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SCIENCE NEWS LETTER

Vol. 50, No. 14

THE WEEKLY SUMMARY OF CURRENT SCIENCE • OCTOBER 5, 1946

Bikini Goat

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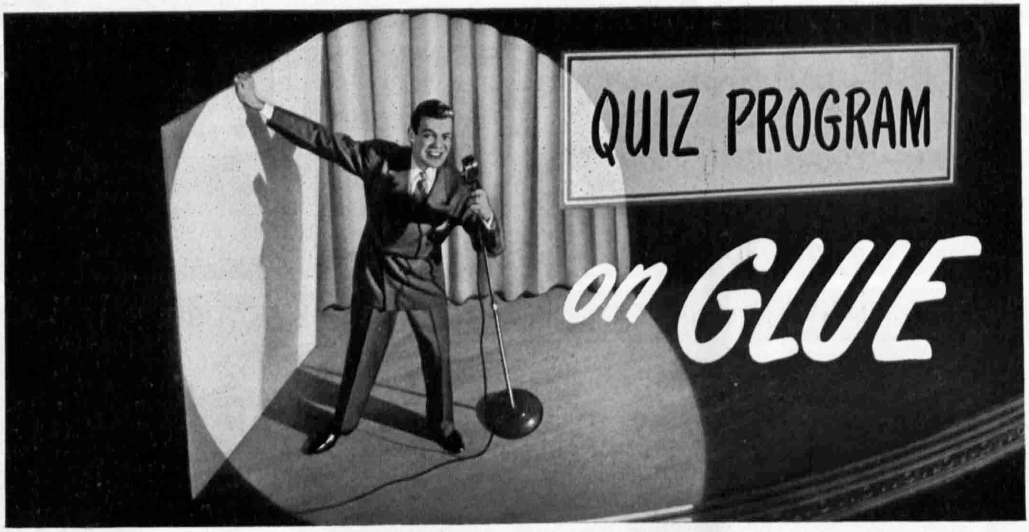
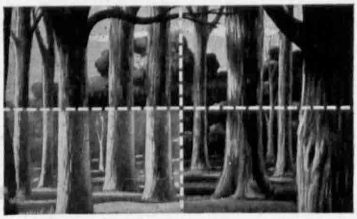


If you've thought of glue only as an evil-smelling substance which the "fix-it man" uses for minor household repairs . . . think again. Come, join our 5-minute Quiz Program!

Research-developed glues — products of Monsanto Chemistry — serve you in far more ways than you may suspect. They bond into a single, rugged pane the three-decker "sandwiches" of wood and glue that you know and use as plywood . . . and they can hold together not merely your kitchen chair, but also vital parts of your new home, your private plane, your pleasure boat, scores of new and better products you'll own tomorrow.

DO YOU KNOW? In a year, plywood made with Monsanto glues could form a "ribbon" four feet wide and three-ply thick, circling the globe nearly twice. World's biggest plywood glue producer is Monsanto's subsidiary, I. F. Laucks, Inc., "America's Glue Headquarters."



DO YOU KNOW? Modern glues make possible the salvage of one-fourth of our salable forest resources which would otherwise be wasted. Scrap timber which formerly went to the burners now goes to the glue room in modern mills . . . is edge-glued, patched or jointed into first-grade stock, stronger than the equivalent one-piece material.

DO YOU KNOW? In at least *twenty* places the modern glue gun can replace the old hammer-and-nails method in building construction, laying a ribbon of glue silently and swiftly. Sketches above show how walls of plywood (*glued*, not nailed to studding) provide modern prefabricated or plasterless construction with speed and economy—8.6 times stronger than conventional walls.

What's YOUR Problem?

If you make *anything* which has to be assembled, why not check up on the possibilities of a glue "tailored" to your exact needs. Inquire at "America's Glue Headquarters" . . . I. F. Laucks, Inc., Seattle, Washington, or the Laucks or Monsanto sales office nearest you. And remember, construction and plywood glues are only a few of the many hundreds of chemical and plastics products made by Monsanto Chemical Company.

SERVING INDUSTRY . . . WHICH SERVES MANKIND

MONSANTO
CHEMICALS for PLASTICS

NOBELISTS AT PRINCETON—When Princeton University opened with nuclear physics sessions, an academic year of bicentennial observance, looking forward to its third hundred years, 12 Nobel prize winners were present. The five shown in this photograph are (left to right): Dr. Arthur Compton, president of Washington University; Dr. Niels Bohr, Danish physicist; Mme. Irene Curie-Joliot of Paris; Prof. Manne Siegbahn of Stockholm and Prof. P. A. M. Dirac of University of Cambridge, England.

PHYSICS

Princeton Bicentennial

Scientists discuss new explanation of the interaction of light and electrons. Such theories may lead to greater understanding of cosmic rays.

Princeton's bicentennial conferences are notable events and highlights of the first two are presented in this issue.

➤ A NEW explanation of science's most fundamental relationship, the way in which light interacts with electrons, the particles of electricity, was presented to the world when Dr. P. A. M. Dirac of the University of Cambridge, England, spoke at the Princeton Bicentennial Conference on Nuclear Science.

Dr. Dirac told how a combination of Einstein's special relativity theory and the Heisenberg uncertainty principle gives hope of explaining the way in which two electrons get together by passing between them a bundle of light that scientists call a photon.

In his audience of about 50 was Dr. Niels Bohr, the Danish atomic scientist, as well as other world leaders in atomic studies.

Despite the world-shaking consequences of atomic physics, scientists have not been able to figure out vigorously and precisely the relationship of two electrons, the smallest bits of matter, even when only the simplest and most classical conceptions are included.

Dr. Dirac explained that his latest solutions of what is called "the quantum theory of electrodynamics" give mathematical results that predict what is discovered by experiments without resorting to arbitrary rules in the mathematical developments.

Such complex equations may seem theoretical and remote, but in them there may be the beginnings of new understanding of cosmic rays, of interplay between the constituents of atoms of new phenomena that promise new industries and new weapons for the future.

The importance of having a good method of solving what happens when two electrons interact extends far beyond this simple case. It is the first step to understanding what happens when the cores of two atoms interact. The clash of atomic nuclei powers an immense amount of human endeavor including atomic energy.

By use of analogy, with a dash of intuition, the theory concerning simple electrons is being applied to atomic hearts to explain their interaction. Just as packets of light are connections to the electrons, there is a possibility that the meson particles discovered in cosmic rays are the means of interchange between the constituents of atomic nuclei.

The idea that there are regions of the universe very close to the cores of atoms where rules that are good in the larger spaces outside do not apply was recalled into the scheme of things by Dr. Dirac. This is a sort of "two worlds" type of physics that seems to be necessary to make theory work and most physicists are no more happy about it than the advocates of one world in the present international situation.

As stated by Dr. R. P. Feynman, young theoretical physicist from Cornell, who discussed the Dirac paper, studies of the cosmic rays being pushed by V-2 rockets and B-29 flights promise to give facts that can be applied to deciding what mathematical pictures of the atomic world are correct. From new experimental high voltage generators being built in several American laboratories, more information will be obtained. They will duplicate the energies of the cosmic rays under experimental control.

The new 184-inch cyclotron at the University of California will also make possible the discovery of many more artificially radioactive isotopes of chemical elements in addition to the 450 now known. Dr. Glenn T. Seaborg, discoverer of the atomic bomb element, plutonium, told the conference this new atom smasher, to begin operating this fall, will generate heavy hydrogen particles of 200,000,000 electron volts and helium ions of 400,000,000 electron volts.

