations were mixed, did some of the children of platyfish from different rivers become extremely black?

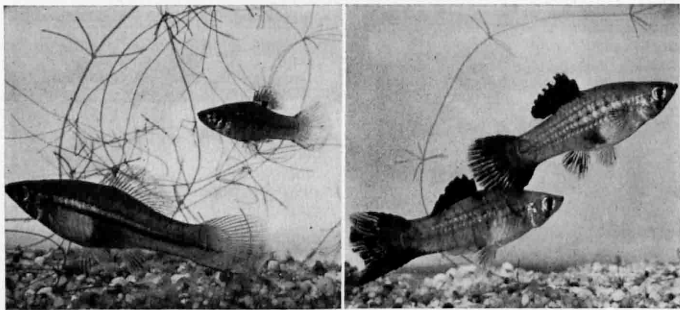
Dr. Gordon figures that the genetic balance was upset. Genes are the units of heredity. They determine the color of our hair, of our eyes, and a lot more. They react with the environment in which we grow up and with other genes within us.

There are bad genes and good ones. There are modifying genes which control the bad or good effects of other genes.

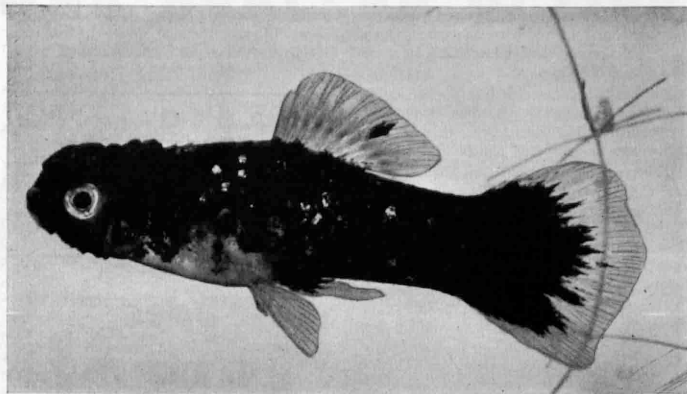
Black Cells a Mutation

Dr. Gordon speculates that way back in geological time, the platyfish were like most fish of their kind that are uniformly colored, unmarked by large black cells, or macromelanophores. Then something happened to the heredity of one platyfish, called mutation, which is what takes place when a gene of one kind changes into another kind.

Some previously existing cells in this



PURE-BRED PLATYFISH AND HYBRID—The black spot on the base of the dorsal fin of the platyfish (upper left) is a potentially dangerous black pigment cell. On the right are hybrid offspring, result of breeding platyfish with a larger fish, the swordtail. In the hybrids, black cancer, melanoma, has developed and almost covers the dorsal fins. The genetic balance, which kept the black pigment cell from developing into cancer, has been upset.



RESULT OF GENETIC UPSET—This platyfish shows the result of upsetting the genetic balance for both black and red pigment cells. The melanomas have spread over almost all the body.

platyfish were changed into macromelanophores. Biologists and geneticists know that most mutations are harmful, if not lethal, and therefore, the gene which produced these spots was probably a killer. The black cells grew without restraint and probably produced black cancer.

But there were other mutations, and some of them must have produced in some platyfish not yet hit by black cancer cells the genes which could modify or restrain black cancer cells.

Genetic Balance Set Up

Thus when the platyfish with the modifiers mated with the fish with the lethal, potentially black cancer cells, a genetic balance was set up.

Thus there was produced in different rivers different strains of the same species of fish which transmitted, from one generation to another, genes which produced potentially dangerous macromelanophores. They never did get dangerous—develop into black cancer—because a delicate genetic balance had been set up.

Balance Upset

Dr. Gordon has upset that balance in his museum attic aquarium. By upsetting the genetic balance and studying the results, he can learn a little more about the hereditary factors in cancer. He says, "If the practical aspects of these studies seem remotely associated with the immediate need for the discovery of the cause and the cure of cancer, the fact that follows should be kept in mind—we geneticists never forget it."

"The cancerous fish produced genetically are used as our aquatic guinea pigs. We are seeking the answers to these questions: What chemical and physical forces can change normal melanophores to cancerous

melanoblasts? What chemical and physical agents can reverse the process in changing the cancerous melanoblasts back to normal pigment cells? These are the problems for today and tomorrow."

