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October 15, 1955

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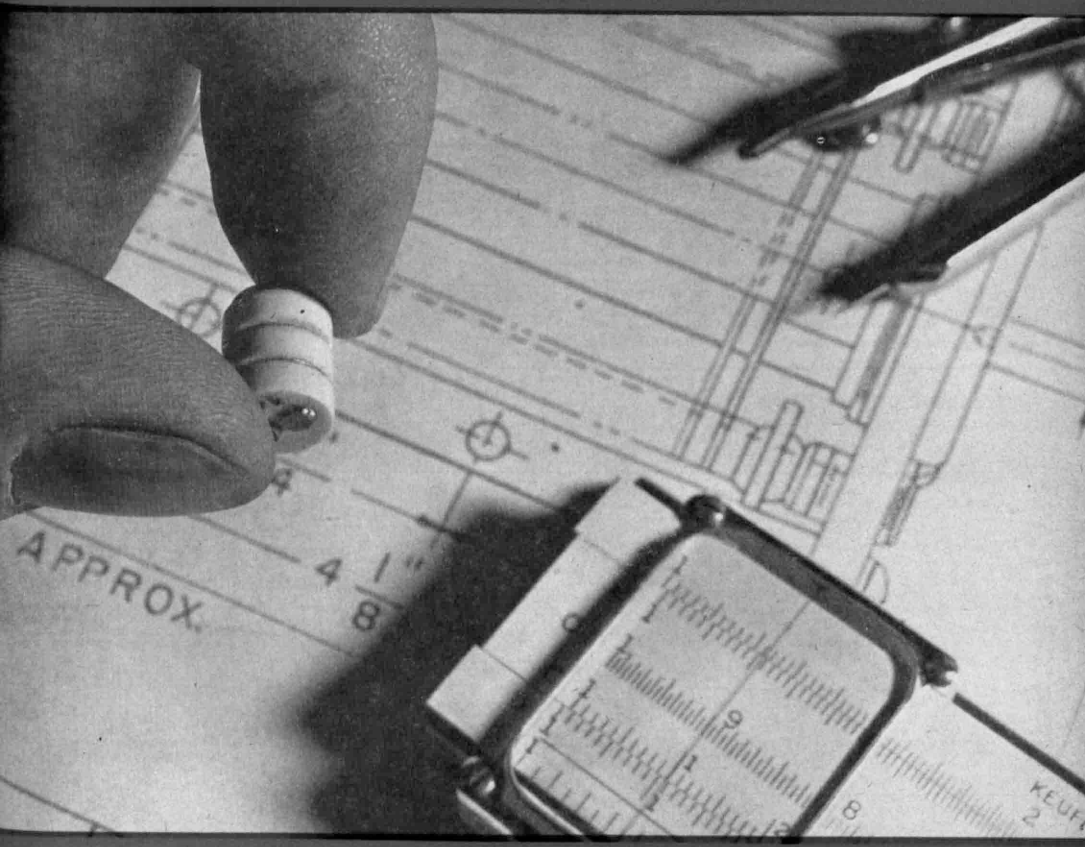
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Ceramic TV Tube

See Page 245

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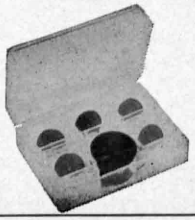

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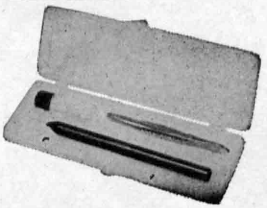

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ELECTRONICS

"Brains" To Defend U.S.

Electronic computers and radar installed in fighters can totally take over control of plane in assault on enemy bombers. Jets are now equipped with this electronic gear.

➤ TOTALLY AUTOMATIC defense of North America by guided missiles automatically directed to their target by giant electronic "brains" is only a matter of time.

This was foreseen here with the announcement of an electronic system automatically controlling aircraft flight and firing the plane's rockets at the proper instant after it is within 15 miles of its target.

Humans are still needed to direct the plane until the 15-mile limit, when its radar "eyes" spot the attacking bomber. The pilot then pushes a button, locking the radar on target.

An electronic computer takes over, flying the plane on interception course no matter how the bomber maneuvers.

At exactly the correct moment, which at the speeds of today's planes is too fast for human judgment, the rockets are automatically launched.

Every interceptor plane, both American and Canadian, now guarding this continent is already equipped with an earlier version of this electronic system.

These advances in automatic defense of this continent were revealed by Hughes Aircraft Company in Culver City, Calif., when, for the first time, its electronics plant was opened to reporters.

The system now in use allows pilots to locate and destroy invading aircraft in all weather, day or night, with very high chances of a "kill."

Totally automatic direction of guided missiles by a network of electronic "brains" covering the entire country is the goal of defense planners. Such a system is believed to be the only answer to the intercontinental ballistic missile carrying a hydrogen bomb.

Ideally, it would work like this:

Powerful ground or airborne radars would give the first warning of unidentified aircraft. Information on their location, speed and course would be fed continuously to giant electronic computers.

Using the laws of chance, the computer would decide the most probable target city or cities. It would also decide from which location to fire guided missiles to intercept the attack.

Once in the air, the missile's miniature radar and its own electronic computer — a baby version of the one that launched it — would keep it on an interception course.

Development of such a system is still in the future. But even the jet aircraft that are sent screaming into the air today when radars spot unknown aircraft can be automatically flown and rockets fired without help from the pilot when within 15 miles of target.

Howard Hughes, president of the company, said that to develop and produce the present electronic systems, and other weapons of defense including the Falcon guided missiles, he had gathered the largest privately organized scientific group in the nation working exclusively on electronics for the military.

Science News Letter, October 15, 1955

ELECTRONICS

Atom Power Plant Will Run Much Like Today's

➤ USING ATOMIC ENERGY instead of coal in electrical power plants will change some nomenclature, but the plant will be run in the "old and familiar way."

Operational practices in the nuclear plant will not be markedly different from standard practices today, N. E. Wilson of the Westinghouse Electric Corporation told a meeting of the American Institute of Electrical Engineers in Chicago.

A nuclear power plant of the pressurized water-moderated and water-cooled type may be shut down and returned to service at will.

Approximately one hour is required to start up such a plant and bring it to full power if it is hot at the time of start-up, he said. About three and a half hours are needed if the plant is cold.

The major difference between this plant and a conventional one with respect to shutdown is that radioactive decay of fission products requires provisions for removal of heat for some hours after shutdown.

Science News Letter, October 15, 1955

BACTERIOLOGY

Find New Antibiotic In Pakistan Earth

➤ A NEW ANTIBIOTIC has been discovered in an organism obtained from East Pakistan earth by Drs. K. Ahmad and M. F. Islam of the University of Dacca, East Pakistan.

The antibiotic has been named Ramnacin after the place, Ramna, where the organism producing it was discovered. This organism is a member of the streptomyces family. This is the family of organisms between molds and fungi which also produced one of the first antibiotics, streptomycin.

Ramnacin is a stable antibiotic showing activity against a number of bacteria, including some staphylococcus and streptococcus germs, and a couple of fungi, the scientists report in *Nature* (Oct. 1).

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DISSECTED "BRAIN" — Electronic "seek-and-kill" equipment, like that now installed in all U. S. and Canadian interceptor planes defending the continent against air attack, is displayed. The gear takes over control of the craft 15 miles from target and fires rockets automatically. The display includes as many parts as 200 television sets.

PSYCHIATRY

Unlock Mental Wards

➤ A REVOLUTIONARY MOVEMENT in treatment of mental patients is under way. It is a movement to take the locks off the doors and the bars off the windows of mental hospitals.