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GENERAL SCIENCE

Research Must Be Free For Scientific Progress

➤ FREEDOM to do scientific research and tell the world about it is an appealing ideal difficult to achieve, to judge by the conversation and papers during the three days of the Princeton Conference on Nuclear Science.

Leaders in atomic bomb research have found that because the National Atomic Energy Commission has not yet been appointed the lid is more firmly closed on fission research than at any time since shortly after V-J Day. The law passed by Congress put all new researches under wraps, with severe penalties, unless the commission exempts them specifically.

The situation will be relieved without doubt when the commission organizes, but for the present even some of the close cooperation with the British scientists within the Manhattan Atom Bomb Project has had to be suspended since Aug. 1.

Some scientists expressed considerable worry over the large amounts of money being given universities by the Navy and War Departments for research, even in fields somewhat remote from war

weapons. There are no formal strings on much of this money, but some fear the implied obligations may be hampering.

Many agreed with the only woman scientist among the delegates, Mme. Irene Curie-Joliot, who with her husband and with her winner of the Nobel Prize, dominates France's atomic energy commission. Mme. Curie-Joliot expressed doubt that it would be possible to teach students and work in a university if any of the work done had to be kept a state secret.

Control of science by some central authority is another great fear expressed. The war brought severe control of research applied to war needs in this country, and Soviet Russia is always cited as an example of state planning in science.

One of the two Russians at the conference, Dr. M. G. Mescheryskov of the Leningrad Radium Institute, stressed in an impromptu statement that "creative processes are understood throughout the world to be free and independent." He felt that the existence of a common philosophy of nature, equally correct in Russia, China, England or the United States, was a hopeful, unifying sign. To pit Russian ideology against Western ideology on the question of freedom of science is without factual foundation, he argued.

Freedom for each scientist to work on any problem he desires was justified by Prof. M. Polanyi of the University of Manchester, England, on the grounds that this is the most efficient method. No important investigation would be neglected, he suggested, and new scientific knowledge would grow at the fastest possible rate, provided everyone told what he discovered.

Directors of industrial research laboratories, Dr. C. E. K. Mees of the Eastman Kodak Company stated, find that at least a partial freedom of science within their walls pays research dividends. Scientists given their head are more productive of new and fundamental ideas.

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GENERAL SCIENCE

Science Guides Thinking

Ideas should be connected with science to solve international problems without another World War. Scientific method is of use in all fields.

➤ BY CHANGING our thinking about economics, politics, religion and ethics so as to connect them with scientific knowledge and methods, it might be possible to bring Soviet and American philosophies together and prevent another World War, Dr. F. S. C. Northrop, Yale philosopher and author of "The Meeting of the East and West," told the Nuclear Physics Conference of the Princeton Bicentennial.

Classical democracy such as rules the British-American world today, Dr. Northrop explained, goes back to the ideas rising out of Kant's philosophy based on Galileo and Newton, which separated science and man. This abstract hot-house brand of moral philosophy argued that science could solve none of the problems of man.

Ideas more nearly related to the Greek conceptions are favored by Dr. Northrop, who said that our present needs for controlling atomic energy and other technological developments can only be met by "a humanism rooted in the ideas of verified scientific theory and sensitive to the possibilities and inevitabilities which the application of this scientific theory bring."

Dr. Northrop would take scientific theory, arising out of deductions connected with experiments, and combine it with the basic methods of logical analysis in science to provide concepts of use in all fields of human endeavor.

This would tell what is right in law, good and divine in morality and religion, useful and effective in economics and politics as well as give a means of controlling science, including atomic energy, to good social ends.

In such ideas as Dr. Northrop proposes there may be an approach to the highly explosive dilemma in the international situation. The basic ideology of communism which controls much Soviet thinking and action could be adapted to evolve into a scientific humanism. If, in turn, our scientists and diplomats could modify their viewpoints and basic modes of thinking and conduct to conform with the new science-grounded philosophy, they might be able to join in a philosophical or ideas conference that would achieve a satisfactory code of international conduct. There might come as a result control of the atomic bomb and world affairs without another war.

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INVENTION

Ultraviolet Lamp Sterilizes Air

➤ AN ULTRAVIOLET lamp for sterilizing the air in food display cabinets, and at the same time illuminating them, is covered by patent 2,407,379, issued to Walter B. Morehouse of Auburndale, Mass. A part of the tube is coated with a phosphor, to be excited to luminescence by the bactericidal rays.

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PHYSIOLOGY

Bikini Ark Returns

USS Burleson brings animal survivors for study of the effects of exposure to atomic radiations. Blood transfusions and penicillin are best combatants.

See Front Cover

➤ DETAILED data on the biological effects of atom-bomb radioacivity, and on medical means developed for combating them, will be kept as military secrets, Vice-Adm. W. H. P. Blandy stated in response to a question at a press conference held on board the USS Burleson, with the animal survivors of the Bikini tests aboard.

There is no objection, he added, to disclosure of general results, which he and other officers discussed freely. The prime reason for exposing animals to the deadly effects of the two bombs, Adm. Blandy emphasized, was to obtain information useful to physicians; there was no "pure science" objective at all.

Best Combatants

Best known means for combating bad after-effects of exposure to atomic radiations are blood transfusions and penicillin, stated Capt. R. Harold Draeger, who was in charge of all animal experimentation at Bikini. A Bikini goat taking a transfusion is shown on the cover of this SCIENCE NEWS LETTER. These are to offset anemia and combat infection. There is no way yet known to attack the direct results of the harmful irradiation.

Sterility due to radioactive effects of the bombs on the animals remains somewhat of a moot point. The sex glands of some of the male animals exposed to the rays seem to have become somewhat atrophied. On the other hand, mice that were in the outer part of the test area, but still within range of the rays, have been actively reproducing.

One result of an all-out atom-bomb war might be to leave a world populated with rats and insects. For rats are considerably more resistant than humans to the deadly radiations that are perhaps the worst feature of atomic explosions. Insects are even more resistant than rats, stated Capt. Draeger.

As a matter of fact, rats were deliberately chosen for most of the tests for that very reason, Capt. Draeger explained. The Navy's medical men wanted animals that were more resistant to radioactivity than men, as well as some that were about on the human level, and some that were less so. The goats and pigs had approximately the same sensitivity as man; the guinea pigs were somewhat more susceptible to the evil-working rays.

Insects were not included among the test animals, but researches on them in the past have shown that they are able to survive from 20 to 40 times the dosage of destructive radiation that will kill a man.

Except for the effects of the bombs' radiations, the mice, rats, guinea pigs, goats and pigs that made the Burleson into a scientific Noah's Ark have an excellent record for health. There were no epidemic diseases among them, and they did not become seasick even when some of their two-legged fellow-voyagers did.

When they had to be left alone on the target ships for several days, food and water were left with them. This was something of a problem in the case of the pigs, because of the chance that they might "make hogs of themselves" and eat everything on the first day. A solution was found, however, by making V-shaped feeding racks with slots just wide enough to admit the end of a snout. These racks were filled with alternating layers of alfalfa hay and grain. With this setup the pigs really had to work for their meals, and did not overeat.

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TEST RAT—Blood oozing from a little nick in this white rat's tail will be collected and used in estimating the effects of the atom-bomb's radiations on the animal's blood-forming tissues. A second rat, on scale at left, awaits his turn.