Science News Letter, April 15, 1950

MEDICINE

Parrot Fever Stopped By New Chemical

➤ GROWTH of the parrot fever virus can be stopped, in the test tube at least, by a chemical hailed last year as a potential weapon against cancer.

The chemical is called guanazole. Its virus-stopping action was discovered by Dr. H. R. Morgan of the University of Michigan at Ann Arbor, in research supported by the American Cancer Society.

Guanazole has not so far been reported to have any appreciable effect in arresting tumor development in cancerous animals, says the American Cancer Society. The Society also says Dr. Morgan has not tested guanazole in animals.

Science News Letter, April 15, 1950

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PHYSICS

New Glass Transmits Invisible Heat Radiations

➤ A NEW glass that can be easily molded yet has the ability to transmit invisible heat radiations, or infrared rays, has been developed in Evanston, Ill.

Dr. Rudolph Frerichs, physicist at Northwestern University who came to the United States from Germany two years ago, discovered how to produce this new type glass.

The easily molded, infrared transparent glass may have important applications for research instruments, in various industrial applications and in the development of war weapons using the extremely long wave lengths.

Dr. Frerichs found that arsenic, combined with sulfur, forms the new reddish-colored glass.

Up to now different kinds of natural or artificial crystals, such as quartz or rock salt, have been used successfully in infrared spectrographs. But the size of the optical parts made from these crystals is limited because the lens and prisms have to be cut and ground from the available stock.

On the other hand, ordinary glass can be molded into any desired shape or size. However, glass heretofore available did not transmit infrared rays.

The new glass can be produced to transmit different regions of the infrared spectrum. For example, by changing its composition it can be made entirely opaque to block out all visible rays while still transmitting infrared rays. This characteristic will allow the new glass to be used in optical instruments when every trace of visible light has to be excluded.

Science News Letter, April 15, 1950

ATOMS PLANETS & STARS Astronomical Wall Chart

(Not A Star Map)

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ASTRONOMY VISUALIZED BY GRAPHIC ILLUSTRATIONS

Dr. Albert Einstein wrote as follows:

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"The drawing is excellent and informative. You certainly have given an enormous amount of information in a limited space."—DR. FOREST RAY MOULTON.

"I have never before seen the various features of the solar system and the earth shown so skillfully."—DR. M. M. LEIGHTON.

"The author has produced for display in school or study, a useful quick-reference sheet for the student of elementary astronomy."—JOURNAL OF THE BRITISH INTERPLANETARY SOCIETY, London.

James Oliver Hogg, Jr.
1840 Burnham Bldg., Chicago 1, Illinois

METEOROLOGY

Dust Bowl to Get Little Relief During April

► THE nation's dust bowl can expect little relief in the form of rain during April. The U. S. Weather Bureau's extended forecast says that precipitation will be below normal in most of the states of the Midwest, below the northern plains.

Rain will also be below normal in the southeastern states. Near normal precipitation is expected by the Weather Bureau in New England, the central Atlantic states, and the western mountain states, as well as on the northern plains. Only the west coast will get greater than the normal amount of rain during April.

In the East, the weather will be colder than normal during April, but most of the western half of the nation will have warmer than normal temperatures.

Near normal temperatures are expected during next month in a belt extending from Minnesota southward to Louisiana.

Science News Letter, April 15, 1950

Words in Science—**GEOLOGY-PALEONTOLOGY**

► GEOLOGY is the study of the composition, structure and history of the earth. It covers a wide range of specialized fields of science.

Paleontology is one of them. It deals with the life—both animal and plant life—of past geologic periods, based on the study of fossils.

The paleontologist is interested in a fossil for hints as to the nature of the organism which caused it. The geologist uses the fossil as a valuable aid in determining the age of the sedimentary rock in which it occurs.

Science News Letter, April 15, 1950

AGRICULTURE

Spectacular Potato Growth From Trace of Molybdenum

► "SPECTACULAR results" from potatoes exposed before planting to tiny amounts of the trace element molybdenum are reported by the New Jersey Agricultural Experiment Station of Rutgers University.

Certain metallic elements such as molybdenum are necessary to the growth of various plants, much as calcium is necessary for strong human teeth. Potatoes are among those needing molybdenum.