In importance it may rank with the 150-year-old milestone in treating mental patients that came when the French doctor, Philippe Pinel, struck the chains off the insane and placed them in hospitals under the care of physicians.

The majority of mental patients, psychiatrists are convinced, would get well faster without the barred windows and locked doors and the attendant with the big bunch of keys who says when the patients are to go through a door.

The bars and locks and the restrictions on the patient's freedom, these psychiatrists say, are archaic.

The vast majority of mental patients, contrary to popular opinion, are not violent. They are more like a bunch of sheep sitting around until someone tells them what to do next.

So long as they are herded by the man or woman with the keys to meals, to exercise, to bed, they are likely to remain more like sheep than like human beings with human minds and desires. They can hardly take responsibility for their actions until they are free to act.

Modern psychiatric treatment aims to help mentally sick patients find themselves again as living human beings. Psychiatrists may give chemical or electric shock or medicines to quiet the disturbed state of some patients and to bring them to a realization of what is going on around them.

But once that has been achieved, the patients must be helped to carry on by themselves, first in the protecting atmosphere of the hospital and then out in the world of family, work and play.

This part of the treatment can hardly be carried on when the patients are kept in the unnatural environment of locked doors and barred windows and completely directed activities.

Just as Pinel risked his own life and liberty when he took the chains off mental patients, so modern psychiatrists and mental hospital superintendents face public opinion that may damage them and their efforts to help their patients.

How to overcome this opinion and how safely to give mental patients greater freedom was the subject of the American Psychiatric Association's Seventh Mental Hospital Institute in Washington.

At the meeting the psychiatrists and superintendents heard of a mental hospital in England where within the year the last lock has been taken off the last door.

Personnel, it was pointed out, is the biggest need for this revolutionary method in treating mental sickness. The patient who wants to commit suicide needs constant attendance and watching while he is learning to use his freedom and to see himself and his problems in a more constructive way.

Some patients brought to the hospital in a very disturbed condition, whom the layman might call violent, need constant attendance and watching for the first few days until they quiet down.

Swimming pools, baseball diamonds, movies and dances can be bigger aids to recovery, the psychiatrists believe, when these are provided in a more natural environment than when they, too, are behind bars and within locked doors and gates that can only be opened by the big fellow with the bunch of keys.

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WILDLIFE

Bombing Range Vetoed

➤ THE WORLD'S LAST BAND of whooping cranes will be safe from military disturbances in their Texas winter quarters.

The U. S. Army Engineer Corps at Galveston, Tex., has vetoed an Air Force plan to extend its Matagordo Island bombing range to within about a half mile of the great birds' sanctuary.

The Air Force's move to take in areas right up to the cranes' winter refuge touched off a storm of criticism that eventually became an international incident, with Canada entering a formal protest to the U. S. State Department. The whooping cranes breed in Canada's remote Northwest Territory.

Wildlife experts feared that nighttime explosions of photoflash bombs the Air Force planned to drop near the whooping crane refuge at Aransas, Texas, would literally scare the handful of remaining birds out of existence and into extinction.

The Army Engineer Corps thumbs down on the expansion ends that threat.

Photoflash bombs go off with a blinding flash of some 15,000,000 to 20,000,000 candle power, visible 100 miles away and accompanied by a sharp, thunderous clap.

The experts' fears were based on sad experience. During World War II, the Air Force was allowed to drop photoflash bombs near the wildlife refuge at Salt Plains, Okla.

Before the first bomb was dropped, there were some 200,000 ducks and 7,500 Canadian geese in the area. It took only the first photoflash bomb to send all the waterfowl in a mad stampede from the refuge.

No more geese were seen there for the rest of the year, and only a few ducks straggled in.

If the whooping cranes — which now number only 21 adults and perhaps six young—were scattered in fear from their protected winter sanctuary, their chances for survival would be greatly reduced.

The Air Force was reported to want the bombing range extended in the neighborhood of the Aransas refuge because of the large number of almost cloudless nights there. At the height of bombing practice, bombs were supposed to be dropped every 20 minutes throughout the night.

Science News Letter, October 15, 1955

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ATOMIC PHYSICS

Unused Elements for Fuel

Materials of little use today may become a vast source of energy in the future. Teams of top scientists today are searching for a way to tap fusion energy.

➤ TODAY'S UNUSED material will become the atomic power sources of the future as soon as the key reaction to the fusion process is found.

The problem in using the nuclear fusion process is to control, to maintain and to confine the lightweight elements in such a way that more useful power can be obtained from their reactions than is expended getting them to react.

The present status of thermonuclear research in the United States was revealed by Chairman Lewis L. Strauss of the U. S. Atomic Energy Commission, along with the fact that research programs on fusion are being conducted in this field at five laboratories.

Scientists at Princeton University, at New York University, at Oak Ridge, Tenn., and at the Atomic Energy Commission's laboratories operated by the University of California at Los Alamos, N. Mex., and at Livermore, Calif., are working on the problem of getting energy from the fusion reaction, the kind of thermonuclear reaction which furnishes the heat of the sun.

Two Atomic Reactions

Two kinds of atomic reactions are potential sources of nuclear energy. The fission reaction, the first of these discovered, powers the atomic bomb made from heavy elements. It acts by splitting the nucleus of the heavy elements, uranium 235 and 233, and plutonium by means of neutrons.

More neutrons are given off when the nucleus splits, sustaining the chain reaction which keep splitting more atoms of the uranium fuel. The reaction proceeds very fast in the atomic bomb, but may be made to proceed slowly in a controlled way in a reactor built to furnish useful power. Such power reactors are just coming into commercial use.

The fusion reaction, which occurs when nuclei of light elements are made to join as in the so-called hydrogen bomb, has not yet been brought to the controlled stage in which it can be made to pay off in useful power, the A.E.C. assures the nation.

Many promising possibilities are being investigated, but the one best way to adapt the fusion reaction, which stokes the stars, to earthly use is still being sought.

Elements at the two ends of the list, available for the two kinds of nuclear reactions, are limited in number. At the heavy end of the list of elements, only thorium and uranium are available in nature for fuel for the fission reaction. Man-made plutonium, one of the A-bomb ingredients, is formed from uranium and is therefore limited by the amount of uranium on earth.

Among light elements, a slightly larger number are possibilities for fuel for the atomic fusion reaction. Hydrogen and helium, the two lightest elements, have been widely suggested as probable fusion elements.

Hydrogen occurs in three forms, including "heavy hydrogen," or deuterium, and the radioactive tritium. Similarly, two isotopic forms of helium are known.

The fact that these light elements are gases would seem to make it difficult to "control, maintain and confine" them as atomic fuel. Hydrogen in any of its three forms could be made more available by combining it with some other element. Helium, since it forms no compounds, would not be capable of this kind of modification.

Next heavier than these are two metallic elements, lithium and beryllium, both theoretically capable of taking part in the fusion reaction. Slightly heavier than these are boron, carbon and nitrogen. Boron is the famous neutron absorber which "scrams" the uranium reactor, absorbing and cutting down the supply of neutrons to stop the chain reaction.

So far as is known, this property would unfit boron to be a possible fuel for the fusion reaction as well. Carbon and nitrogen take part in the fusion reaction in the stars, but do not seem available for peaceful fusion on earth.

For terrestrial reactors the probable fuels are lithium and beryllium. Both are "today's unused materials." Both combine with hydrogen to form salt-like substances, giving the possibility of doubling the fuel-element charge in a fusion reactor. From a chemical standpoint, these two light elements seem most promising.

The A.E.C. is just not discussing them in any way. This makes lithium and beryllium seem even more important in the fusion mystery.

When and if fusion powers the world, it may give atomic power of greater safety than the fission power plants now being built. Neutrons escape when fusion reactions take place, just as they do in fission reactions, but the dangerous radioactive fission products are not paralleled in the reaction fueled by light elements.

