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SCIENCE NEWS LETTER

Vol. 50, No.

THE WEEKLY SUMMARY OF CURRENT SCIENCE • JULY 13, 1946



Bikini Aftermath

See Page 22

A SCIENCE SERVICE PUBLICATION

1921

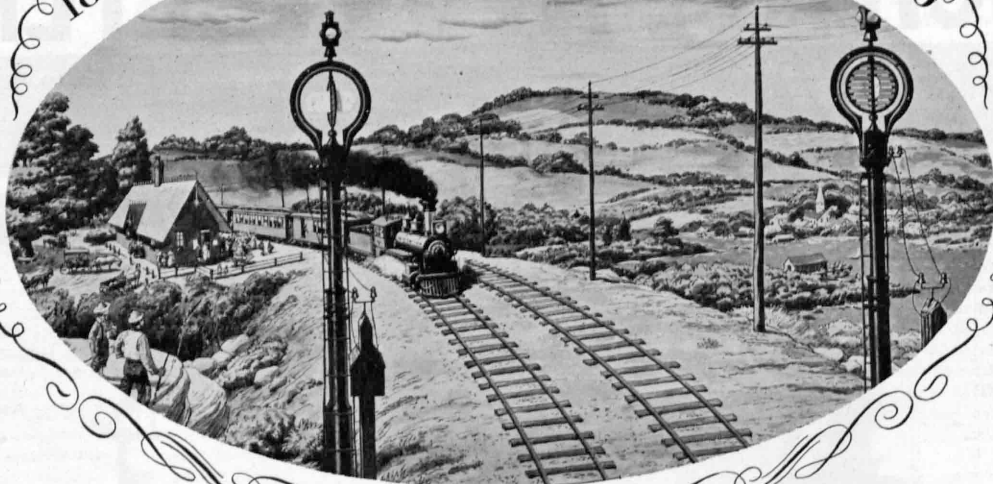
TWENTY-FIFTH ANNIVERSARY

1946

GEORGE WESTINGHOUSE CENTENNIAL

1846

1946



Semaphores of Safety

Although world-famous as the inventor of the railway air brake, few people realize that George Westinghouse also pioneered the *first automatic block-signaling system* for railroads.

While developing the air brake, Westinghouse clearly foresaw the need for improved railway traffic controls—to meet the demand for *greater speed and safety* in our rapidly expanding transportation systems.

In those early days, switches and signals were moved by hand. But, in such manually controlled devices, too much depended on the human element.

A watchman might fall asleep—or become ill. Or some other mishap might break the human links in the chain and lead to disaster.

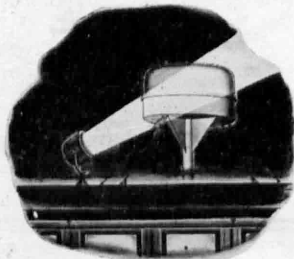
In 1881, George Westinghouse began to apply his brilliant inventive genius to the problem of power signaling and interlocking. As one scientist expressed it, “he used compressed air for the heavy work, electricity to pull the trigger.”

And the same basic principles of railway signaling, developed by Westinghouse more than half a century ago, *still serve in controlling our vast railroad networks of today!*

Westinghouse
PLANTS IN 25 CITIES OFFICES EVERYWHERE

TODAY—The Westinghouse Electric Corporation is providing *semaphores of safety* in yet another field—marine transportation. Recently, Westinghouse engineers equipped an Old Bay Line steamship with a *radar navigational aid* . . . to guide it safely through fog and dark of night.

Now the S.S. “City of Richmond” makes its nightly run between Baltimore and Norfolk—*safely and free from delays* due to bad weather. Similar Westinghouse radar installations are now planned for use on inland waterway, coastal and ocean-going craft.



Time in: TED MALONE—Monday, Wednesday, Friday, 11:45 am, EDT, American Network

GENERAL SCIENCE

Senate Votes Foundation

S. 1850 authorizing National Science Foundation wins approval; social sciences eliminated; attempts to ban science scholarships and change patent provisions lose.

By WATSON DAVIS

► TWO DIVERGENT views of science and research were made clear in the three days of Senate debate which resulted in the passage on July 3 of the National Science Foundation bill.

One view is that science is for the people, who act through their government to support the creation and application of scientific knowledge. What is discovered is important to all and should be freely available to all.

The other view seems to consider science as a useful but very special mechanism that can be best left in the hands of large boards of scientists appointed for long terms and remote from democratic control. The people through their government should not be concerned with the application of science. Non-governmental organizations involved should be allowed to acquire monopolies through the patents resulting from government-supported research.

The bill, passed 48 to 18, embodies the science-for-the-people viewpoint. Except that social science research provisions were eliminated on the floor, S. 1850 is essentially as it emerged from many months of hearings which combined earlier science bill versions by Sen. Harley M. Kilgore, D., W. Va., and Sen. Warren G. Magnuson, D., Wash., who both led the successful support for the bill.