But scientists found that when farm soil has an acid nature, the molybdenum in it is tied up in such a way that potatoes cannot use it. And most potato land is kept on the acid side to control the scab diseases.

Soil experts at Rutgers suspected the spud might sometimes have a molybdenum de-

ciency. They tried soaking seed pieces in a weak (one-hundredth of one percent) solution of sodium molybdate, then planted them in greenhouse pots.

The treated plants grew like Topsy: 70.9% more top growth, 87.5% more growth of the potato tubers themselves, than a control group of untreated plants.

The researchers emphasized they are not yet ready to recommend the treatment for potato-growers' use. This spring Dr. E. R. Purvis, Rutgers soils specialist, and Milton Cowan, Middlesex County agricultural agent, plan six tests on New Jersey potato farms.

They hope the bath treatment will do as good work in the field as it did in the greenhouse.

Science News Letter, April 15, 1950

On This Week's Cover

► SCIENTISTS do not know how a sick egg feels, but they know what an egg looks like inside when it has the flu as shown on this week's cover of SCIENCE NEWS LETTER. And the picture illustrates how they inoculate the egg with influenza virus.

The Communicable Disease Center of the U. S. Public Health Service, in Atlanta, Ga., needed motion pictures of the interior of a fertile egg with a case of influenza and the Audio-Visual Production Services supplied the movies. The film was needed to illustrate the laboratory diagnosis of influenza.

A number of virus diseases can be diagnosed by inoculating fertile eggs with the disease organism. The organism, in the form of nose and throat washings from a patient suspected of having a virus disease, is inoculated into a 12-day-old chick embryo. Later studies help determine what type disease the patient has.

To photograph the developing embryo inside the egg, technicians cut windows on each side of the egg with an abrasive cutting disk. After each window is cut, they cover the opening with a transparent plastic window pane.

By placing a strong light on the back side, it is possible to look straight through, and also to photograph what is going on inside the egg.

Science News Letter, April 15, 1950

MEDICINE

Three and One-Half Minutes To Start Stopped Heart

► THREE and one-half minutes is the probable time limit a surgeon has for starting a heart that has stopped beating on the operating table.

If that time limit is exceeded, heart action may be restored and the patient live, but he will be left with irreparable brain damage, Drs. Frank H. Lahey and Edwin

R. Ruzicka of the Lahey Clinic in Boston report in the medical journal, SURGERY, GYNECOLOGY AND OBSTETRICS (Jan.).

Science News Letter, April 15, 1950

● RADIO

Saturday, April 22, 3:15 p.m., EST

"Adventures in Science" with Watson Davis, director of Science Service over Columbia Broadcasting System.

Dr. Kirby S. Howlett, Jr., President of the American Trudeau Society of the National Tuberculosis Association, will talk on "Chemicals Against Tuberculosis."

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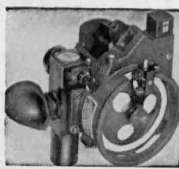
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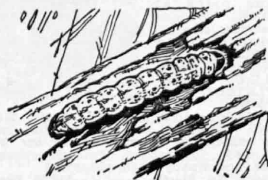


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The Great Corn Robber

► THE sensational Brinks holdup in Boston was like stealing pennies off a newstand compared to the larcenies of this worm. His annual haul is 300-fold as great, and he repeats his nefarious work year in and year out. A post office poster on him would read:

"WANTED, DEAD: The European Corn Borer, alias *Pyrausta nubilalis* Hubner. Last year alone he destroyed \$350,000,000 worth of corn. Operates in huge gangs from East coast as far west as Kansas, Nebraska, and the Dakotas. About one inch long, flesh colored, with small brown spots on back; sometimes takes disguise of a yellowish-brown moth with one-inch wing-spread. Kill on sight."

The European corn borer was first discovered in this country in New England near Boston in 1917. Since that time it has slowly made its way westward until today it infests the entire Corn Belt and adjoining states. It is still spreading and the experts know no way to stop it.

In its mature phase the insect assumes the form of a small moth. It is not the moth that does the damage but its offspring in the larval phase. The females lay egg masses of from five to 50 eggs on the under side of corn leaves. In a week or less the eggs hatch out, and the young larvae, or worms, bore into the stem, the stalk, or the ear.