PHYSICS

New Fire, Smoke Detector Makes Use of Ionization

➤ A NEW type of fire or smoke detector is offered for patent 2,408,051 by K. O. Donelian, of New York. Instead of depending on visual or photoelectric detection of smoke, as in existing instruments, he takes advantage of the fact that a large proportion of the particles produced by combustion carry electric charges, by flowing air drawn through ducts from the spaces to be watched past a pair of electrodes, and registering significant changes of potential. Because some smoke particles are uncharged, he adds a third electrode, plus a small mass of some radioactive material, to impart charges.

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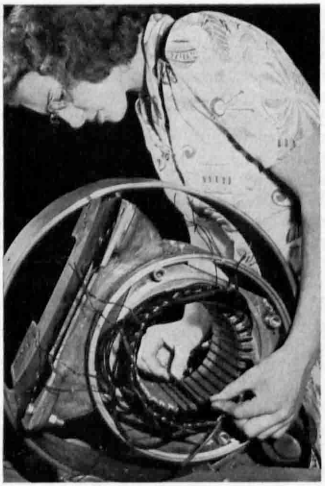

ELECTRIC MOTOR — Wire coils are being installed in the stationary part of one of the new all steel-encased motors under construction in the Buffalo plant of the Westinghouse Electric Corporation.

ENGINEERING

New All-Steel Motor Packs Greater Power

➤ CALLED the most revolutionary change in construction since the invention of the electric motor 58 years ago, a new all steel-encased motor developed by Westinghouse is revealed. It packs up to 134% more power per pound of weight than previous motors, and is designed to increase the efficiency of machine tools.

The frame for the new motor is made from a single piece of steel rolled into a circle with the ends welded, Leon R. Ludwig, manager of the Westinghouse plant in Buffalo, states. Obviously this frame is stronger than one of cast iron, he declares. The same goes for the bell-shaped covers for each end of the motor.

Keynote of the new motor, he continues, is its flexibility. Focal point of the flexibility centers upon the stator core, the circular stationary part, and the frame assembly. The identical stator core and frame assembly are used regardless of whether the finished motor will be drip-proof, splash-proof, totally enclosed fan-cooled, or totally enclosed non-ventilated.

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OPTICS

Sun's Dazzle Eliminated

Telescope-like instrument, icaroscope, reveals afterglow image instead of the sun itself. Phosphor screens are used.

➤ THE DAZZLE of the sun is eliminated when the solar disk is viewed through a new telescope-like instrument revealed to the Optical Society of America in New York. New knowledge of the sun and the surrounding sky may result; secrets hidden by the dazzling brightness may be revealed.

The instrument, described by Dr. Brian O'Brien of the University of Rochester, is called the icaroscope. With it the observer does not see the sun itself but views an afterglow image on a transparent phosphor screen.

Phosphor screens are glass or other material coated with a fine chemical powder that gives off light for a period after being excited by active light radiation and after the source of excitement has been removed. This secondary light is called the afterglow. In this case, the sun is the exciter. The image formed is bright and clear, and has no dazzle. The phosphor used is one whose afterglow is for a short period only.

In appearance the instrument looks like an ordinary telescope, and is used like one. The phosphor screen is near the eyepiece. Between them, however, is a revolving disk shutter. Between the screen and the telescope objective there is another disk shutter. The two are mounted rigidly on the same motor shaft, with the sector openings out of phase.

Thus the screen is not visible while being illuminated by the sun, but is viewed a half cycle later after the illumination is cut off. This is repeated at the rate of 90 cycles per second so that viewing seems to be continuous.

Dr. Gordon G. Milne, also of the University of Rochester, explained how the icaroscope screen is made. It is a slightly concave disk of glass with a thin layer of phosphor. The finer particles of the powder used are allowed to settle on the disk through a column of liquid.

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BIOCHEMISTRY

Proteinogen Suggested

Proteinogen as a working hypothesis

➤ A MOTHER substance of all proteins whether they occur in meat, enzymes, disease-causing virus or disease-fighting antibodies, was suggested to leading biologists and chemists attending the Princeton Bicentennial Growth Conference by Dr. John H. Northrop of the Rockefeller Institute for Medical Research, famed for his pioneer work in synthesis of some of the proteins.

The manufacture in the cells of this substance, christened proteinogen by Dr. Northrop, would allow the subsequent making in the blood of the various kinds of proteins, which are basic materials of life.

The new theory may lead sooner to artificial antibodies for disease fighting. These could be manufactured, instead of made in a living animal or man.

Getting energy into the building process that produces the proteins is provided simply by the new idea. This has been one of the stumbling blocks in working out how the body builds such materials.

The energy is put into the proteinogen molecule when it is synthesized from simpler chemicals, called amino acids. Then the normal proteins, viruses and antibodies are formed from the proteinogen mother substance without use of any new energy.

A substance made of giant molecules has been found in the blood of young cattle and unborn chickens and this may be proteinogen.

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More than nine-tenths of the billions of *stars* found in the entire sidereal system are located in the Milky Way.

Electric light *bulbs* vary in size from a one-fifth-watt bulb, about the size of a grain of wheat, used in medical instruments, to 10,000-watt lamps, larger than basketballs, used in airport floodlighting and motion pictures.

MEDICINE

Scientists Describe Cancer Growth Theory

➤ THE ESSENCE of all cancer comes from cells which nourish the early, embryonic stage of life months before birth. This is suggested by two University of California scientists, Ernst T. Krebs, Jr., and Charles Gurchot, on the basis of studies reported in the journal, *Science*, (Sept. 27).

In attributing all cancers to one factor, the California scientists differ from many other students of cancer who hold that cancer arises from many complex factors.

Finding a female sex hormone factor in the blood and urine of patients, both male and female, with many kinds of cancer led to the belief that cells that nourish the embryo play the important role in cancer.

These nourishing cells are called trophoblasts. They are never found existing harmlessly in the bodies of men or of women except during pregnancy. They produce a sex hormone called gonadotropin. The worst, most malignant cancers yield this hormone in a quantity duplicated only by the trophoblast cells. Less severe cancers yield this same hormone, the California scientists now find.

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NUCLEAR PHYSICS

Postwar Atom-Smasher Has 70,000,000 Volts

➤ LATEST postwar atom smasher is a 70,000,000-volt synchrotron being built at the General Electric Research Laboratory, Schenectady, N. Y., under a contract with the Navy's Office of Naval Research. The new instrument was described to scientists at the American Physical Society meeting in New York.

The synchrotron, combining features of the betatron and the cyclotron, was first independently proposed by Prof. Edwin M. McMillan of the University of California and the Russian scientist, V. Veksler, and a 300,000,000 electron-volt synchrotron is scheduled to be completed at the University of California early next year.

Dr. Herbert C. Pollock of the General Electric Research Laboratory predicted that the Schenectady synchrotron will be the first in operation in this country. He said the exact output of the machine is unknown, and it may exceed the "conservatively estimated" 70,000,000 volt figure.

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MEDICINE

Method Diagnoses Cancer

Electrophoresis machines analyze protein mixtures found in blood. This method also aids in the diagnoses of other diseases.

➤ A NEW method for diagnosing cancer and many other diseases was announced by Dr. Eric L. Alling of the University of Rochester, N. Y., School of Medicine and Dentistry at the centennial celebration of the University of Buffalo.

The method depends on the fact that dissolved proteins will migrate in an electric field. A technique for using this phenomenon, called electrophoresis, to analyze protein mixtures such as are found in blood was developed about 10 years ago. Its application to diagnosis of disease is relatively new.

The migration of the proteins follows certain patterns. The patterns of blood from a healthy person may differ from those of blood from a sick person.

Among 125 cases of all types of cancerous diseases, Dr. Alling found only one normal electrophoretic pattern.