The successful Senate bill was introduced by a bi-partisan group of eight senators, including Senators Kilgore and Magnuson. Others were: Sen. Edwin C. Johnson, D. Col., Sen. Claude Pepper, D., Fla., Sen. J. William Fulbright, D., Ark., Sen. Leverett Saltonstall, R., Mass., Sen. Elbert D. Thomas, D., Utah, and Sen. Homer Ferguson, R., Mich.

The fact that some senators voted against the bill in the final vote shows that some senators can afford to be against science even in an atomic-penicillin age. About a decade ago no senator desired to be in favor of cancer when all the then senators joined in introducing a cancer research bill that was thus passed when it was introduced.

The final vote on S. 1850 does not tell the vigorous fight to modify or replace the bill waged by Sen. H. Alexander Smith, R., N. J., Sen. H. F. Byrd, D., Va., Sen. David I. Walsh, D., Mass., Sen. Raymond E. Willis, R., Ind., Sen. Thomas C. Hart, R., Conn., and Sen. John L. McClellan, D., Ark.

The first attack of these senators came as a substitute for S. 1850 in its entirety. Instead of the normal governmental agency set-up, control would have been placed in a 60 member board of virtual permanence, since appointments were to be for 16 years. The substitute differed from S. 1850 in most of its other provisions, eliminating undergraduate scholarships, specific patent provisions, etc. This attempted substitute lost 39 to 24.

Board Control Defeated

The bill was then attacked by the Smith group with specific amendments. The attempt to place control of the foundation in the hands of a board of nine instead of an administrator with an advisory board lost by only one vote.

A 41 to 31 vote defeated an amend-

ment that substituted for specific patent provisions of S. 1850 a general statement providing for the protection of the public interest and the equities of the contracting individual or organization. Sen. Chapman Revercomb, R., W. Va., was most concerned over what he considered a threatened change in the patent system, although only inventions made with governmental foundation support were concerned.

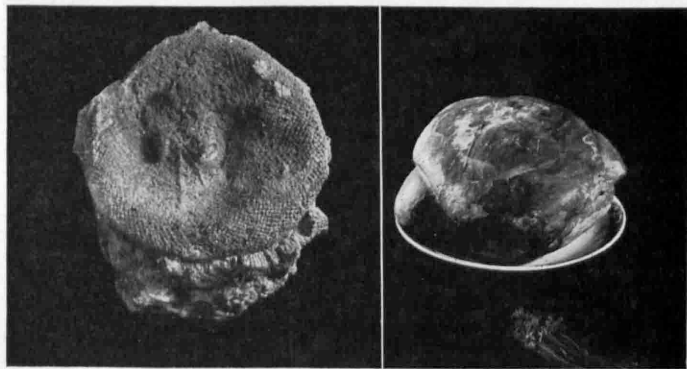
To prevent the giving of scholarships to science-talented high school graduates was the purpose of an amendment by Sen. Hart, defeated 42 to 27. Another amendment by Sen. Hart preventing the foundation from operating in the field of the social sciences won 46 to 26.

How soon the House can act on S. 1850 is problematical. Two days of hurried hearings have been held on a House science bill recently introduced that differs from the Senate bill and resembles one of the earlier Senate bills out of which S. 1850 was compounded. But the chances now seem to be good that a science foundation bill will be enacted by Congress this session.

Senate Vote on Science Bill

For the bill—48.

Democrats voting for—(37)—Andrews, Barkley, Carville, Chavez, Downey, George, Gossett, Guffey, Hayden, Hill, Hoey, Huffman, Johnson of Colo., Johnston of S. C., Kilgore, Lucas, Magnuson, Maybank, McCarran, McClellan, McMahon, Mead, Mitchell, Murdock, Murray, (Turn to Page 23)



FLOWERS AND FOOD—Sometimes geological specimens are not at all what they seem to be. The withered head of a sunflower on the left is really a hard rock fossil sponge, while the frankfurter in a bun on the right is actually a concretion. These unretouched photographs from the Cranbrook Institute of Science show what freakish forms rocks and minerals sometimes take.

MEDICINE

Life-Saving Methods Told

Many new medical discoveries reported to A.M.A.: Successful treatment for skin cancer, anti-blood clot chemical, and safer and more effective lung surgery.

By JANE STAFFORD

► EXTRACTS boiled out of human spleens and livers have been used successfully in treatment of certain kinds of skin cancers, Drs. Joseph C. Amersbach, Elsie M. Walter and George S. Sperti, of the New York Post-Graduate Medical School and Hospital, Columbia University, and the Institutum Divi Thomae, Cincinnati, reported at the meeting of the American Medical Association in San Francisco.

All of the cases treated were very small skin cancers and no work was done on internal cancers, the doctors pointed out.