They continue to eat and to grow, then develop a flimsy cocoon, from which they emerge as adult moths, to continue the cycle over again, sometimes producing two and even more broods of the injurious insects during a single growing season.

One of the most ambitious attempts to control the corn borer has been the introduction of various birds, insects, and diseases which might kill the borer off in large numbers. None of these "biological" enemies has been very successful. From 1919 to 1940 huge numbers of potential enemies were imported and tested. Larvae of many different insect enemies were imported, over 23,000,000 of them from Europe and 3,000,000 from the Orient. None of this vast host has had any serious effect in cut-

ting down the numbers of corn borers. Similar negative results have been obtained with birds and parasitic diseases.

The most effective measures are the thorough clean-up of crop residues, use of DDT and other prescribed insecticides, use

of borer-resistant crops, plus continual watchfulness for the tell-tale eggs. But even all these precautions can give only a limited degree of control. Extermination is out of the question at the present time.

Science News Letter, April 15, 1950

ICHTHYOLOGY

Florida Fishing Bonanza

► RED snappers' stomachs and electronic "shrimp-finders" may make recently-discovered shrimp grounds off Key West, Fla., the biggest fishermen's bonanza in years.

So-called "pink" shrimp have been found in the stomachs of red snapper fish as far up Florida's west coast as St. Petersburg, the U. S. Fish and Wildlife Service reports in Washington. That is practically all that is known about the extent of the new grounds, the experts admit.

But since early February, nearly the entire Florida shrimping fleet—more than 150 boats—have moved into coral-studded waters around Dry Tortugas, tiny islands 200 miles south of St. Petersburg and some 60 miles west of President Truman's vacation White House at Key West.

They have found so many shrimp the boats have not bothered to investigate how far the new grounds may extend, government fisheries specialists say. Eastern seaboard cities are being supplied almost entirely from the Dry Tortugas area—between 100,000 and 200,000 pounds of shrimp a

week to New York alone.

Fishery biologists believe the shrimp are colored pink because of the coral. Actually they are of a family known as "brown-spotted grooved shrimp" or *Penaeus duorarum*, formerly found in small numbers off North Carolina in summer and in the western Gulf off Texas and Mexico.

Shrimp as well as treacherous reefs are being spotted by ultrasonic depth recorders. East coast shrimpers, not accustomed to fishing such bottoms or at night, are installing them as fast as they can get them.

The echo sounders were originally designed by marine scientists of Bendix Aviation Corporation during World War II for charting enemy harbors, locating mines and aiding warship navigation.

But shrimpers found they not only could give warning of net-tearing coral peaks and ridges on the bottom. These electronic fish-finders could be used to locate clouds of shrimp. If the recorder suddenly jumps a fathom or two: Lower the nets, boys!

Science News Letter, April 15, 1950

ENGINEERING

Revolution in Molds

► A PLASTIC process that makes possible the first revolution in molds for metal casting since the beginning of the iron age was announced in Chicago.

Hand finishing of cast metal machine parts is eliminated by new plastic bonded sand molds announced by the Bakelite Division of the Union Carbide and Carbon Corporation, at the National Plastics Exposition.

Where formerly a wooden pattern was pressed into sand every time a casting was to be made, resulting in a rough surface which had to be worked down by hand operations, the new process gives a smooth surface and sharp corners on castings as they come from the mold. This results from mixing a small quantity of a phenolic resin with the molding sand.

The skilled craftsman, in the new process, makes the original pattern in metal. This is then coated with the resin sand mixture and baked, resulting in a thin mold which may be duplicated for as many castings as are desired. Cores for the inside of hollow pieces are formed similarly, by blowing the resin sand mixture into the crevices.

After baking, the molds are assembled, backed with lead shot to keep the halves

solidly together, and filled with molten metal. New molds, each an exact duplicate of the original hand-made model, are used for each casting. Each casting comes out smooth and ready for use. Used molds are broken up and the sand re-used.

The inventor of the process is Johannes Croning, of Hamburg, Germany, who has been in this country developing this method which will be licensed by the Crown Casting Associates in Boston.

Science News Letter, April 15, 1950

MEDICINE

Vaccine Will Protect Against Scotland Smallpox

► VACCINATION with a good vaccine will protect against even the virulent smallpox reported epidemic in Glasgow, Scotland.