In some diseases the electrophoretic patterns help in making a diagnosis, but in at least one disease, cancer of the bone marrow, the diagnosis can usually be made from the electrophoretic pattern alone. In 22 cases of this condition, called multiple myeloma, Dr. Alling has not seen one normal electrophoretic pattern.

Cirrhosis of the liver, hepatitis, acute rheumatic fever, two kidney diseases (nephritis and nephrosis) and Addison's disease are among those for which, Dr. Alling reported, electrophoresis can aid in diagnosis.

Very small irregularities in the peaks of the electrophoretic patterns, Dr. Alling stressed, may be of diagnostic value.

At the present time very few patients will have their blood or other body fluids analyzed by this method to help diagnose their illness because there are less than 40 electrophoresis machines in the United States. Also, Dr. Alling pointed out, it takes three hours to make one determination with this method and no more than two can be made in a day.

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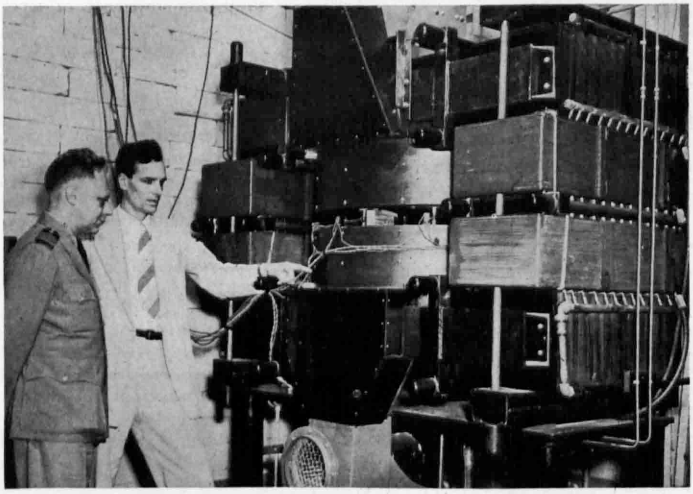

ATOM-SMASHER—This synchrotron is nearing completion at the General Electric laboratory in Schenectady, N. Y. It is capable of hurling electrons at energies of at least 70,000,000 volts.

MEDICINE

Arrow-Poison May Be Aid to Anesthesia

➤ A WAY to make curare, the old arrow poison of South American Indians, an aid to anesthesia for surgical operations, is being sought by Dr. Harold F. Chase, assistant professor of pharmacology at Western Reserve University School of Medicine.

A very small amount of curare relaxes muscles. In such major operations as removal of the gallbladder, cancer of the bowel and stomach ulcers, relaxation of muscles is important. This can be done by putting the patient into a deep state of unconsciousness, but it requires the use of large amounts of anesthetics such as ether.

The element of danger in using large amounts of anesthetic might be avoided if curare could be used with the anesthetic. Curare is a poison, however. Dr. Chase's studies are aimed at finding the exactly safe dose of this poison, or safe and effective chemical substitutes for it.

Victims of spastic paralysis, possibly of infantile paralysis, and of some mental diseases may also be helped if his studies are successful. Curare has been used in all these conditions. In mental disease, it is used to reduce the violent muscular contractions which sometimes result in broken bones when shock treatment is given.

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ORNITHOLOGY

Tropical Cormorants Really Neck in Courtship

➤ NECKING, in a quite literal sense, plays a prominent part in the courtship of a pair of flightless tropical cormorants at the National Zoological Park in Washington, D. C. The birds actually wrap their necks around each other.

Assistant Head Keeper Malcolm Davis has been doing a little winchelling on the romantic antics of the pair. It usually starts while the female is taking a nap. The male comes up, starts stamping around her, at the same time uttering the typical, harsh, croaking call of the species. That usually suffices to wake her up.

The birds then go swimming on the pond in their enclosure. They spin round and round in a small circle, facing each other. If there is a stick floating nearby, one of them will pick it up and hold it in its beak, keeping right on spinning. And they keep right on squawking.

Then the necking begins: "Gradually the birds come closer and closer together," Mr. Davis reports, "and finally they entwine their necks. During this stage, which may last for a couple of revolutions of the spinning performance, their cries become milder. The pair sometimes circle about in the pond for as much as two minutes, then part, swimming separately for a short while, only to join again with louder and apparently more excited cries."

Then they do it all over again. And all the time, says Mr. Davis, their breasts are throbbing rapidly.

All of which may look very funny to a bystander, but the birds take it seriously. And if they weren't so much engrossed with each other, they might have opinions of their own about the hand-holding couples who are watching them over the low fence. You can't tell what looks quaint to a cormorant.

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ORDNANCE

Navy Improves Weapons Until Time of New Ones

➤ PLUTONIUM-LOADED super-long-range rockets, radio-guided to targets picked out by their television eyes, are something for the more or less far future. Until these terrific weapons come, however, the Navy is devoting some attention to the improvement of more familiar tools of war.

Here are a few, as listed in *Army Ordnance* (Sept.-Oct.):

A new .70-caliber machine gun, to replace the present .50-caliber weapon, which was the terror of enemy aircraft during the recent war. Its bullets will be nearly three-quarters of an inch in diameter, instead of the present gun's half-inch. Fire will be radar-controlled.

An automatic three-inch anti-aircraft cannon, twin-mounted like the present 40-millimeter Bofors, but throwing proximity-fused shells of nearly double its caliber and five or six times the weight of the Bofors projectiles.

An automatic five-inch rocket launcher able to get off its whizzing missiles at the rate of 40 a minute.

Completely automatic ammunition-handling and loading machinery for the triple eight-inch guns of heavy cruiser turrets, that will make possible a rate of fire several times greater than that of the present mechanisms, which are partly manually operated.

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IN SCIEN

RADIO

Radio Facsimile Weather Service Inaugurated

➤ COMPLETE weather maps and diagrams transmitted by radio facsimile will link forecast centers in this country with overseas weather stations to provide literal, accurate pictures of flying conditions.

The first postwar radio facsimile weather service began Sept. 1 between Hickam Field, Oahu, Hawaii, and Fairfield-Suisun, California. Operated by the Army Air Transport Command's Air Weather Service, the transmissions are sent over the two-way circuit four times daily and include prognostic weather maps covering the air route from the Hawaiian Islands to the Pacific Coast, special weather charts and diagrammatic weather analyses.

Radio facsimile was developed during the war, and the electronic weather transmitting equipment will be maintained by the Army Signal Corps.

The four periods of weather transmission over the new link between Hawaii and California are 5-6:30 a. m., 11 a. m. to 12:30 p. m., 5-6:30 p. m. and 11 p. m. to 3 a. m., PST.

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CHEMISTRY

Too Much Manganese Gives Disease to Apples

➤ MANGANESE, the steelmaker's friend, can be the apple-grower's enemy if too much of it is available in the soil where apple trees grow. An excess of manganese in acid orchard soil was found responsible for a disease that produces dead areas on the inner bark of apple trees, in researches conducted at the University of West Virginia by Anthony Berg and Genevieve Clulo.

Known technically as internal bark necrosis, this plant disease has hitherto been supposed to be due to lack of boron in the soil. However, young apple trees grown in soil known to be free of that element did not sicken, while others grown in soil to which manganese, or a mixture of manganese and iron, had been added, developed unquestionable necrosis symptoms.