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Tropical *cyclones* form only over water.

A mobile *igloo* of lightweight metal, designed for year-round use, will replace all tents in use by Marine aviation.

ELECTRONICS

Ceramic Vacuum Tube For UHF Television

See Front Cover

➤ A KEG-SHAPED ceramic vacuum tube, about the size of a bracelet charm, that is more effective in UHF television sets than any existing tube, has been developed.

The new tube, which may bring ultra-high frequency TV within the range of thousands of heretofore televisionless homes, was unveiled to military representatives in Washington and Fort Monmouth, N. J. Production samples will be available to manufacturers this fall, the General Electric Company said.

Made of ceramic and titanium rings instead of the usual glass bulb, the device has amazing heat resistant properties that suggest its use in jet planes, guided missiles and perhaps man-made satellites. The tube will operate while glowing red hot at 1,000 degrees Fahrenheit, far beyond the temperature at which glass melts.

The ceramic and titanium rings, sealed together, enclose the elements of a conventional vacuum tube.

TV set manufacturers, however, must develop new tuners to take fullest advantage of the improvements in the new tube, shown on the cover of this week's SCIENCE NEWS LETTER.

Science News Letter, October 15, 1955

CHEMISTRY

New Flame Is Found In Chemical Reaction

➤ A NEW kind of flame, orange-red, shaped like a flat disk, and burning without air has been discovered at the department of chemical engineering at Cambridge University, and reported in *Nature* (Oct. 8).

Because methyl nitrite vapor was burned in a large glass tube, this new flame, described as remarkable and unexpected by its discoverers, was seen as a bright cone which peeled away from the base of the grayish-yellow flame burning at the mouth of the tube.

When the rate of flow of the organic chemical vapor burned in the experiment was cut down, the orange-red glow at the base of the flame traveled down the tube, flattened into the disk shape topped with a faint cone-shaped afterglow, and continued to burn although no air could reach it. It continued to burn after the main flame at the mouth of the tube had been blown out.

Describing the odd new flame as due to chemical decomposition of methyl nitrite, Peter Gray of Cambridge University and A. R. Hall and H. G. Wolfhard of the Rocket Propulsion Department, Royal Aircraft Establishment, Westcott, who report the experiment, state that its slow rate of travel down the tube makes it the slowest flame known. Similar chemical reactions have been known to give chemiluminescent glow, but not flame.

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METEOROLOGY

Sun Controls Weather

A working correlation between solar activity and weather on the earth has been found. Daily local forecasts are now being prepared by studying the sun.

➤ DAILY WEATHER FORECASTS are now being made by observing the sun, even when it is not shining locally.

It is the first time scientists have found a correlation between the sun's activity and the earth's weather that works well enough to be used routinely in daily local forecasts.

So far the forecast method has been tried only for the Midwest. But Edwin D. Farthing, the Trans World Airlines meteorologist who first spotted the correlation, told SCIENCE SERVICE he is "quite sure" the effect is "world-wide."

He reported his work using the new solar weather index at the American Meteorological Society meeting in Stillwater, Okla.

The index is an indirect measure of the temperature and density of the solar corona, the sun's giant pearly white halo until recently only visible during an eclipse.

The passage of cold fronts at Kansas City, Mo., Mr. Farthing found, shows a correlation with this index, which indicates the ratio of the strength of the red lines to the green lines of ionized iron in the sun's spectrum.

Changes in the upper atmosphere, including the 200-mile-per-hour current of air known as the jet stream, also seem to be related to the index, Mr. Farthing said. The net westerly flow of air across the United States, on the average, increases when the index is high.

One mechanism suggested to account for the changes is that particles or waves from the sun are absorbed in the high atmosphere on the earth's sunlight side, or cause auroras at the magnetic poles on the night side. This radiation takes only eight minutes to travel the 93,000,000 miles from the sun to the earth.

These particles or waves, and scientists suspect both may be responsible, produce changes in density of the very thin atmosphere found at such high altitudes. Such effects in the high, thin air are somehow transmitted to the lower atmosphere, where the bulk of earth's air is located, but how this happens is still unknown.

The index, or ratio, is computed daily at the High Altitude Observatory, Boulder, Colo. The higher the ratio, the greater the chances of precipitation at Kansas City and the heavier the precipitation, Dr. Farthing has found. Temperatures also rise when the index is high.

On days when the ionized iron lines are strongly emitting, a trough is formed on the West Coast. The movement of this trough changes the flow of upper air above the West Coast, an effect first noticed by Dr. Herbert Riehl of the University of Chicago.

Three days later, a cold front passes Kansas City, Mr. Farthing said. A "quick check" of records of Colombo, Ceylon, showed the "same correlation of high rainfall with high solar activity on the other side of the world, pointing to a broad-scale pattern."

Mr. Farthing said he believed that when all evidence is put together, it will show the earth's weather is directly controlled by the sun, although the delay before the effect is noticed will not be the same everywhere in the world.

Scientists at the Weather Bureau in Washington say they are also studying these effects, particularly as they relate to large-scale weather patterns. They are cautious in commenting, however, since other methods showing direct relationship between solar activity and weather that have looked promising have failed after a few months.

One instrument used at the Boulder observatory is the coronagraph which produces an artificial eclipse by shutting out unwanted light from the sun's surface.

Observations with the coronagraph, made under the direction of Dr. Walter Orr Roberts, the observatory's director, yield the index Mr. Farthing uses.

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ELECTRONICS

Electronic "Brain" Can Help Traffic Problems

➤ IF YOU have lost hope that the human brain can ever cope with the traffic problem, cheer up.

SWAC, the big electronic brain at the University of California at Los Angeles, can be rigged to help solve the highway problems that plague America.

Preliminary studies by D. L. Gerlough of the Institute of Transporation and Traffic Engineering at the University of California at Los Angeles have convinced him that the large scale electronic computer could be effectively used to help solve many freeway as well as other traffic problems of the nation.

Examples of some of the traffic headaches SWAC could be called upon to consider are:

1. How freeway traffic might be diverted when large traffic jams develop as a result of accidents and other incidents.

2. How much the capacity of freeway traffic lanes is increased as the number of lanes is increased.

3. Problems of evacuation of cities during emergencies where rigid control of freeway traffic is required — such as prohibition of passing and strictly enforced maximum and minimum speeds.

4. Specialized signal systems for main thoroughfares.

5. Individual intersection problems. Some problems of this nature have actually been solved in England, utilizing automatic computers.

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MEDICINE

"Bright Future" For Cancer

➤ A "BRIGHT FUTURE of achievement" in stopping cancer was forecast by Dr. Michael B. Shimkin of the National Cancer Institute, Public Health Service, at the meeting of the Coordinators of Cancer Teaching in Bethesda, Md.

He sees this bright future coming from better understanding of the natural history of cancer.

He pointed out, for example, that thanks to cancer research scientists now know there is an average period of 10 years between a curable, non-invasive stage of cancer of the neck of the womb and the stage of invasive cancer of this part of the female reproductive tract. Thanks to new knowledge of cancer cell detection, the early, curable stage can be discovered and the patient saved from developing frank cancer.

The same situation exists for cancer of the prostate gland and probably in many other types of cancer.

Most marked improvement in five-year survival rates have come in cancer of the colon and rectum in both sexes and cancer of the neck of the womb in women, Dr. Shimkin said, quoting figures from a Connecticut study.

That study has been going on since 1935 and covers 75,500 cancer cases in a population of two million for the years 1935 to 1951.

The five-year survival rate, this study showed, improved from 12% for males and 19% for females in the period 1935-1940 to 20% for males and 32% for females in the period 1947-1951. That means almost twice as many patients saved in the later period as compared to the earlier one.