The vaccine used against smallpox is not made from a weakened, or attenuated, smallpox virus, but from cowpox virus. There are different strains of smallpox virus, but the cowpox virus seems to give immunity against all of them.

Science News Letter, April 15, 1950

Books of the Week

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THE AMERICAN NATIONAL RED CROSS: Annual Report for the Year Ending June 30, 1949—*American National Red Cross*, 223 p., illus., paper, free upon request to publisher, Washington 13, D. C. A resume of the Military Welfare Service, home service, and other services performed by the Red Cross during the past year.

A.S.T.M. STANDARDS ON PAINT, VARNISH, LACQUER, AND RELATED PRODUCTS—*American Society for Testing Materials*, 671 p., illus., paper, \$4.85.

ELECTROPLATING—A. H. Sanders—*International Textbook*, 118 p., illus., \$2.75. Principles, techniques, and fundamentals of this field. For the beginner.

GENERAL CHEMISTRY—P. W. Selwood—*Holt*, 681 p., illus., \$4.60. An introductory college text.

HELP AT LAST FOR CEREBRAL PALSY—Eugene J. Taylor—*Public Affairs Committee*, 31 p., illus., paper, 20 cents. A brief discussion of the many problems involved and suggestions for their solution.

A HISTORY OF BIOLOGY: A General Introduction to the Study of Living Things—Charles Singer—*Schuman*, rev. ed., 579 p., illus., \$5.00. A general introduction to man's discoveries concerning his world and his fellow creatures, including Aristotle's, Descartes' and Mendel's findings.

HUNTING, FISHING, AND CANOE TRIPS IN CANADA—*Canadian National Railways*, 120 p., illus., paper, free upon request to publisher, in care of J. S. McDonald, General Tourist Agent, Montreal, Quebec, Canada. For the outdoorsman planning a trip at any season.

JOSEPH HENRY: His Life and Work—Thomas Coulson—*Princeton University Press*, 352 p., illus., \$5.00. The biography of one of America's foremost physicists.

NUMERICAL SOLUTIONS OF DIFFERENTIAL EQUATIONS—H. Levy and E. A. Baggett—*Dover*, 238 p., illus., \$5.00. A collection of numerical methods for solving ordinary differential equations of the first and higher orders.

PERFORMANCE OF MORGAN HORSES UNDER SADDLE—Walter M. Dawson, Ralph W. Phillips, and Earl B. Krantz—*Gov't. Printing Office*, 36 p., illus., paper, 15 cents. A compilation of data on 79 three-year-old Morgan Horses. Tests conducted by the Bureau of Animal Industry, U. S. Dept. of Agriculture.

PROCEEDINGS OF THE FIRST CLINICAL ACTH CONFERENCE—John R. Mote, Ed.—*Blakiston*, 607 p., illus., \$5.50. Proceedings of the First ACTH Conference, Chicago, October 21-22, 1949, under the auspices of Armour and Company.

PULSES AND TRANSIENTS IN COMMUNICATION CIRCUITS—Colin Cherry—*Dover*, 317 p., illus., \$3.95. An introduction to circuit analysis. For the communications engineer.

QUALITY CONTROL AND STATISTICAL METHODS—Edward M. Shrock—*Reinhold*, 213 p., illus.,

\$5.00. A step-by-step presentation of the operations of applying statistical methods to the problems of modern industrial quality control.

THE QUESTION OF LAY ANALYSIS: An Introduction to Psychoanalysis—Sigmund Freud—*Norton*, 125 p., \$2.50. The basic theories of Freud translated by Nancy Procter-Gregg. The first time this book has been available in English for many years.

A SEMIOTID FISH FROM THE CHINLE FORMATION, WITH CONSIDERATION OF ITS RELATIONSHIPS—Bobb Schaeffer and David H. Dunkle—*American Museum of Natural History*, 29 p., illus., paper, 25 cents.

THEORY OF SETS—E. Kamke—*Dover*, 152 p., illus., \$2.45. An introduction to this branch of mathematics. Translated from the Second German Edition by F. Bagemihl.