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E FIELDS

CHEMISTRY

NMRI-201, NMRI-448 Join Raid on Insects

➤ TWO EFFECTIVE new insect repellents have been developed at the Naval Medical Research Institute at Bethesda, Md., it is announced by Lt. L. A. Jachowski and Lt. Comdr. M. Pijoan in *Science* (Sept. 20). They have been designated NMRI-201 and NMRI-448, respectively. Of the two, NMRI-448 seems preferable, primarily because it does not irritate the skin, as NMRI-201 does in some cases.

Both repellents have the considerable advantage of retaining their efficacy when applied to sweaty skins. They were designed primarily for use against mosquitoes, but have been found effective against chiggers, black flies, sand flies, and bedbugs as well. One application will make these pests stay outside of biting range from three to twelve hours.

Science News Letter, October 5, 1946

RADAR

Light-Weight Radar To Make Flying Safer

➤ LIGHT-WEIGHT search radar, revealed by the Army Air Materiel Command, brings commercial and private planes one step nearer to the practical use of this war-developed safe-flying device. Only 125 pounds in weight, it can be used in any craft large enough to carry five passengers.

The Army will know the new development as the "APS-10." It is only a little heavier and slightly more complex than a home radio, Army officials state. Since it is operated by only five controls, it represents a great improvement over the 500-pound, 34-control radar employed by the Army during the war.

The new radar, designed to remove the hazard of flying in darkness or fog, with its cathode tube, 360-degree microwave scan, and reflections from objects in proportion to their position and degree of reflectivity, gives accurate fluorescent pictures of cities, rivers and terrain.

By flipping a switch, the scope can be made to trace any one of five ranges. The large-scale details of the four-mile setting are best suited for close traffic flying, while the 90-mile range is most useful for cross-country navigation. The other ranges are intermediate.

The APS-10 is the first of a series of projected light-weight, easy-to-operate and maintain search radars. It was developed in conjunction with the government's Radiation Laboratory in Massachusetts, and with radar manufacturers. Future plans call for a 75-pound unit, which will provide even greater range at still lower cost.

Science News Letter, October 5, 1946

AERODYNAMICS

Cloud Detector Makes Night Flying Safer

➤ ANOTHER device to make night flying safer is now revealed. It is the cloud detector, an instrument for pilots to detect invisible dangerous clouds ahead by use of the cloud's radiation of infra-red or heat rays.

These are the same invisible light rays that soldiers in the Pacific employed in their snooperscopes to detect night-prowling Japs. However, unlike the snooperscope, the cloud detector is a receiving instrument only. It receives and measures the heat emissions of the cloud given off from it in the form of infra-red waves.

Scientists of the Langley Memorial Aeronautical Laboratory, Langley Field, Va., have developed and tested an experimental model of the cloud detector, the National Advisory Committee for Aeronautics states in a report. The instrument is far from perfection as yet, but in a number of night flights it has conclusively demonstrated that it can detect the presence of clouds not visible to the unaided eye.

Clouds of moderate thickness are almost perfect emitters of infra-red radiations, the NACA scientists state. Water vapor and carbon dioxide are the only constituents of the clear atmosphere that are important in modifying the exchange of radiation. The new instrument provides a practical means for determining the exchange of radiation between the receiver of the cloud detector and a cloud as modified by the intervening atmosphere. The determination takes into account the effect of the carbon dioxide and water-vapor content of the air.

Science News Letter, October 5, 1946

DENTISTRY

Southern Men Have Fewer Dental Defects

➤ HOW GOOD your teeth are depends more on where you live than how big your bank account is, a study of teeth of men enlisting in the Navy at the beginning of the war shows. The study was made by Comdr. C. A. Schlack and Lieut. J. E. Birren, of the Naval Medical Research Institute.

Men from the South had fewest dental defects, whereas men from New England and New York, Pennsylvania and New Jersey had the most. The latter regions had next to the highest per capita income and a much larger ratio of dentists to the population than the South.

"The average man," the Naval scientists report in the journal, *Science*, (Sept. 20), needed more dental attention when he entered the service than he had had up to that time. The mean number of cavities was about 10 per person and of fillings five per person.

Science News Letter, October 5, 1946

NUTRITION

Discovery of Three New Vitamins Aids Nutrition

➤ THREE NEW vitamins mark scientific progress toward better-nourished men, women and children during the past year, Dr. Charles Glen King, scientific director of the Nutrition Foundation, Inc., states in his annual report.

The three vitamins are folic acid; the anti-stiffness factor, and a still unnamed B vitamin. Folic acid is also a B vitamin. Its role in warding off anemias, intestinal diseases and impairment of the normal function of the bone marrow have been reported by a number of investigators during the year.

The anti-stiffness factor and the unnamed B vitamin are known so far only for their effects in chickens and guinea pigs. But folic acid, not so long ago, was considered "only something that a bug needs," Dr. King points out.

Guinea pigs without the anti-stiffness factor in their food get an abnormal calcification of bones and flesh which makes them stiff.

Chicks need the unnamed B vitamin to grow, but humans may also need it for prevention of some forms of anemia. It is believed closely associated with folic acid in liver.

Science News Letter, October 5, 1946

GENERAL SCIENCE

Shortage of Scientists

Our reliance on such marvels of science as radar and the atomic bomb gives false security since there are few to carry on scientific work of the future.

By MARGARET E. PATTERSON

➤ IF YOU were asked to name the most serious shortage now facing us, would your answer be:

Nylons, sugar, steaks, shirts, meat, rubber?

These are not the right answers. A much more serious shortage menaces us today and threatens our future:

A shortage of scientists.

The annoying scarcity of nylon hose and thick steaks may temporarily blind you to the seriousness of a deficit of those individuals who should now be building in your post-war world.

To some the shortage of scientists may seem only a far-away threat to that promised existence of time-saving, labor-saving gadgetry, but it has been a matter of serious anxiety for six years to those who anticipated the circumstances in which we now find ourselves.

As early as 1940 scientific manpower training was cut in some fields and this curtailment has continued in ever increasing proportions. The deficit that has resulted is sweeping and costly. No recovery measures are yet established.

Every neighborhood has had its own cases of boys drafted or patriotically enlisting in the armed forces when their greatest usefulness to our country should be the training of those talents that are our country's rarest resource.

England and Russia learned their lesson in World War I. They zealously withheld those boys with ability in science from armed service in World War II. This uninterrupted training has given those countries a backlog of trained scientists untouched by war's ravages.

Our reliance on such marvels of World War II science as radar, proximity fuses, penicillin, DDT and the atomic bomb is a false security. Such applications of science can only be made for winning wars and securing peace by men and women who have mastered the intricacies of modern science. Once devised, these devices can be duplicated.

The atomic bomb was developed in five years but this speed in an emergency was only possible because the men who developed it had each had years of training in basic sciences.

While we have the atomic bomb, England and Russia have their stockpile of trained young scientists. Which spells security?

Science Talent Search

Just how seriously we have undercut our own security can be illustrated with carefully kept statistics on a small group of young scientists, all under 23 years of age. They are the winners in the annual Science Talent Search for the Westinghouse Science Scholarships, sponsored by Science Clubs of America, administered by Science Service.

For five years, 40 boys and girls have been chosen annually as winners from public, private and parochial schools. About 16,000 high school seniors enter this competition every year, only to be pared down by their own inability or lassitude to approximately 3500. These survivors are further reduced to 300 by a super-stiff science aptitude examination, consideration of high school scholastic record, personal recommendations and a 1000 word essay on "My Scientific Project."

CHEMIST — Better way to make synthetic rubber is Ph.D. problem of Wolf Karo, refugee winner, now at Cornell University.

From the 300, judges choose 40 winners who spend five days together in Washington at the Science Talent Institute learning first hand about the future of science from some of the world's foremost scientists. Some of the great research men and women of our time are expected to come from these winners of the annual Science Talent Search.