The improvement, Dr. Shimkin said, has not come from earlier diagnosis. It has come in cases of cancer seen after they had developed to the point of easily recognizable, though still localized, cancer.

Less marked improvement in the five-year survival rates appeared for cancers of the prostate, body of the womb and thyroid gland.

There was no improvement in five-year survival rates for cancers of the stomach, esophagus, lungs, ovaries, skin, bone or brain.

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ELECTRONICS

Voice Powers Transmitter

Minute energy in the sound waves of the human voice has been harnessed for the first time to power a midget broadcast radio. The unit fits into a telephone mouthpiece.

➤ THE ARMY has developed a tiny radio transmitter powered by the voice of the sender alone.

The one-and-one-half pound device requires no batteries or external source of power. It is believed to be the first time the minute energy of the human voice has been harnessed for radio broadcasting.

Small enough to fit into a telephone mouthpiece, the experimental set has already transmitted more than 600 feet with the operator speaking in normal tones. With further development, the Army Signal Corps said, the device's range may be increased to a mile.

Communications experts until now doubted that the energy in the natural sound waves of the voice could be tapped to power a radio with useful range. The voice contains so little energy that it would take a crowd of a million persons to create enough energy to light a single 100-watt bulb.

Transistors, pea-sized gadgets akin to the crystals in the old "cat whisker" radios, made the transmitter possible. The transistor can do the job of a vacuum tube, but with far less electricity.

The voice energy could also be stored up during transmission and used to power a tiny receiver, now under development, that is expected to weigh only three ounces. The transmitter and receiver could be combined into a battery-less, portable walkie-talkie set, about half the size and weight of present-day models. Since there would be no batteries to wear out and replace, the unit could be permanently sealed in plastic to keep out dust, dirt and moisture.

Aside from use in short range transmission during combat, such a set could be used in civilian life by newspapermen, football teams, sportsmen, airport ground personnel and firefighters.

The transmitter unit is described as easy to build. It could be produced for only $20.

A unique system converts the voice vibrations to electricity. The operator's talking vibrates a membrane in the transmitter which is linked to a small generator. As he talks, the sender's voice generates the electricity for transmission and is transmitted at the same time.

The broadcast set was developed by George Bryan, engineer for the Signal Corps Engineering Laboratories at Fort Monmouth, N. J.

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PUBLIC HEALTH

See Plague Spreading From Chronic Form

➤ PLAGUE, the dreaded "Black Death" of the Middle Ages, may exist in non-fatal chronic form, contrary to long-standing assumptions of medical science.

Some individuals may be capable of contracting a chronic plague without showing it, and then passing the lethal disease on to others.

Evidence for these possibilities has been obtained by two University of California bacteriologists, Drs. J. P. Ransom and A. P. Krueger, in monkey studies in the Naval Biological Laboratory operated by the University under contract with the Office of Naval Research.

The two scientists exposed 24 monkeys to killing doses of plague organisms. Four of the animals were still alive and apparently recovering 54 days later, long after they should have died.

Analysis of the tissues of the monkeys showed signs characteristic of a chronic, as contrasted to the usual acute, type of plague.

A chronic type of plague, in which the infected individual would not show signs of the disease and would become a carrier, has not been seriously considered before.

In areas of the world where plague still occurs, especially in the Orient, the information may be helpful to public health authorities in dealing with outbreaks.

Science News Letter, October 15, 1955

MEDICINE

Radioiodine Helps in Severe Heart Disease

➤ RADIOACTIVE IODINE treatment has helped patients seriously ill with heart disease, four Los Angeles physicians report.

The patients they treated had either severe angina pectoris or severe congestive heart failure or both. They had not had a recent acute attack of myocardial infarction, or coronary occlusion, such as President Eisenhower suffered.

The radioactive iodine did not cure or change the condition of the heart. But it reduced the activity of the thyroid gland, thus lowering the rate at which all bodily processes went on and this in turn gave the heart less work to do.

Of 94 patients with angina pectoris, 56% had excellent results, 37% good results and only 7% showed no improvement. Of the 78 with congestive failure, 53% had excellent results, 28% good results and 19% showed no improvement. Results were about the same in the smaller group with angina and congestive failure combined, a report to the *Journal of the American Medical Association* (Oct. 1) stated.

Some relief of symptoms with improvement in comfort, ability to care for themselves or to work, and reduction in the amount of drugs required and in dangerous complications were among the benefits patients received.

The radioactive iodine treatment for heart patients was pioneered by Drs. H. L. Blumgart and A. S .Freedberg in Boston in 1947.

The four Los Angeles physicians reporting their experience with it are: Drs. Frederick W. Pobirs, Henry L. Jaffee, Maurice H. Rosenfeld and Laurence J. Stuppy.

Science News Letter, October 15, 1955

NO BATTERIES—Experimental model of a voice-powered radio transmitter is tested by its developer, George Bryan, of the Signal Corps Engineering Laboratories. Notice no wires dangle from the telephone receiver in which the device is installed.

NUTRITION

Vegetables Keep Better Below Zero Degrees

➤ FROZEN VEGETABLES suffer important losses in quality and vitamin content when stored above zero degrees Fahrenheit, research by Dr. N. B. Guerrant, chemist with the Pennsylvania State University College of Agriculture, indicates.

Dr. Guerrant found that the vitamin C (abscorbic acid) content of eight frozen vegetables dropped significantly after only four months storage at 10 degrees Fahrenheit. After 12 months storage at this temperature, the average vitamin C retention of the vegetables was only about 20% of the normal level.

Among food chemists, the amount of vitamin C lost during storage is used as an indicator of change in food quality. Significant decreases of that vitamin in many foods are "associated invariably with or followed by" unfavorable changes like off-color, off-flavor and decreases in firmness, Dr. Guerrant said.

At zero degrees Fahrenheit or less, however, vitamin C retention was much better, and at minus 20 degrees an average of 93% of the pre-storage vitamin C was present in the eight vegetables after 12 months storage.

From 45% to 89% of the vitamin was present in the vegetables stored 12 months at zero degrees.

While there may be some question as to the advantage of storing vegetables at minus 20 degrees over storage at zero degrees because of economic factors, it is obvious that storage of vegetables at ten degrees is not satisfactory even when the period is for only four months, Dr. Guerrant concluded.

Science News Letter, October 15, 1955

AERONAUTICS

Heat Bigger Supersonic Problem 20 Miles Up

➤ SUPERSONIC, high-flying projectiles and rockets apparently will encounter a surprising heat problem not heretofore suspected.

Projectiles traveling at around 760 miles per hour get hotter at high altitudes (above 20 miles) than when flying low, according to research in a University of California wind tunnel.

This is surprising because it has been supposed that the dense air at low altitudes yield heat-producing frictional forces much greater than those in the rarefied atmosphere.

Engineers at Berkeley, Calif., have figured out a plausible answer. They find that the thin air is actually more viscous than air masses at lower altitudes, and that the heat generated by friction in the stratosphere cannot be conducted away as easily. This causes a high-flying object to heat up more than it would at low altitudes.

The findings were made in an unusual wind tunnel that simulates flight at supersonic speeds in the thin air high above the earth.

The wind tunnel is powered by vacuum pumps that suck "thin" air over a model, and in this way reproduce conditions that exist in the stratosphere.

Strange things happen when a tiny model is placed in the supersonic rush of air. Instead of being confronted by a continuous air mass—as would happen at low altitudes—the model is bombarded by bunches of individual air "molecules." Studies of this phenomenon resulted in the findings on heat.

The group of University of California scientists—S. A. Schaaf, D. C. Ipsen, F. S. Sherman, G. J. Maslach and F. C. Hurlbut—reported their findings as they announced the operation of a new and bigger wind tunnel.