UNFAMILIAR OXIDATION STATES AND THEIR STABILIZATION—Jacob Kleinberg—*University of Kansas Press*, 131 p., illus., \$3.00. A monograph on the preparation, characterization and stabilization of familiar elements, such as the halogens, oxygen and iron, in unfamiliar oxidation states.

WORLDS IN COLLISION—Immanuel Velikovsky—*Macmillan*, 401 p., \$4.50. The author's theories on cosmic disturbances. (See SNL Feb. 25, March 25 and SNL April 15, p. 229).

Science News Letter, April 15, 1950

FREIGHTERS

If you don't quite run to the deluxe liners, go via passenger carrying freighter, the lower cost way to travel without dressing up. "Travel Routes Around the World" names hundreds of lines, tells where they go—Europe, West Indies, practically everywhere—how long they take, how much they cost, etc.

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MAJOR ENTRIES

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PET BED for the family cat or dog when riding in an automobile is set in a collapsible frame attached to the rear of a seat. The basket itself can be easily lifted out when desired, animal and all. This device has just received a government patent.

Science News Letter, April 15, 1950

SENSITIZED FABRICS, from silks to canvas, are obtained with a special chemical preparation and, after treatment, may be printed with a photograph. The dried sensitized cloth is printed and washed just as commercial enlarging paper is handled.

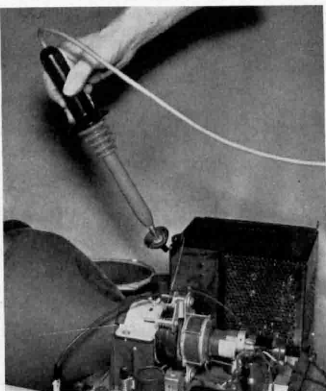
Science News Letter, April 15, 1950

WALKING FRAME for polio victims or the infirm aged is a three-sided stall-like affair made of magnesium tubing, the whole weighing less than three pounds. The four legs have rubber cups at their extremities to eliminate all danger of slippage on the floor.

Science News Letter, April 15, 1950

TINY NEW BATTERIES make possible fountain-pen-sized flashlights for uses ranging from keyhole finding to throat examining. In the flashlight, a jewel-like bulb is concealed in one end of a bullet-nosed, bright metal case, with the operating switch at the other end.

Science News Letter, April 15, 1950



HIGH-VOLTAGE PROBE, shown in the picture, aids electronic servicing and testing by extending the usefulness of popular low-current voltmeters to high-voltage work. It is designed to provide safe means for measuring high-voltage in such circuits as those used in television.

Science News Letter, April 15, 1950

NEW-SHAPE LAMP BULB, for incandescent electric light, when viewed in its recommended base-up position looks somewhat like an inverted mushroom. The lower portion of the bulb is covered with a soft-toned, permanent enamel finish that mellows the light.

Science News Letter, April 15, 1950

FEATHER-WEIGHT POSTAL scale, smaller than a fountain pen, will weigh letters accurately up to four ounces and indicate the postage needed instantly. It is an inexpensive device that will fit into a vest pocket or a woman's handbag.

Science News Letter, April 15, 1950

NURSING BOTTLE HOLDER, for the mother, is a cylindrical affair held over the chest by a strap around the adult's neck. With this recently patented device, baby can be held in bottle-feeding position with one arm, leaving one free for other purposes.

Science News Letter, April 15, 1950

ROLLER GRILL, for cooking hot dogs, is electrically operated and cooks electrically. It keeps the frankfurters revolving continuously while on the grill, and it has three heats. One is for fast cooking, one for slow cooking, and a third to keep the "red hots" hot until served.

Science News Letter, April 15, 1950

Do You Know?

Oystermen are sometimes called "tongers" in the trade.

Rot is wood's principal enemy; 2000 species of wood rot are known.

The human body is said to contain enough phosphorus to make 2,000 matches.

The 150-ton blue whale is larger than the largest of the dinosaurs of former geological ages.

When a tree is cut down, the rings in the wood visible on the stump tell not only the age of the tree but also indicates wet and dry years.

There is a steady upward trend in cigarette smoking in the United States; during 1949, some 352,000,000,000 were smoked, about one percent more than during 1948.

The well-controlled use of drugs to relieve the pain of childbirth during labor has not produced any increase in infant mortality, according to recent studies by two physicians.

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