How did the 200 in the winner group fare in the war years?

There are 54 women in this highly selected research-talented group; they were untouched by the draft, of course. They have all had uninterrupted college careers.

There are 146 men and all are draft-eligible—or will be soon. Of these, 73 have been or are now in the armed services. This is a staggering percentage when one considers that 52 of the 146 are still under draft age.

Armed Service Programs

The high cost of war to our training of scientists is only slightly lessened by the fact that 30 of the 73 have been allowed to continue college work in armed service programs. Of these, 13 have won degrees and commissions, and another seven will finish their degrees and receive commissions soon.

Even those who have been fortunate enough to earn degrees during their tour of duty have often been forced to take them in fields which are not their major interests. They will have to begin their training again when they become civilians if they are to carry out the designs for their chosen professions.

This is a sad story in the light of what these young men should have been doing during the past years. But like thousands of other potential scientists, they met the situation with good grace and in many instances are grateful for experience in working with other men, travel, and the opening of new vistas of science which they might not otherwise have known.

Robert Mark of Trenton, N. J., has his degree from Massachusetts Institute of Technology in aeronautical engineering. As an ensign he has been

commissioned to specialize on guided missiles, pilotless aircraft and the operation of radio and radar guided missiles. But he still hopes to be a mathematician as he planned when he started at MIT as a civilian.

While still in high school Robert Hall of Green Bay, Wis., was a member of the Society for American Archaeology and had gained some reputation for his published studies on the restoration of Indian pottery found in his state. He went directly into the radio technician training in the Navy and has had to discontinue his archaeological studies and writing on the Iroquois Indians until he can enter college.

Murray Gerstenhaber of New York City wants to be a mathematician. Before being drafted, he spent two years at Yale, where he received the Thatcher Award for "highest proficiency in basic physical sciences." Now a Pfc. in the occupation forces, he is assigned to the science department of American University in Berlin as an administrative noncom. In the evenings he attends the Mathematics Institute of the University of Berlin, where he studies algebraic functions in a seminar with the professor and four instructors.

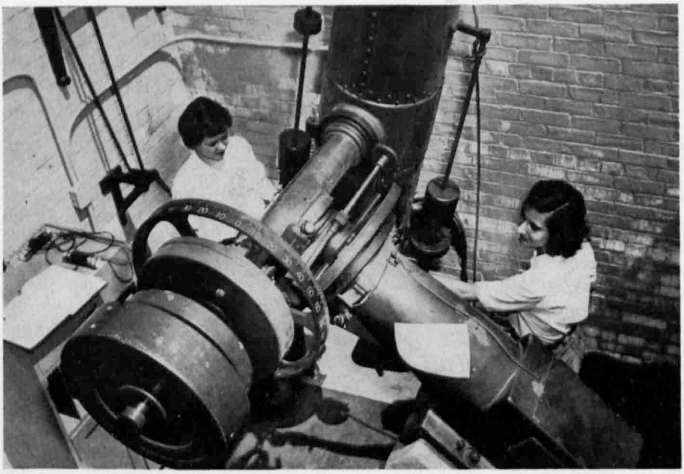
Before he went into the Army three years ago, Barton Brown of Sea Cliff, N. Y., was a student of chemistry at MIT. He has now returned to college to study electronics in which he became interested from his war service.

Some Continue College

Only 28 men chosen as winners in the first three Science Talent Searches have been free to continue their college careers uninterrupted by the armed services. They have chosen the following professions: physics (8), medicine (6), chemistry (4), chemical engineering (3), mathematics, anthropology, biochemistry and electrical engineering.

Among them are 10 with undergraduate degrees, two with masters' degrees and two already at work on their Ph.Ds. Four are well started in medical school. Three of the 28 are Phi Beta Kappas and one has been elected to Sigma Xi.

Paul Cranefield of Columbus, Wis., has completed his first year of medical school at the University of Wisconsin and plans to specialize in physiology. He was a student assistant in chemistry and physics during his undergraduate days there and taught younger STS winners. He turned his assistantship over to Elizabeth Lean of Shorewood, Wis., another winner, when he entered medical school.



STAR-GAZERS—Color of stars is studied by Constance Sawyer of Smith and Anne Hagopian of Radcliffe at Harvard's Oak Ridge Station.

The top boy winner in the first Science Talent Search is Paul Teschan of Shorewood, Wis., who has finished his second year at the medical school of the University of Minnesota. A member of Phi Beta Kappa, he finds time for a regular job of lecturing to nurses. He plans to be a physician but will make teaching, and clinical and medical research his specialty.

Murray Rosenblatt of New York City will enter Cornell in the fall on the Erastus Brooks Fellowship to begin his graduate work in mathematics and mathematical physics after graduating Phi Beta Kappa from College of the City of New York. He has spent a summer at the Bureau of the Census in examinating the results of the Agricultural Census of 1945 in an attempt to eliminate bias.

Others in College

At the University of Michigan, Irving Rozian of Hazel Park, Mich., is working for degrees in both chemical and electrical engineering. He held a student assistantship during the war in secret electronic research and has done drafting and drawing for a commercial firm and illustrated books.

During his high school days Edward Kosower, top boy winner of 1945, had a chemical business with Andrew Streitwieser, another STS winner in Brooklyn, N. Y. Now Edward is a student at MIT, where he had often sold his war-short chemicals. He continues to publish the results of his research in chemical journals and in the Tech Engineering News. Because of his proficiency he has been allowed to skip certain courses in organic chemistry.

Clifford Swartz of Niagara Falls, N. Y., had two degrees from the University of Rochester at the age of 21 and had been elected to Sigma Xi and Phi Beta Kappa. He is now at work on his Ph.D. thesis in nuclear physics there and has been serving as a graduate assistant to Dr. Lee DuBridge, who will now assume the presidency of California Institute of Technology.

The 54 women who have been named as winners in the Science Talent Search present an encouraging picture as their education has been uninterrupted by war service.

Do You Know?

Nearly half of each year's *drowning* victims lived in rural areas.

In every second the *sun* loses in the form of energy 4,000,000 tons of its substance.

The human body contains about enough *sulfur* to kill the fleas on the average-sized dog.

The use of *casein* as an adhesive dates back to the eleventh century when glue was made out of curds and slaked lime.

Nicotine has been a valuable tool in the hands of neurophysiologists in mapping out fibers of the involuntary nervous system.

The U. S. Department of Agriculture has bought about 32,000,000 pounds of *frozen eggs* for distribution to bakers and other food manufacturers in England.

Though some are still too young to have chosen their fields, the winners of the first three years are following these professions: chemist (11), physician (5), biochemist (4), mathematician (3), astronomer (3), zoologist (2), chemical engineer, psychologist, biologist, physicist and anthropologist.

Nine already have undergraduate degrees, one a master's and will start this fall on her Ph.D. and three are well started in medical school. Six of them are Phi Beta Kappa and one has been elected to Sigma Xi.

Having finished two degrees at Ohio State University, Mrs. Gloria Lauer Grace will enter Columbia University this fall on a fellowship to work on her Ph.D. in psychology. A member of Phi Beta Kappa and Mortar Board, she was teaching assistant and psychomatrician at Ohio State during the past year. She was married this spring to a returned veteran who will also study at Columbia. Mrs. Grace was the top girl winner in 1943.