The new instrument is four times more powerful than the former model. It will permit the study of objects traveling more than six times the speed of sound, 20 to 80 miles above the earth, higher than man has ever ventured to "fly" in the laboratory.

The wind tunnel is operated at a field station of the College of Engineering at nearby Richmond.

Science News Letter, October 15, 1955

BOTANY

"Green Claw" Chemicals Aid Pale-Looking Plants

➤ PLANTS AND TREES, whose pallor and lack of productivity are caused by an iron deficiency, may be helped by a "green claw" instead of the traditional "green thumb."

Dr. Arthur Wallace, agriculturist at the University of California at Los Angeles, who has pioneered western research on problems of plant anemia (or chlorosis as it is more properly called), says the new compounds of claw-like chemicals may be the answer to chlorosis.

These compounds, known as chelates, are named after the Greek word for claw because of a claw-like chemical structure which literally holds iron atoms tightly in its grasp.

Several years ago in Florida, Dr. Wallace points out, it was found that chelates administered to soil around trees caused pallid fruit trees to become a rich green and increased productivity in several cases.

But the iron in these chelates, which had worked so well in Florida's sandy soil, was not readily absorbed by plants from the alkaline, clay soil of the West. One reason was that the alkalinity of western soil tended to precipitate the iron from the compounds. But there were other complicating factors.

Dr. Wallace and his colleagues recently found that the iron atoms fix to the clay in the soil. Thus plants could not absorb them.

With these clues the chemical industry went to work.

Science News Letter, October 15, 1955

IN SCIEN

ELECTRONICS

European Transformers May Differ From Ours

➤ A SURVEY of electronic fashions reveals that a radically different transformer design will probably dominate the field in Europe.

The new transformers have synthetic resin insulation, H. H. Schwager, of the Schwager-Wood Corp., Portland, Ore., told a meeting of the American Institute of Electrical Engineers in Chicago.

These advantages were listed for the new design: smaller size, complete sealing against dust and insects, elimination of fluid insulation and great resistance to short circuit stresses.

A transformer is a device very widely used to increase or lower the voltage of an electric current.

Since the cast resin is quite different in physical characteristics from the usual transformer insulating materials used in the United States, a new style of transformer has been developed.

It bears little resemblance to those now known.

The greatest revolution in the European transformer design has taken place in the lower voltage transformers intended for indoor use, Mr. Schwager said.

The new transformers have shown a remarkable ability to withstand short circuit stresses, showing no signs of disturbance when surges 500 times the rated current are applied.

Mr. Schwager's paper was based on a year's study of the high voltage switch gear industry in Europe.

Science News Letter, October 15, 1955

MEDICINE

Stop Bad Nose Bleed With Female Hormone

➤ SUCCESS IN stopping bad nose bleeds by injections of estrogen, or female hormone, is reported by Dr. Harold C. Menger of Brooklyn, N. Y., in *The Journal of the American Medical Association* (Oct. 8).

The same female hormone treatment proved successful in stopping bleeding in patients after adenoid operations.

Dr. Menger states he does not know why the treatment works.

He gave it to six nose bleed patients who had been bleeding for three to 72 hours. Other kinds of treatment had not stopped their nose bleeds. In all six patients, the bleeding stopped within 20 minutes to one and one-half hours after injection of the female hormone into a vein.

The same good results were obtained in all 16 patients who bled badly after having adenoids removed.

Science News Letter, October 15, 1955

CE FIELDS

MILITARY TACTICS

Air Force Seeks Dogs For Military Duty

➤ THE U. S. AIR FORCE has started a recruiting campaign for ground troops—with four legs.

Within the next few months the Strategic Air Command and the Continental Air Defense Command will purchase a large number of German shepherd dogs to train for sentry work.

Although almost every large breed of dog was used by the armed forces during the war, the Air Force has decided on German shepherds exclusively, reports Capt. Ralph E. Thomas, veterinarian at the Army Dog Training Center, Fort Carson, Colo.

From war-time experience, the military learned that sporting breeds like setters and spaniels were too apt to dash off hunting game to be useful in scouting patrols. Collies lacked the necessary stamina, Capt. Thomas said, while Doberman pinschers were not satisfactory in either arctic or tropical conditions.

German shepherds, however, meet the three basic requirements for a military dog: 1. They are able to perform all the types of duties demanded of them; 2. they are suitable for service in all climates; and 3. the breed is a common one, so that replacements can easily be found.

The dogs are bought subject to a trial period. They must be 12 to 30 months old, of either sex — though females must have been spayed for at least 120 days. The German shepherds should weigh between 60 and 90 pounds and measure 22 to 28 inches high at the shoulder.

These potential warriors should not be timid, nervous or shy of guns and noise, and should be sound mentally and physically which includes being free from heartworms.

Capt. Thomas makes his report in the *Journal of the American Veterinary Medical Association* (Sept.).

Science News Letter, October 15, 1955

GENERAL SCIENCE

Everest Climber Trains For Polar Exploration

➤ SIR EDMUND HILLARY, conqueror of Mount Everest, will cross the Southern Alps of New Zealand with dog teams twice next year.

The crossings will be part of training for dog teams with New Zealand's Antarctic Expedition in 1957.

Sir Edmund will lead the New Zealand expedition.

The world famous explorer said that he wanted to have the dog team parties as proficient as possible before the expedition left New Zealand.

He expected the expedition to meet the most difficult territory early in its Antarctic journey.

One of the training trips will be from Tasman Glacier to Murchison Glacier. The other will be from Tasman Glacier to Franz Joseph Glacier over the Graham saddle.

Sir Edmund said that the second trip would be worse than anything the expedition was likely to encounter in the Antarctic.

Science News Letter, October 15, 1955

PSYCHIATRY

Hypnotism Should Be Recognized by Law

➤ HYPNOSIS has now come of age and is recognized in medicine and psychiatry. It is time our legal system recognized it and the courts prepared themselves for the inevitable series of judicial decisions that will have to be made concerning it, Sheldon S. Levy, assistant district attorney of New York County, declares in a report to the *Journal of Criminal Law, Criminology and Police Science* (Sept.-Oct.).

Here are some of the practical problems that courts may have to consider in the future:

Can a person be hypnotized against his will? On this question, even authorities differ. The majority, Mr. Levy reports, hold that he can. But a minority—and popular superstition is in agreement—believe that it is impossible.

Once a person has allowed himself to be hypnotized, can he be forced, under the influence of hypnosis, to submit to criminal acts on the part of the hypnotist? This has been claimed in some cases of sexual attack.

Can a person under hypnosis, or by post-hypnotic suggestion, be made to perform a criminal act? What would be the extent of the responsibility of the hypnotized person in such a case? To what extent can the hypnotist be held liable?

Should the testimony of a person who has been hypnotized be accepted in court? And should evidence that a witness has been hypnotized be accepted as affecting the credibility of the witness?

Should admissions and confessions elicited from a person who may have been hypnotized be admitted as evidence in any legal proceeding?

"It should be emphasized," Mr. Levy concludes, "that every case involving hypnosis that occurs should be investigated by competent experts and allowed to take its place before the law on its own merits. Lawyers and judges must adopt a scientific attitude, must desist in the use of antiquated legal thinking in relation to hypnosis, and must acquire the needed enlightenment concerning the phenomena and principles of hypnotism. Only in this manner will scientific advancement secure its rightful position in our courts of law."

Science News Letter, October 15, 1955

GENERAL SCIENCE

New Awards to Include Science Comic Books

➤ NATIONAL AWARDS for films, television, radio, comic books and children's books that are "a source of inspiration and guidance to the youth of America" will be given by the Thomas Alva Edison Foundation as a part of a new program to combat juvenile delinquency.