None of the patients who have finished the treatment have shown any signs of reappearance of the cancer in a period of two to four years, but all will be carefully watched for a period of five years.

Altogether 46 patients were treated. The six most recent were treated with extracts of lamb liver. The cancer has entirely disappeared in one and the other five are still under treatment but have shown definite improvement, the doctors reported.

"Of the 17 treated with the human spleen extracts, two failed completely, two were surgically removed because the lesions (cancers) were very slow in disappearing, two failed to finish the treatments but the lesions were 50 to 90% improved when the patients were last seen, and in 11 cases the lesion completely disappeared," Dr. Amersbach said.

"In the 10 cases treated with extract of human liver, one lesion was surgically removed because it was too slow to disappear or regress, nine showed complete disappearance of the lesion and three are still being treated."

The extracts were injected into and around the skin cancers once a week for from three to 30 injections.

The treatment reported resulted from much research by numerous investigators trying to induce resistance to cancer in laboratory animals and to find a method of treating cancer by some means other than surgery, X-rays or radium. The skin cancers treated were of a not very

serious type and were selected because if the treatment failed there would be no danger to the patient, since the more usual treatments could still be used.

Drug Prevents Blood Clots

► DICOUMARIN, the anti-blood clot chemical, is saving lives of those who otherwise would have died, Dr. Edgar V. Allen of the Mayo Clinic reported at the meeting. Among 1,686 patients undergoing surgical operations, approximately 73 who would have been expected to die are alive.

The lives saved were threatened by the clots which sometimes form in blood vessels, blocking the circulation, after operations, injury or disease. Many of these clots form in the veins of the legs. Many a woman knows about them from having suffered after childbirth the painful condition of thrombophlebitis. When these clots, technically termed emboli, are torn loose they may travel through the circulation and lodge in the smaller vessels of the heart or lungs, causing death.

Dicoumarin makes the blood clot less readily. It was discovered because of fatal hemorrhages in cattle that ate spoiled sweet clover.

Another anti-blood clotting chemical, heparin, is also being tried to prevent blood clots after operations. This chemical is obtained from animal lung tissue. Its chief disadvantage is its expense. Daily cost of treatment with heparin may run to \$9 while that for dicoumarin is only a few cents.

Both of these drugs have the disadvantage that hemorrhage may result from their use. They represent, Dr. Allen said, "only the first steps in the direction of securing satisfactory anticoagulants for clinical use."

Hemorrhage occurred in 3.1% and major hemorrhage in 1.9% of the 1,686 cases he reported.

Cure for Bronchiectasis

► CURES BY SURGERY of 42 out of 50 patients suffering with a chronic bronchial condition called bronchiectasis

were reported by Drs. Ralph Adams and Bernard J. Ficarra of Boston at the meeting.

Real cure of this condition, they believe, can be effected only by cutting out the diseased lung tissue. They advise operating early in the course of the disease, not as a last resort, because through surgical cure the patients get "renewed competence to enjoy life and to assume its responsibilities."

They stressed the adverse effect the disease has on the patient's personality and ability to go to school or work.

Bronchiectasis is produced by a blocked or inadequate drainage of the bronchial tubes, plus some infection which weakens the muscular walls of the air sacs

SCIENCE NEWS LETTER

Vol. 50 July 13, 1946 No. 2

The weekly summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W., Washington 6, D. C. NORTH 2285. Edited by WATSON DAVIS.

Subscriptions—\$5.00 a year; two years, \$8.00; 15 cents a copy. Back numbers more than six months old, if still available, 25 cents.

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Entered as second class matter at the post office at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, *Abridged Guide*, and the *Engineering Index*.

The New York Museum of Science and Industry has elected SCIENCE NEWS LETTER as its official publication to be received by its members. Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 293 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago, STAt 4439.

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and tubes, causing them to lose their elasticity and to expand. They may increase to many times their normal size. Then mucus from the glands which line the tubes collects in the enlarged tubes and air sacs.

The condition often follows such infections as lung abscess, tuberculosis, chronic bronchial infections, obstruction in the bronchial tubes by mucus, polyps, tumors or foreign bodies such as peanuts which may be inhaled accidentally. Also it may follow measles, whooping cough or other childhood diseases.

"There can be little doubt," Drs. Adams and Ficarra said, "that a prolonged struggle against chronic disease may influence the character and career of any man. Patients with bronchiectasis often fall into this category. By the general public, these patients are branded as having tuberculosis. Oftentimes they have been studied in vain for tuberculosis."

"In the young, schooling is neglected because illness renders the child unable to keep pace with his classmates. With expressive but cruel wit, one child with a chronic cough was nicknamed. 'The Barker' and another with foul sputum as 'Stinky' by his fellows, and they henceforth attended school only under duress."

Childrens' Lives Saved

➤ A NEW life-saving operation for children born with a defect of the body's main artery was reported by Dr. Robert E. Gross of the Children's Hospital, Boston.