Her undergraduate work at the University of Illinois finished, Elizabeth Foster of Oak Park, Ill., is now at MIT, where she is a research assistant and studying for her second degree in biochemistry. At Illinois, where she was elected to Sigma Xi, she made a study of fibrous proteins with the electron microscope. Last summer she studied cellular physiology at the Marine Biological Laboratory at Woods Hole, Mass.

After five years the Science Talent Search has become a fixture and tradition in the high schools of the country. Thousands of boys and girls now are at work on their entries in the Sixth Science Talent Search hoping to bring honor to their schools again or for the first time. They hope, too, that they will be among the 40 trip winners to Washington and recipients of Westinghouse Science Scholarships.

But even those who do not place as one of the 40 trip winners may be among the 260 honorable mentions named and assisted by recommendations to enter the colleges, universities and technical schools of their own choice.

Science News Letter, October 5, 1946

NUTRITION

C-Rations Make Exit

➤ NO MORE C-rations!

This pet hate of combat GI's is on the way out. Its place will be taken by a new battle-front food assortment to be known as E-rations.

Superficially, E-ration resembles C-ration. It is made up of six cans, containing rations for one man for one day. But there have been some changes made. Three outstanding ones are:

Canned baked bread—real white bread—instead of those (deleted by censor) biscuits.

Larger variety of meats.

Addition of a can of fruit.

A 30-day test of the new ration on troops of the Third Battalion, 38th Infantry has been conducted at Camp Carson, Colo. Representatives of the Quartermaster Corps and the Army Surgeon General's Office are coming to the conclusion that it is the most satisfactory individual combat diet yet developed.

There aren't as many calories in the new E-ration as in the old C-ration, but this is offset by the fact that soldiers used to throw away items from the C-ration that they didn't like. So the net result is likely to be more food actually eaten out of the smaller package. The new ration, incidentally, weighs just one-half ounce under four and one-half pounds.

Officers in charge of the test are not yet satisfied with the canned white bread, and have directed that research continue for bread that will meet specifications.

Science News Letter, October 5, 1946

Announcement to Teachers

"After reading Science News Letter thoroughly, I feel still more certain than before that your publication is the *only practical means* for a high school boy to keep up with the sciences." DONALD ROSS, Student at Cranbrook School, Bloomfield Hills, Michigan.

"You have a splendid publication and I wish that it could be in *every* library and in *every* reading room." P. B. HILL, 106 East Goodwin St., Victoria, Texas.

"Science News Letter is discussed very thoroughly in our classrooms. We are happy to be able to get such information. Each student looks forward to Friday classes which are devoted to Science News Letter. We are thankful to get up to date developments in the various fields of science." M. C. SMITH, Oxford, Florida.

"This is to let you know that I have been receiving the Science News Letter and it has proven to be a *helpful source* for information in the guiding of my students into the proper channels for current news on scientific problems." GEO. B. HOLLINSWORTH, 508 S. Randall St., East Point, Georgia.

"Science News Letter came to my husband, DR. W. W. Hickman, in Assuit, Egypt (Assuit College) for many, many years. It was *avidly devoured* by many—not only American and Egyptian staff members but also by aspiring students." MRS. ALICE E. HICKMAN, 1125 East Detroit Avenue, Monmouth, Illinois.

"We have been reading Science News Letter for one year now, and we like it better than any other publication of this kind we have seen. The *whole family* enjoys the short easy-to-understand articles on science which affect the everyday lives of people." W. P. SELLERS, P. O. Box 216, Washington, Louisiana.

"The fact that I am unwilling to miss a single issue of Science News Letter should be adequate evidence of the esteem in which I hold it." JAMES T. LAING, Head, Dept. of Sociology, Kent State University, Kent, Ohio.

"I think Science News Letter carries the best news I've seen—so does the C. P. Club," SISTER M. COLETTE, St. Benaventure High Schol, 1806 15th Street, Columbus, Nebraska.

"Very *instructive* magazine. I could not do without it in my teaching." MISS NORMA KOCH, R. R. #4, Box 476, Indianapolis, Indiana.

"I can truthfully say that Science News Letter and Chemistry are invaluable *aids* in my chemistry classes." MRS. MARY E. VOORHEES, Belt, Montana.

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PHOTOGRAPHY

Photosensitive Lacquer Aids Accuracy, Detail

➤ A UNIQUE contribution to photography was made by the Germans in a photosensitive lacquer, tough enough to require no hand-applied reinforcement coat that cuts down on fineness of detail and accuracy of reproduction.

In the screen printing process, a solution of polyvinyl acetate and ammonium bichromate is painted over a bronze or silk gauze screen. A positive print of the design is placed over this photo-sensitive surface, which is then exposed to direct light for several minutes. The light causes the bichromate to oxidize the exposed plastic coating into an insoluble film.

Before printing, the lacquer is further hardened by dipping the screen into a formaldehyde solution. The result is a screen that is highly durable and resistant to chemical action.

Science News Letter, October 5, 1946

AGRICULTURE

NATURE RAMBLINGS by Frank Thone

Hybrid Corn

➤ DURING all the shouting and the tumult that accompanied and followed Henry Wallace's exit from public office, no one seems to have taken thought to mention what may in the end turn out to be the man's greatest contribution to the welfare of his country: the introduction into general cultivation of hybrid corn.

Henry Wallace did not originate hybrid corn. First work in corn hybridization was done shortly after the turn of the century by two men, Dr. George H. Shull and the late Dr. E. M. East. Other geneticists followed up their work and made further advances. Scientists knew about this, but farmers didn't. And they kept on planting the old varieties of mixed and haphazard ancestry.

Ten or a dozen years before he became Secretary of Agriculture, Henry Wallace, then still editor of the farm weekly his grandfather had founded, started a campaign to get farmers to plant hybrid corn. Since hybrid seed has to be produced by a special technique not at the command of every farmer, he also founded a company to produce and sell it, which is still in business.

It was difficult at first to persuade hard-headed farmers to buy the necessarily expensive hybrid seedcorn, when they could raise their own open-pollenated seed. But figures on comparative yields per acre are a language every farmer can understand. Once a start was made, cultivation of hybrid corn spread very rapidly, until now practically all of the corn raised for meat or money in this country is of hybrid strains.

When he started his campaign, Henry Wallace ventured the estimate that growing hybrid corn would give the farmer a ten per cent better yield per acre than the old varieties. He proved to be much too conservative: the average per-acre increase has been nearer twenty per cent.

Hybrid corn's advantages are twofold: First, because pollenation is strictly controlled, it is possible to breed into a new strain any desired set of hereditary qualities, such as high protein content, drought resistance, etc. Second, the plants have what is known as hybrid vigor. Hybrids generally, whether plant or animal, tend to be bigger, stronger and more robust than either of their parents—consider, for example, the mule. This combination of predictable genetic behavior and individual lustiness is what has made hybrid corn a winner.

Science News Letter, October 5, 1946

GENERAL SCIENCE

Army Trains Four Groups Of German Shepherds

➤ DOGS ARE more important in the future plans of the Army than horses, with sledge dogs serving in the North and German shepherds scheduled to be trained as infantry scouts. The Army is still raising horses, but as a service to breeders instead of for military use.

Although 20,000 dogs of five different breeds were used by the Army in World War II, most of these have been discharged, and the new "dog's life Army" will start out with only four platoons of 27 dogs each. These are stationed at Camp Campbell, Ky., Fort Bragg, N. C., Fort Lewis, Wash., and Fort Riley, Kans.

Experience during the war showed that German shepherds were superior for infantry scouting to Belgian sheep dogs, Doberman pinschers, farm-type collies and schnauzers, so the Army will use only the German shepherds. The Army rated them tops in intelligence, durability and size for combat duty.