Based on 1955 production, there will be awards for films, television and radio programs that best portray America, best for children and best in the science category.

For comic books, "recognized as having the same status as other branches of the mass media," prizes of $100 will be given for the best in American history, the best children's comic book and the best science comic book. In books, $250 prizes will be awarded for the best children's biography, the best children's science book and the youth book that best portrays America's past.

Charles Edison, honorary president of the Edison Foundation and former governor of New Jersey, who is the son of the great inventor, in announcing the awards declared that they are intended to encourage the presentation of our country's heroes and ideals "in a manner that will capture the imagination of our boys and girls."

Mr. Edison explained that Thomas Alva Edison had great visions and hopes about the educational possibilities in the mass media, which his discoveries and inventions helped to create, and the Edison Foundation has as one of its objectives the improvement of the quality of mass media.

Helping solve the serious shortage of scientific manpower by interesting young people in careers in science and engineering is another major objective.

Science News Letter, October 15, 1955

VETERINARY MEDICINE

Flu-Like Disease Hits Cattle During Shipment

➤ SHIPPING FEVER, the costly cattle disease that strikes like human influenza, makes the movement of cattle from range to feedlot one of the most dangerous activities in the livestock industry, the American Veterinary Medical Association warns.

The excitement and exhaustion of travel, plus changes in feed, water and climate in transportation, make cattle highly susceptible to this respiratory disease.

Shipping fever comes quickly, leaving the animals with high temperatures and a soft cough.

Appetite wanes, and there is a nasal discharge and watery, reddened eyes. Pneumonia often follows if the animals are not treated in time.

Treatment is usually very effective. The fever may be confused with early stages of other cattle diseases, requiring an accurate diagnosis at the first sign of illness to avoid needless losses, the AVMA said.

Science News Letter, October 15, 1955

PUBLIC SAFETY

Crash-Proofing Drivers

The driver is about to be packaged in his modern car like a delicate vase to keep him sound in a collision. New emphasis on injury-preventers seen.

By EDWARD HOUSMAN

➤ THE AUTO INDUSTRY is selling safety this year.

Manufacturers who have in the past hushed up injury prevention for fear of calling attention to the hazards of the road, thus discouraging buyers, are now beating the drum for safety.

Collapsing steering wheels, padded dashboards, doors that will not open in a collision, shatter-proof rearview mirrors, and padded sun visors are now proudly displayed in the showroom. For the first time, the three major auto manufacturers are offering safety belts as an optional feature.

The car's interior, which has been studded with dangerous surfaces, is being turned into a padded "package" that shows great promise of reducing the terrific maiming and slaughter toll on the nation's highways.

Emphasis on the "packaged passenger" is new. In the past the stress in safety has been ease of control to avoid accidents. But accidents are still happening and at about the same rate as before.

Egg Will Not Crack

Safety engineers have developed a dashboard padding for the 1956 cars so energy absorbing that when they drop an egg on it from eight feet, the shell will not smash or even crack.

On a small scale, a raw egg is very much like the human head in crash resistant properties. The shell is roughly similar to the skull and the watery insides react somewhat like the brains.

The padding withdraws under an impact, presenting a large surface that takes up the energy of the fall. This type of padding is many times more effective than foam rubber, which punches back as soon as it is hit. The padding gives way under a blow, retains the depression for a moment, then slowly returns to shape.

You can pound it hard with your fist without hurting your knuckles.

With such padding on the dashboard and on the sun visors, and with a safety belt, a passenger in the "death seat" next to the driver could come through a severe accident with only minor injuries instead of a cracked skull and shattered bones.

A padded dashboard, however, does not protect the driver from his greatest crash hazard, the steering wheel. It is right in the path of his chest in a collision. When the rim gives way the steering post can lance him in the chest. The seriousness of the danger is shown in the fact that 40% of injured drivers are hurt by the steering assembly.

One answer is a bowl-shaped wheel with the steering column deep down. If the driver hits, the collapsing rim would take up the brunt of the energy.

Such a steering wheel has been developed and is standard equipment in 1956 Ford products.

The ultimate solution to the steering wheel problem, safety experts feel, may be to do away with the wheel altogether, substituting a steering lever, or joy stick, similar to those used in airplanes. It would be at the driver's side, out of the way during a crash.

Tucking protruding surfaces, like knobs and buttons, into a safe corner is a must for the "dream safety car" of the future envisioned by safety experts at Cornell Aeronautical Laboratory, Buffalo, N. Y. When a passenger's head hits a knob, the protrusion concentrates the energy of the blow on a single spot. This could puncture the skull. If the surface were smooth and padded, the blow might be harmless.

In the new drive for crash safety, Ford Motor Company is providing its safety engineers with cars right off the assembly line as fast as the engineers can crack them up in their experiments.

Proposed safety equipment is tested in the crack-ups with lifelike dummies subbing for passengers. The two star dummies, Ferd I and Ferd II, have electronic instruments in their bodies that transmit to recording equipment outside the car how they "felt" during the crash and how badly they were "hurt." A slow motion camera also watches their movements during the crack-up.

The dummies have steel skeletons. Their bodies are covered with a tough plastic simulating muscle and a softer plastic simulating skin. Joints can be made either rigid or limp.

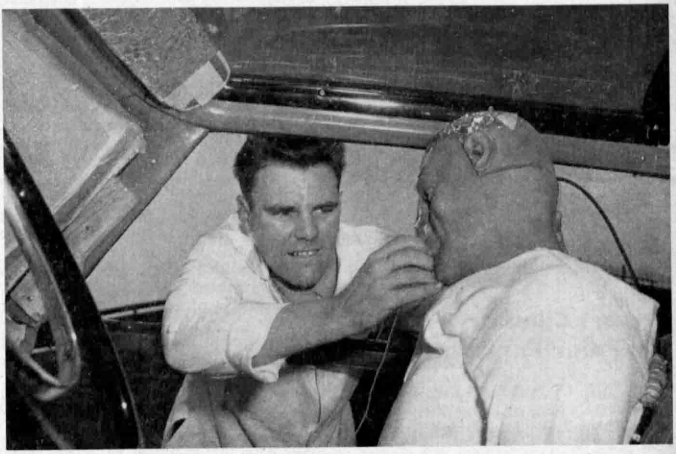
The Ferd brothers have proved to the satisfaction of safety engineers that the safety belt is perhaps the most valuable injury-preventer available.

A delicate vase, when properly packaged, will not break even with rough handling because it is not only padded, but is also restrained in place so it will not jostle about or be thrown against the padding with force.

The same holds true for the "packaged passenger." He would be many times safer if he were strapped to his seat.

There are mixed reactions among safety

Continued on p. 252



PREPARING FOR CRASH—A lifelike dummy is readied for a collision in a brand new car with safety features built in. The dummy's brain case is packed with instruments that tell engineers how badly a person would have been injured had he been in the dummy's place. A Ford Motor Company technician adjusts the connection to a patch of aluminum foil on the dummy's head.

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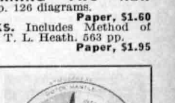

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61	62	63	64	65	66	67	68	69	70

Crash-Proofing Drivers

Continued from p. 250

experts about how the public will take to the safety belt being offered now. But they agree on the safety value of the belt.

The ideal seat belt would hold the passenger snugly against the seat at the waist and at both shoulders. Designers, however, feel that there is a limit to what the public will accept. Drivers will certainly not allow themselves to be bound completely into the seat.

The sturdy lap belts now being offered are a compromise. They will hold the passenger in his seat and prevent him from hitting the dashboard with anything like the same force as the unrestrained person. There are no shoulder supports and the body will tend to jacknife during a collision. A seat-belted passenger will rarely hit the windshield.