The defect is in the aorta through which blood from the heart starts on its course to all parts of the body. Some babies are born with the aorta narrowed or completely closed a short distance from the heart.

Dr. Gross saves the children by cutting out the narrowed or closed part of the aorta and sewing the cut ends together. The first patient was operated on just a year ago, after studies on animals showed the operation would succeed. Nine others have since had the operation. Of the ten, two died, but these deaths showed how others can be avoided and the operation made safe in the future.

These two deaths showed how others can be avoided and the operation made safe in future. One of the lessons learned was that the operation should not be done on patients over 15 years old, be-

cause the high blood pressure by that time will have made the walls of the aorta so hard and thick that its cut ends cannot be satisfactorily sewed together. The other lesson is that the clamps on the aorta to stop bleeding during the operation must be released very slowly.

Feeble-mindedness Checked

➤ AN OPERATION that rescues babies from the fate of being feeble-minded all their lives was reported by Dr. Franc D. Ingraham and Dr. Donald D. Matson of the Children's Hospital, Boston, Mass.

The operation consists of removing blood clots that formed on the baby's brain. Cause of the clots is injury, either during birth or, in some cases, after birth. A very young baby who bumps his head hard against the end or side of his crib may get such an injury.

In the early stages, the clots are fluid and can be sucked out by a needle inserted through small holes drilled through the skull. If the clots are not removed at this stage, a thick membrane of scar tissue will develop. Ordinarily, a baby's brain more than doubles in size

during the first two years of life. The thick, nonelastic membrane from the clot, however, will prevent the infant's brain from growing and thus doom the baby to feeble-mindedness.

More than 70% of the babies operated on have developed normally. In the rest, so much damage already had been done to the brain that the children are grossly retarded mentally.

The Boston doctors reported experience with 150 babies. They believe the condition is much more common than generally supposed, and they urged doctors to be on the alert for it.

Symptoms are not very specific, but doctors should suspect the condition, they said, in any baby who is not gaining weight, refuses feeding, has a slightly enlarged head and is very irritable. The babies may also have convulsions.

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The barrel-bellied tree of Brazil, the Brazilian *barriguda*, is found in the semi-arid northeastern district of the country; it conserves moisture in its enormously swollen trunk.



"THAT MOTHERS MIGHT LIVE"—This medical painting by Dean Cornwall had its premier showing at the American Medical Association convention in San Francisco. It shows Oliver Wendell Holmes, famous doctor and poet, reading a paper proving that childbed fever is contagious. Doctors were skeptical at first, but later became convinced, and as a result of Holmes' famous essay, childbearing was made safer throughout the world. Wyeth Incorporated, Philadelphia, commissioned Cornwall to do the painting for its "Pioneers of American Medicine" series.

ECOLOGY

Aftermath of Bomb Blast

Underwater explosion scheduled next. Scientists believe concrete is best protective structure. Surviving animals may still be in danger.

By DR. FRANK THONE

Science Service Crossroads Correspondent

See Front Cover

► THE UNDERWATER explosion planned for later this month at Bikini will have less heat and radioactive effects on the Navy's target ships, it is believed. Will its water-conveyed concussive effect rip open the bottoms of even the stoutest of warships? That is what we are waiting to see.

An atomic bomb, bursting in air near a well-built warship, even an old one, will not sink it, but it will so batter and blast its decks and upper works that little or nothing about them will be of any use afterwards, even in the unlikely event that any crew members were left alive in such exposed or thinly sheltered positions. That is the best judgment that can be reached after a view of the lagoon at Bikini after the atomic bomb blast.

On all ships within a half-mile radius of the target center, the upper works—masts, funnels, boats, bridges, ack-ack gun nests—are visibly knocked about from some distance away. A closer view shows more completely detailed ruin.

The picture on the cover of this SCIENCE NEWS LETTER, which is a Joint Army-Navy Task Force One Telephoto through Acme, shows the heavy cruiser, *USS Pensacola*, in Bikini lagoon after the blast with her superstructure severely damaged.

Outside this center circle of heaviest damage there is another half-mile zone of lesser, but still severe, wrenching and smashing, probably sufficient in many cases to put ships out of action at least temporarily.

The damage we saw at first was caused primarily by the bomb's blast or concussion. Its terrific heat started most of the fires; some of these, however, originated from secondary causes. The same heat would have aided concussion in killing exposed personnel.

The bomb's third effect, loading with radioactivity nearby water and all things exposed above it, may still be operating in parts of the target area.

An air explosion attack with an atomic bomb, therefore, can disable ships and kill or cripple their exposed personnel with its triple effect of concussion, heat and radioactivity. It will not sink large warships.

Concrete Protection

Concrete will be the best as well as the cheapest material for protective structures if we have to build against the risk of an atomic bomb war. Dr. Karl Compton, president of the Massachusetts Institute of Technology and chairman of the evaluation board of the joint chiefs of staff, told newspapermen aboard the *USS Apalachian*.