The Quartermaster Corps plans to acquire 30 of the dogs each year as replacements. Only German shepherds between one and two-and-a-half years old are eligible.

The dog's instructors will receive an eight-week training course at the Aleshire Quartermaster Depot, Front Royal, Va., and these men will be in charge of training both the dogs and handlers assigned to platoons with dogs.

Science News Letter, October 5, 1946

Books of the Week

AIRCRAFT CARBURETION—Robert Thorner —*Wiley,* 393 p., illus., diags. and charts $3.50. This book deals with the fundamental principles of carburetors and related equipment in aircraft. It is designed for aircraft mechanics, pilots and flight engineers, development engineers and designers, field service engineers for airplane engines, as well as for use by students taking a course in aircraft engines.

THE AMAZING ELECTRON—James Shannon —*Bruce Pub.,* 248 p., illus., diagrs. and charts, $4.00. In a carefully planned explanation the author shows the nature of the electron: its mass, its charge, its relation to the whole atom and its role in the make-up of the atom.

AMINO ACID ANALYSIS OF PROTEINS—Roy W. Miner, Ed.—*New York Academy of Sciences,* 183 p., tables, $2.25. Vol. XLVII, Art. 2.

THE CAR OWNER'S HANDBOOK—Paul Green and Ralph Ritchen—*Duell, Sloan and Pearce,* 192 p., illus. and diagrs., $2.50. In an easy and practical way this introduces car owners and drivers to the make-up and function of the automobile. The ways and means of keeping a car running and in good condition are described in the clearest manner.

DEVELOPMENTAL ANATOMY: A Textbook and Laboratory Manual of Embryology, 5th Ed.—Leslie B. Arey—*Saunders,* 616 p., illus., $7.00. A review of the world literature in embryology since 1940, and particularly as it affects human development.

FAMILIAR TREES—William A. Murrill—*published by the author,* 174 p., illus., $3.00. This book was written especially for persons living in the United States east of the Rockies. The language is fairly simple and the treatment introductory.

FUNDAMENTALS OF CHEMISTRY, 6th Ed.—L. Jean Bogert—*Saunders,* 571 p., illus. and diagrs., $3.00. A textbook of the theory and applications of chemistry for the Senior high school level with accompanying LABORATORY MANUAL OF CHEMISTRY, 5th Ed., 196 p., $1.00, and SUGGESTIONS FOR COURSES IN GENERAL CHEMISTRY, a teacher's guide.

GLASS HOUSE OF PREJUDICE—Dorothy Baruch—*Morrow,* 205 p., $2.50. This book describes the results and causes of prejudice toward minority groups in the United States. It explains with clarity and force the effects of prejudice both on the people toward whom it is felt and on the people who feel it.

GROWING UP SAFELY—Frances Mayfarth, ed.—*Assoc. for Childhood Education,* 28 p., illus., paper, 50 cents. This bulletin has been prepared for the teachers in the elementary school in the hope that they will find it helpful in their work with parents and in their planning for the best development of the children they teach.

MATHEMATICAL METHODS OF STATISTICS—Harold Cramer—*Princeton University Press,* 575 p., $6.00. The author has joined classical calculus and mathematical theory in a masterly exposition of the mathematical methods of modern statistics.

PEOPLE IN QUANDARIES: The Semantics of Personal Adjustment—Wendell Johnson—*Harper,* 532 p., $3.75. This book deals with the problems that plague all of us day in and day out as we try to get along with ourselves and with each other. They are the basic problems of our homes and communities, our schools and industries, our nation and our world.

PLANT MAGIC—James P. Haworth—*Binfords & Mort,* 148 p., illus., $3.00. A book that tells the fascinating story of how nature creates new plant species and of man's progress in learning and applying her secrets.

PRINCE GODFREY: The Knight of the Star of the Nativity—Halina Gorska—*Roy Pubs.,* 207 p., illus., $3.00. Within this book are twelve wondrous tales concerning Prince Godfrey. It tells the adventures of one brave knight who was like Galahad in his purity and kindliness.

UNUSUAL WORDS: And How They Came About — Edwin Radford — *Philosophical Library,* 318 p., $3.75. A collection in a single volume of the principal proverbial "tags," phrases and words, together with their origins and derivations.

USING OUR WORLD—Powers, Neuner, Bruner and Bradley—*Ginn,* 665 p., illus., and diagrs., $2.16. This textbook, developed from the three books in the "Adventuring in Science" series, makes the study of general science a delightful adventure for ninth-year pupils.

UTILIZATION OF SEAWEEDS FROM THE SOUTH ATLANTIC AND GULF COASTS FOR AGAR AND ITS DECOMPOSITION BY BACTERIA—*Duke Univ. Press,* 80 p., illus. tables, charts, paper, $2.00. Duke Univ. Marine Station Bulletin No. 3.

THE YALE COLLECTIONS—Wilmarth S. Lewis—*Yale Univ. Press,* 54 p., illus., $2.00. This is a short survey of the collections of books and manuscripts, objects of art, natural history and anthropology, which have come to Yale during the past two and a half centuries.

Science News Letter, October 5, 1946

RADAR

Radar Information Projected on Screen

➤ RADAR information can be projected on a screen, and made visible to a large group of people by German-developed equipment. With a new dark-trace cathode ray tube, the image can be retained indefinitely for study, or can be completely erased.

Science News Letter, October 5, 1946

•New Machines And Gadgets•

ELECTRIC water heater may be quickly attached to a kitchen faucet. Spherical in shape, it contains coils of rubber tubes through which the water passes, the heat being furnished by an unique arrangement of electric heating elements.

Science News Letter, October 5, 1946

WIND-DRIVEN electric generators, to charge farm storage batteries, are designed to operate in the varying winds. Two generators on a single shaft are separated by a clutch. The first operates at full load under light wind. Stronger wind causes the clutch to engage the other, thus putting more load on the windmill and holding down its speed.

Science News Letter, October 5, 1946

CUTTING attachment for garden hose is a thin, reinforced hardened steel blade with a sharp cutting edge that fits over the ordinary hoe blade. It has side flanges to hold it in place, and stops or seats for taking up the thrust of the blade against the plate when in use.

Science News Letter, October 5, 1946

HEDGE TRIMMER has two metal disks pivoted together at their centers, each of which has arched cutting teeth at their outer edges. The teeth on each are arched in opposite directions, and cut like hooked clippers when the extended handles are pressed together.

Science News Letter, October 5, 1946

HEEL-STRAP OVERSHOES, shown in the picture, have non-skid soles made of neoprene, a synthetic rubber that resists wear, abrasion and injury from street oils. They can be cleaned with soap and water, or with ordinary cleaning fluid, so that they will not soil articles in a handbag.

Science News Letter, October 5, 1946

SCAFFOLD, particularly suited for inside work, is made of a plank and two special ladders. The ladders, like those in ordinary step-ladders, have bars across the rear and just above each step. These, with the steps, grasp the plank firmly when the ladders are leaned inward.

Science News Letter, October 5, 1946

BABY comfort crib has a special mattress supported over a horizontally rotating electric fan which forces air through it for cooling by means of tubular channels. By a special heating arrangement warmed instead of cooled air can be delivered.

Science News Letter, October 5, 1946

DEWPOINT recorder determines automatically and continuously the amount of moisture in a gas, and might be used in refrigerators. It is an electronic combination of heater, refrigerator, mirror and gas chamber. Gas under test is fed over a stainless steel mirror, forming dew on it when properly heated or cooled.

Science News Letter, October 5, 1946

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 331. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

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