Contrast this safety-packaged person with the unrestrained passenger in an ordinary car. He would be thrown completely from his seat into the windshield with his knees and stomach striking the dashboard. If in the back seat, he would be thrown over the front seat head first into the first hard surface.

Being thrown from the car, even when it it not padded, doubles the risk of serious injury. Persons thrown from opening doors during a crash can expect to get hurt twice, once against the car and once against the road surface or the other car. Seat belts prevent passengers from being thrown through opening doors.

In addition, safety door latches are available in 1956 cars. Several new schemes to give even more assurance that doors will not pop open are now being considered. In one system, like that used on some airplanes, the door would be triple bolted to the frame.

One big danger with the safety belt is that it might be over-sold as a cure-all, many safety experts feel. The driver might say: "Well, now that I'm strapped in, I can really turn on the gas."

Safety experts laugh at, and at the same time fear, this attitude.

Another danger is that an unscrupulous manufacturer might put out belts that would have just about as much restraining force as cheesecloth in a collision.

The belts now being offered by the auto manufacturers are of high quality. Some are even stronger than those used in airplanes.

Urge Belt Standard

But in anticipation of the many different types of belts that may come on the market, some of which might look very much alike, safety experts are urging an industry-wide standard for them.

Initial studies toward this end are being pushed in the American Standards Association. A standard method to anchor the belt is also under study.

Whether the safety belt works or fails will depend not on its performance as a safety factor, but upon whether the public will use it.

This is the view of Donald S. Buck, safety director of the Army Transportation Corps. There is no question about their value as a safety aid.

Irreparable harm, he said, could be done by antagonizing drivers or by making them install belts in their cars.

The belt should be acceptable to the driver naturally and he should soon get so used to using it that he would feel insecure without fastening it.

The Army is considering a plan to run a large-scale test among civilian and military drivers with different seat belt designs. The driver would be asked to use the belt for a month and after that time answer two questions:

1. Is the habit pattern formed to the extent that you feel insecure when not wearing the belt?
2. What are your criticisms of the belt?

This type of test would give the manufacturers an idea which belts would be accepted and used and a way to weed out those that would be installed but not used.

The safety belt, Mr. Buck feels, is only an interim device. They are crude looking.

Ultimately, perhaps in two or three years, a safety shielding device to replace the belt will be built right into the dashboard. This shock absorber could be pulled against the waist. It would be good-looking, comfortable, and easy to use.

Science News Letter, October 15, 1955

In the past three years, between 35,000 and 38,000 persons have been killed each year and 1,500,000 to 2,000,000 persons have been injured annually in automobile *accidents* in the United States.

ASTRONOMY

Sun's Radiation Varies Over Disk

➤ THE SUN appears to the eye to have the same brightness everywhere, but actually its radiation in the extreme ultraviolet does vary over the surface.

The sun is brighter at the edges near its equator than at the edges near the poles, Dr. C. M. Minnis of the Radio Research Station, Ditton Park, Slough, England, reports in *Nature* (Oct. 1).

"The permanent uniform disk radiation contributes 96% of the total" solar radiation in the extreme ultraviolet, Dr. Minnis concluded from his studies of how the radio reflecting layers of the atmosphere change during an eclipse.

Science News Letter, October 15, 1955

Do You Know?

Storm damage in this country in 1954 exceeded $6,000,000.

One out of every two new *cars* sold is in a serious accident at some time during its lifetime.

The icebreaker U.S.S. Westwind can cut out a large *iceberg* and nose it over to shore to furnish fresh water for northern land bases.

The aircraft carrier U.S.S. Saratoga's propulsion equipment can develop over 200,000 horsepower—more than that of any *ship* built, including her sister ship, the U.S.S. Forrestal, and the luxury liner, the S.S. United States.

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

AIR-BORNE—Verne N. Rockcastle—*New York State College of Agriculture,* Cornell Rural School Leaflet, 32 p., illus., paper, 20 cents. Written for children about the seeds, pollen, birds, animals and insects, as well as soil particles, that travel on the wind.

ALL ABOUT BIRDS—Robert S. Lemmon—*Random House,* 142 p., illus., $1.95. Introducing children to the bird's world—where it lives, how it flies, why it migrates.

AMERICAN FOUNDATIONS AND THEIR FIELDS—Wilmer Shields Rich—*American Foundations Information Service,* 7th ed., 744 p., $35.00. Listing some 4,164 foundations together with their interests and financial assets.

ATOMIC WEAPONS AND ARMIES—Lieut.-Colonel F. O. Miksche—*Praeger,* 222 p., illus., $5.00. A French officer raises military problems of the future and attempts answers to them.

EXPERIENCES WITH MY COCKATIELS—Mrs. E. L. Moon—*All-Pets,* 112 p., illus., paper, $2.00. Information on care, breeding and health of these birds.

CONSUMER BEHAVIOR: Volume II, The Life Cycle and Consumer Behavior—Lincoln H. Clark, Ed.—*New York University Press,* sponsored by Consumer Behavior, Incorporated, 125 p., illus., $5.00. How buying changes during life from the consumption of baby food to investment in Florida real estate.

EFFICIENCY AND SELECTIVITY OF COMMERCIAL FISHING DEVICES USED ON THE MISSISSIPPI RIVER—William C. Starrett and Paul G. Barnickol—*Illinois Natural History Survey,* Bulletin, Volume 26, Art. 4, 42 p., illus., paper, limited number free upon request direct to publisher, 172 Natural Resources Building, Urbana, Ill. Report of a survey of commercial fishing in 1944 and 1946.

EXPERIMENTAL PLANES: Subsonic and Supersonic—R. Frank, Jr.—*Crowell,* 146 p., illus., $2.50. A child's book about new types of aircraft.

FORAMINIFERA FROM THE ARCTIC SLOPE OF ALASKA: Part 2, Jurassic Foraminifera—Helen Tappan—*Govt. Printing Office,* 90 p., 21 plates, paper, $1.50. Material described was obtained during the field exploration and drilling program of the U. S. Navy. The U. S. Geological Survey cooperated.

GEOLOGY OF OLYMPIC NATIONAL PARK—Wilbert R. Danner—*University of Washington Press in cooperation with the Olympic Natural History Association,* 68 p., illus., paper, $1.25. A beautifully illustrated booklet intended especially for park visitors.

GREAT DISCOVERERS IN MODERN SCIENCE—Patrick Pringle—*Roy,* 206 p., illus., $3.00. Biographies of noted scientists written for young people.

HANDBOOK FOR TEACHING OF CONSERVATION AND RESOURCE USE—Richard L. Weaver—*National Conservation Committee, National Association of Biology Teachers and American Nature Association,* 499 p., illus., $4.00. Result of a 4-year study of aids to teachers in this field.

IMAGINATION'S OTHER PLACE: Poems of Science and Mathematics—Helen Plotz, Compiler—*Crowell,* 200 p., illus., $3.50. An unusual collection of poems about sciences and about scientists.

INSTRUMENTS FOR MEASUREMENT AND CONTROL—Werner G. Holzbock—*Reinhold,* 371 p., illus., $10.00. Describing instruments commonly used for remote reading or remote automatic action in the industrial plant.

KARL PATTERSON SCHMIDT ANNIVERSARY VOLUME: In Honor of His Sixty-Fifth Birthday—*Chicago Natural History Museum,* Fieldiana: Zoology, Volume 37, 728 p., illus., paper, $10.00. Twenty-eight scientists contribute papers to this volume.

LUCKY YOU—Munro Leaf—*Lippincott,* 48 p., illus., with drawings by the author, $2.25. A book for small children about what science has done to make our lives more comfortable.