Dr. Compton was impressed, as were the newspapermen when they toured the target area, with the way two concrete craft had stood up under the blast. Steel ships all around them were heavily damaged, but a floating drydock and an oil barge built of concrete showed no cracks. The oil in the barge had burned, but the barge itself was not harmed and is still afloat.

Dr. Compton also called attention to the way certain modern concrete, earthquake-proof buildings in atom-blasted areas of Japan had survived.

As additional support for his idea: he pointed out that six feet of concrete is considered sufficient protection around the largest cyclotrons, and this should be enough to afford radiological protection against known kinds of atomic bombs. It would also be enough for protection against explosion blast except from very near hits.

Such shelters presumably would have to be made independent of outside air for ventilation, at least for some days, to prevent harm from radioactive contamination from that source.

Still in Danger

The animals that survived the atomic bombing are not safe yet. Despite the astonishing survival of these goats and pigs their troubles may just be beginning.

If their reactions are similar to those

of human beings, here is a list of diseases they may develop from having lived through the blast of an atomic bomb:

1. Anemia, due to the destruction of the parent cells of red blood corpuscles.
2. Leukopenia or agranulocytosis, resulting from an analogous suppression of white blood cells.
3. Purpura, a kind of bleeding that follows the destruction of blood platelets that aid in clotting.
4. Infections, that may invade the body through its weakened defenses.
5. Liver degeneration, resembling toxic hepatitis.
6. Degeneration of the sex glands in both the male and female; this, however, is not necessarily permanent.
7. Loss of hair, which again may not be permanent.
8. Cancer possibly, but data from Japanese explosion sites are not old enough or numerous enough to prove anything.

The animals that preliminary survey crews found when they went aboard the target ships are going to be watched carefully for quite a long time to see if any of the ailments on the list, supplied by one of my cabin-mates, Dr. William Hitzig of New York, develop.

On the whole the animals survived their little sample of hellfire most amazingly. On the old *Pennsylvania*, for example, 10 goats and 10 pigs had been left behind, and they were all found alive and in no apparent distress. On one of the transports, the story was almost the same, only one of the goats had died.

Most astonishing, however, was the score on the *Nevada*, the ship marked in red for the bullseye of the target. It had been a close hit too, for most of the red paint on her port side had been blasted black, much of her superstructure smashed and the lighter items of Army ordnance on her after deck had become piled-up junk.

Yet all the pigs and goats placed on her foredeck were alive and at least one goat had survived the moment of inferno near her stern, though he was reported sick.

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The *blackeye pea*, or bean, came from Europe to the American colonies at an early date; it was introduced into Virginia by George Washington, and called the cowpea by Thomas Jefferson, who believed it native to America because used by Indians.

AERONAUTICS

Unconventional Planes

Navy's new fighter plane, XF5U-1, and Army's Flying Wing have unconventional designs which eliminate body drag. Other new designs have revolutionary features.

► THE NAVY'S new turtle-shaped experimental fighter XF5U-1, now ready for flight tests, is as revolutionary in appearance as the Army's new Flying Wing.

Both are part of a new trend in airframe conformation to eliminate the body-drag of the fish-shaped fuselage of the conventional aircraft.

The new Navy plane has short dwarfed wings but depends for supporting lift in flight largely on its broad flat undersurface.

The Flying Wing is all wings. It is composed of two broad hollow wing-shaped parts joined in a wide-spreading V at their bases with space within them at the junction to hold crew and equipment.

There are many differences in the two planes. The Flying Wing's four engines are tucked away inside the wings on their rear edges and operate pusher propellers.

The Navy plane's two engines are prominently located at the outside corners of the craft's squared-off front with the puller propellers well forward. An important feature of this plane's power arrangement is that either engine can operate both propellers if one engine is backed out.

The new Navy plane, built by Chance Vought Aircraft, has range of speed from extremely slow to extremely fast. It may prove to be the world's fastest propeller-driven plane. It will have a speed range from 40 to 425 miles per hour with its present two-speed engines. With the addition of water-injection its range will increase to from 20 to 460 miles an hour. Later, with gas turbines, the top speed may approach 550 miles.

The British also are experimenting with revolutionary types of planes. A plane like the Army's Northrop Flying Wing is in advanced stages of construction. This English version will be jet-powered, it is reported, and will be able to cross the Atlantic in from seven to eight hours.

The Flying Ram XP-7A, also an Army Northrop plane of the Flying Wing type,

is a bat-like craft which the pilot operates lying down with a bullet-proof glass bubble over his head. In this prone position he can go through maneuvers not dreamed of in other types. It has now been flight-tested. It is designed for ramming enemy aircraft at speeds approaching the velocity of sound. It is constructed of magnesium with knife-like wings, and, because of the material used, its design and speed, it is almost invisible as it shoots through the air.

A rocket-powered plane, another craft of unconventional design, built for the Army by Bell Aircraft, is now ready for trial. It is designed to travel faster than the speed of sound. It has already been tested without engines by taking it to great heights and using gravity for power. It is rocket-powered so that it can travel at high altitudes where jet engines can not be used because of the lack of oxygen. It is the XS-1.

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PHYSICS

Guggenheim Awards for Atomic Control Study

► A STUDY of the domestic development and control of atomic energy will be made by James R. Newman, science chief for the Office of War Mobilization and Reconversion and adviser to the Senate Atomic Energy committee. Mr. Newman was awarded one of 12 post-service Guggenheim fellowships.

Dr. John Archibald Wheeler, Princeton associate professor of physics, will work on electron theory with Prof. Niels Bohr in Copenhagen under one of the fellowships.

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From Page 19

Myers, O'Mahoney, Overton, Pepper, Radcliffe, Russell, Swift, Taylor, Thomas, Utah; Tunnell, Wagner, Walsh.

Republicans for—(10)—Aiken, Donnell, Ferguson, Hart, Knowland, Langer, Morse, Smith, Wiley, Young.

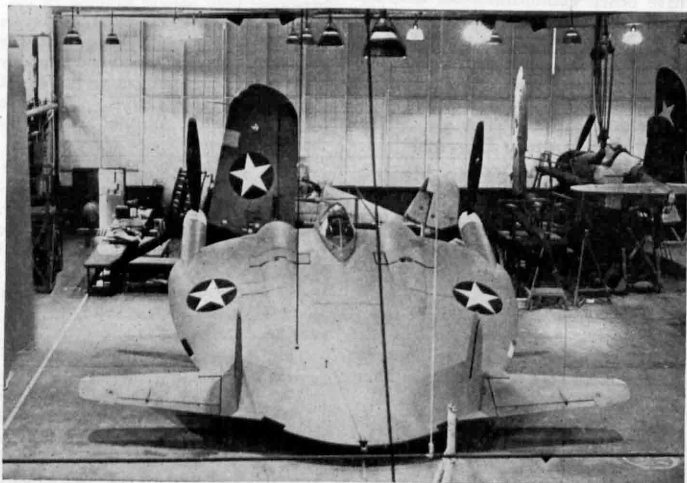
Progressives for—(1)—LaFollette.

Against the bill—18.

Democrats against—(2)—McKellar, O'Daniel.

Republicans against—(16)—Ball, Bridges, Brooks, Buck, Capehart, Capper, Gurney, Hawkes, Millikin, Moore, Robertson, Stanfill, Taft, Wherry, White, Willis.

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XF5U-1—The Navy experiments with new high-low speed fighter, developed by Chance Vought Aircraft. This revolutionary plane is being made ready for flight tests, and has as its chief new features the reality of extremely high and low speeds in the same plane, as well as one engine being able to turn over both propellers in the event of a failure.

DENTISTRY

Dental Records Would Identify Unknown Dead

► FEWER TRAGIC cases of unknown dead, whether soldier or civilian, would result if a system of identification through teeth were adopted, Dr. Lloyd G. Welty, of San Francisco, former lieutenant colonel in the Army Dental Corps, and Randall R. Glasgow, also of San Francisco, and a former Medical Administrative Corps captain, suggest.

Details of a system by which dental records could be translated into numbers to be punched on automatic machine record cards are reported by these two in the *Journal of the American Dental Association* (June).

Teeth are relatively indestructible and the teeth in no two mouths are exactly alike. Identification might be more difficult in the case of a person with a complete set of false teeth, or who had a complete set of perfect natural teeth. These difficulties could be overcome, however, by stamping the patient's full name into the false teeth and by casts taken of the natural ones.

Military services and insurance companies could apply the system almost immediately. Universal use throughout the nation would require that all persons have dental examinations but this, Dr. Welty and Mr. Glasgow point out, would be a great step toward extending dental service and education to the public.

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ELECTRONICS

High Frequency Current Detects Weakness in Metals

► WEAK SPOTS developing in metals at work in machines and cables, due to stresses and fatigue, can be located and replacements made before failure occurs by use of high frequency electricity.

How this is done was told to the American Society for Testing Materials by P. E. Cavanagh of Allen B. Du Mont Laboratories.

"High-frequency core losses can be used to detect incipient failure in metals where such failure is preceded by plastic deformation," he said. To determine the losses an instrument known as a cyclograph is used.

Inspecting a mine-hoist rope is one example of where this method may be applied. A hoist rope in good condition,

working at normal loads, will last indefinitely. However, corrosion, abrasion, bruising and kinking may seriously weaken a rope locally and give rise to failure.

Whatever the cause of failure, he continued, the unit stresses in the part of the rope where failure is started will be higher than in the rest. These higher stresses can be detected by the cyclograph because core losses are different where the higher stresses occur.