MAKING THINGS OF PLASTIC—Lauton Edwards—*Chas. A. Bennett*—191 p., illus., $3.75. Instructions and illustrations showing how to make useful and ornamental objects for the home.

MEDICAL AND PSYCHOLOGICAL TEAMWORK IN THE CARE OF THE CHRONICALLY ILL—Molly Harrower, Ed.—*Charles C. Thomas,* 232 p., illus., $5.75. Proceedings of a conference of internists, psychiatrists and clinical psychologists, held at Galveston, Texas.

THE MOBILE MANUAL FOR RADIO AMATEURS—Headquarters Staff—*American Radio Relay League,* 352 p., illus., paper, $2.50, plus postage. A reference book for the "ham" interested in mobile radio and a text for the newcomer to the field.

MODERN GAS ANALYSIS—Paul W. Mullen—*Interscience,* 354 p., illus., $5.50. For the student or industrial chemist who wants to know about available methods of gas analysis.

MODERN HOMESTEADERS: The Life of a Twentieth-Century Frontier Community—Evon Z. Vogt—*Belknap Press of Harvard University Press,* 232 p., illus., $4.25. An anthropologist who himself lived in Homestead, describes the growth and decline of this modern-day frontier community.

NATIONAL RESEARCH COUNCIL OF CANADA ANNUAL REPORT—E. W. R. Steacie, President—*National Research Council of Canada,* 44 p., paper, free upon request direct to publisher, Ottawa, Canada. Intended to inform the general reader about the research program of this agency. In French and English.

SUMMARY OF SURVEY OF PHILANTHROPIC FOUNDATIONS: Excerpted from American Foundations and Their Fields, 7th ed.—Wilmer Shields Rich—*American Foundations Information Service,* 32 p., paper, free upon request direct to publisher, 860 Broadway, New York 3, N. Y., mentioning Science News Letter.

YOU AND YOUR CHILD—Winifred De Kok—*Philosophical Library,* 147 p., $3.75. Advice for parents and parents-to-be.

Science News Letter, October 15, 1955

Questions

AERONAUTICS — Why would heat be a greater problem to supersonic aircraft at very high altitudes? p. 248.

□ □ □

BACTERIOLOGY—What is the name of the new antibiotic found in Pakistan soil? p. 243.

□ □ □

ELECTRONICS—How many persons would be needed to generate enough voice energy to light a 100-watt bulb? p. 247.

□ □ □

METEOROLOGY—How is the sun believed to control the earth's weather? p. 246.

□ □ □

PSYCHIATRY—Why do doctors advise unlocking mental wards? p. 244.

□ □ □

Photographs: Cover, General Electric Company; p. 243, Carl Byoir & Associates, Inc.; p. 247, Army Signal Corps; p. 250, Ford Motor Company; p. 256, Bakelite Company.

ZOOLOGY

NATURE RAMBLINGS

by Horace Loftin

Roguish Raccoon

➤ THE RACCOON is a rogue, and nothing suits him better than the black mask that surrounds his bright, intelligent eyes. Still, like many rogues, he is such a lovable character that it is easy to forget his shortcomings.

He will eat almost anything from beetles to chickens. That fact, plus his monkey-like curiosity, is what keeps him in trouble.

The 'coon is a creature of the night, when the darkness hides his marauding expeditions into some helpless squirrel family's nest or into the farmer's chicken house. Unfortunately, he does not limit himself to what he needs when he steals into a chicken house, but carries out a needless slaughter.

Generally a sly animal, greediness makes him incautious, and he will follow up a successful raid on chickens by returning night after night — until he pays the farmer back by furnishing a fine 'coon hide for the barn door.

But not to paint his picture all in black, the raccoon actually gets most of his food in the wilds and is not considerd a harmful predator. Among the chief items in his diet are crayfish, which he obtains only by industrious digging on the bank of a stream. He also relishes wild honey, which —like his distant relatives, the bears—he gets at the cost of many a sting.

'Coons seem to prefer to wash their food in water before eating it, which fact is preserved in their scientific name *Procyon lotor,* which roughly translated means the "washing 'coon." However, this seems not to be a hard and fast rule, and a raccoon will eat without washing his food if he has to.

On the prowl, the 'coon noses about wet places from choice, along the borders of streams and in the paths of animals leading to their watering spots. He seems unable to resist mounting and running along every fallen tree that crosses his path. This trait appears to be so universal that raccoon trappers often place steel traps on fallen logs, without any bait whatever, knowing their prey will scamper over it if he passes by.

If you chop down a 'coon tree, you are apt to find several of them at home, for they are family animals. Mother raccoons have from three to six young, usually born in April or May. They are blind and completely helpless for about three weeks, and both parents look after them then and all through their first season. During the winter sleep, the entire family may curl up together in the same old hollow tree.

Science News Letter, October 15, 1955

The tremendous quantity of original *scientific work* published each year—about a million articles in 50,000 specialized reviews for the natural sciences alone—has made it essential to publish international bulletins of abstracts.

New Machines and Gadgets

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE SERVICE, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 800. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

FROST SPRAY for coating windows comes in an aerosol container. Useful for reducing glare and insuring privacy, the spray-on-frost simulates ground glass. It drys quickly and is permanent. The frosted glass can be washed.

Science News Letter, October 15, 1955

WELDING GUN has a pistol-grip stock. It is molded of glass-filled phenolic resins and welds steel studs up to one and one-quarter inches in diameter in the field. Studs are welded in a split second. The gun also welds studs up to a yard long.

Science News Letter, October 15, 1955

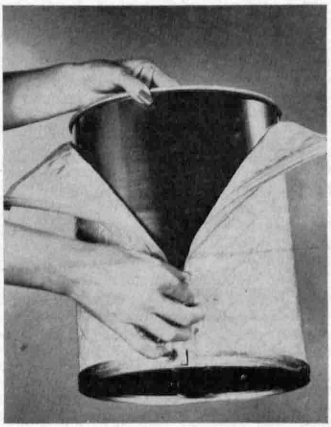
COFFEE PERCOLATOR can substitute for breakfast maker and a before-breakfast water heater for shaving. Imported from Germany, the all-purpose percolator operates on AC or DC and is designed for the traveler. Removal of the percolating unit permits egg-boiling. Removal of the heating coil allows it to be used as a water heater.

Science News Letter, October 15, 1955

SPORTSMEN'S TELESCOPE for bird watchers, star gazers and outdoorsmen has a turrent adapter for mounting of three eyepieces of variable power. It also has a device to hold the 'scope on an auto window or tripod and a twin mount for aligning two of the telescopes to make binoculars.

Science News Letter, October 15, 1955

WASTE BASKET has a removable cover of moire protected by a layer of transparent plastic. Designed for the busy housewife, the plastic can be easily washed and the entire cover can be unzipped from the basket, as shown in the photograph. The



covers come in quilted or unquilted moire, and are available in nine colors.

Science News Letter, October 15, 1955

HAND-HELD VIEWER for 35 mm picture slides has a dual lens system that gives an area magnification of nine times at a distance of 18 inches from the eyes. Two persons at a time can now view a slide through the two and one-half by three and one-half viewing windows. The plastic housing is six inches long.

Science News Letter, October 15, 1955

WATERLESS SKIN CLEANER comes in a plastic bag that serves both as a dispenser and storage container. Enough cleaner to either fill a mechanical dispenser or to clean a worker's hands can be squeezed from the moisture proof plastic bag without any waste.

Science News Letter, October 15, 1955

PLASTIC FABRIC is described as the only product of its kind for wrapping coils, transformers, motors and other electrical products. Available in calipers from 6.5 to 9.5 mils in 36-yard lengths, and widths up to 44 inches, the polyester web is non-woven. It has good varnish "pickup" and moisture resistance.

Science News Letter, October 15, 1955