In practice, a cyclograph recording is made of the condition of the entire rope when first installed, and at definite intervals later. Tests must be made with a known load on the rope. Any variation from the standard recorded pattern at any point can be due only to the beginning of plastic deformation. The amount of variation determines if the rope is no longer safe for use.

"In order for any type of failure to occur in metal some permanent distortion of the crystal lattice must take place beforehand," Mr. Cavanagh stated. "This distortion will change the magnetic and electrical properties" and may be detected with the cyclograph.

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AERONAUTICS

Square-Tipped Propeller Resembles Windmill Vanes

► SQUARE-TIPPED propeller blades for aircraft, resembling in appearance the vanes of an old Dutch windmill, may become common on certain types of planes. Their use is a return to the shape employed by the Wright brothers in their early plane.

These square-tipped blades are the results of extensive studies in aerodynamics, and are designed to maintain high thrust as airplane speeds approach the speed of sound. Instead of being elliptical they are almost rectangular in shape, with extra width added at the tip. Their increased wideness is one of their advantages.

This shape, the designers claim, affords the maximum increase in blade power absorption with the minimum weight increase. The earliest version of the modern square-tipped blade was used on the North American P-51 Mustang, and an improved type will be used on the twin-engine Martin 202 and the Consolidated Vultee 240. The new blade was developed by Hamilton Standard Propellers division of United Aircraft Corporation.

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IN SCIENCE

TOXICOLOGY

Don't Mix DDT with Chewing Tobacco

► DON'T MIX DDT with chewing tobacco seems to be the moral of a report from Dr. M. I. Smith of the National Institute of Health in the *Journal of the American Medical Association*. (June 8).

A farm hand in the employ of Dr. Paul Bartsch of the U. S. National Museum accidentally did so and as a result was mildly poisoned.

The accident occurred because he carried a bottle containing a solution of DDT in kerosene in his pocket along with his chewing tobacco. The cork of the DDT bottle came loose and an undetermined amount of the insect spray got on the tobacco.

Without noticing the odor or taste of the kerosene, the man chewed a plug. Within two hours he became nauseated, vomited, suffered anxiety, and had stiff painful jaws. These last symptoms, which lasted for several hours, appear in Dr. Smith's opinion to be the counterpart of the overexcitability and muscular tremors and twitchings seen, especially around the head, in animals that have had a toxic dose of DDT. The man also had a sore throat which lasted two or three days.

Scientifically, the case is of interest because it shows, for the first time, what happens to DDT when it gets into the body of a man. Previous studies had been made on rabbits. Unchanged DDT, Dr. Smith found, was excreted by the kidneys.

Science News Letter, July 13, 1946

BIOCHEMISTRY

Prize for Plastics And Films from Blood

► RESEARCH leading to development from blood of fibrinogen plastic and fibrin tubes and films has won for Dr. John D. Ferry, 34-year-old assistant professor of chemistry in the University of Wisconsin, the \$1000 Eli Lilly prize for outstanding achievement in biochemistry. The award will be presented at the meeting of the American Chemical Society in Chicago in September.

Science News Letter, July 13, 1946

E FIELDS

ENGINEERING

Suction Flatiron Dries And Presses at Same Time

➤ **GOODS** too wet to iron with ordinary flatirons are quickly dried and pressed with a new household suction iron on which patent 2,402,575 was granted by the U. S. Patent Office. It involves the creation of a partial vacuum between the flatiron and the goods to remove the steam.

The face of this electrically heated flatiron has a number of small channels or grooves radiating out from a common center. A nipple extends through the ironing sole plate at this center with perforations for each channel. A suitable pump, located in the body part of the device, sucks up the steam that is generated from the hot sole and the material. The result is rapid drying followed by quick smoothing.

By a simple arrangement the pump and the heating elements are on the same circuit so that only one electrical connection to the house current is needed. The inventor is August C. Purpura of Chicago.

Science News Letter, July 13, 1946

MEDICINE

Atabrine Makes Toe And Finger Nails Glow

➤ **TOE AND** finger nails shine with a brilliant yellow-green light when a person who has taken anti-malarial doses of atabrine (quinacrine hydro-chloride) is exposed to ultraviolet light

This new test for this antimalarial drug widely used in the armed forces in the Pacific was independently discovered by three doctors and reported in the *Journal of American Medical Association* (July 6).

Dr. Julius E. Ginsberg, dermatology professor of the Northwestern University Medical School, Chicago, who had taken atabrine regularly for two years as an army physician in the tropics, noticed the fluorescence of his own fingernails when examining a child under Wood's light, as physicians call ultraviolet. Col. Paul L. Shallenberger of Gardiner General Hospital, also of Northwestern, had noticed similar fluorescence.

At the Mayo Clinic, Rochester, Minn., Dr. Robert R. Kierland noticed the intense fluorescence of his own fingernails. He had returned from the Southwest Pacific where he had taken atabrine daily for almost two years.

From tests upon hundreds of patients, some of whom had taken atabrine over long periods, Drs. Ginsberg and Shallenberger concluded that the greenish-yellow fluorescence can be used as a means of checking whether atabrine is being used as an antimalarial.

The temporary yellow discoloration of the skin, observed in many veterans who served in the tropics, and bluish pigmentation of the nails and palate following atabrine use, are not associated with the fluorescence.

Science News Letter, July 13, 1946

PHYSICS

Synthetic Fuels Demonstrated by Navy

➤ **WORLD'S LARGEST** consumer of oil, the U. S. Navy, has demonstrated how synthetic gasolines, diesel fuels and lubricants can be used successfully in ships and engines.

Announcing plans for a long term study of synthetic fuels in cooperation with the oil industry and engine manufacturers, officials at the Naval Engineering Experiment Station used fuels made from natural gas, shale, and coal to operate landing craft, amphibious tanks and an experimental gas turbine and turbo-jet engine. Both synthetic fuels and blends of synthetic with natural fuels were shown to be efficient in the tests.

The Navy's program of synthetic fuel study began in 1944 when laboratory experiments showed that high cetane diesel fuel could be made from natural gas blended with low quality natural fuel. The wartime shortage of high cetane diesel fuel was solved by other means, but the research on synthetic fuels was continued.

This demonstration, the first full-scale showing of synthetic fuels in the United States, included American petroleum manufacturers and one French firm, Kuhlman Company, which made diesel fuel from coal under a special contract with the Navy.

Postwar research on synthetic fuels is being continued by the Navy Cooperative Committee on Fuels and Lubricants.

Science News Letter, July 13, 1946

ASTRONOMY

Comet Brooks Spotted Near Predicted Position

➤ A **FAINT COMET** now to be seen through big telescopes in the constellation of Pisces, the fishes, is the periodic comet Brooks, returned again to earth.

The comet was located close to its predicted position on June 29, by Dr. Hamilton M. Jeffers of the Lick Observatory of the University of California.

When discovered, the comet was very faint, being of the 18th magnitude. It is expected to become brighter during the next month or so as it gets close to the sun, but will probably not be bright enough to be seen with the naked eye.

One of several comets expected to visit the region of the earth this summer, this comet was first discovered in 1889 by W. R. Brooks, great American comet-finder. It has been seen upon practically all of its return visits at seven-year intervals.

Nothing was reported about the tail of this comet, a small spot of brightness moving slowly across the sky.

The comet is expected to be brighter after perihelion passage on Aug. 25 than before this closest approach to the sun as it will be getting nearer to the earth. It will come within about 91,600,000 miles of our planet. On Oct. 27 it is expected to be in the constellation of Aries, the ram.

Science News Letter, July 13, 1946

ENGINEERING

New Synthetic Grease Can Replace Many Old Types

➤ A **BUTTERY**, light tan grease has been developed that can replace four aircraft greases required for use over an operating temperature range of 100 degrees below zero Fahrenheit to 300 degrees above. Believed to be usable over a wider range of temperatures than any other aircraft lubricant, this super grease was developed by the Texas Company at the request of the Navy.

Instead of being made from either a vegetable or mineral oil, the oily constituent is strictly a synthetic compound. This grease of many uses, that can be substituted for both easy pouring and thick varieties, has a lithium base. It will be used on all types of control bearings, actuators, aircraft instruments, aerial cameras and the fly-power motors in radar equipment.

Science News Letter, July 13, 1946

PHYSICS

Seeing With Heat Waves

"Sniperscope," infra-red receiver, converts invisible light into visible image, enabling objects to be seen and located in the dark.

By A. C. MONAHAN

► "HANDS UP or I'll shoot!"

This order pierced the dark of night, and the thief obeyed the order of the policeman who had surprised him.

"How did you see me breaking into the back entrance?" the prisoner asked. "I couldn't see where I was going myself."

The policeman told him he used his sniperscope.

Thanks to infra-red radiation and new devices for making use of this invisible heat-light, the guardians of the law will soon be using the same kind of applied science that tricked the Japs on Iwo and other tough, bloody islands.

For GIs in the closing months of the war could see in the dark, without being seen.

The sniperscope the policeman mentioned has a companion device called a sniperscope. In general they are identical. The first is a complete instrument held in front of the user by one hand. The other is in two pieces that are attached to a carbine.

Both have an infra-red lamp that sends out an invisible beam of what some call "black" light. Both have receivers that pick up returned light from the object observed and convert it from invisible light to a visible image. The object appears greenish in hue, but is plainly outlined.

Infra-red rays played other important roles in the war. They were used for the quick drying of protective coatings on tanks and soldiers' helmets, and for warming up engines in jeeps and trucks. They were also used in photography, enabling camera men high in airplanes to take accurate pictures of camouflaged enemy installations and ships at sea, and also to snap photographs through haze.

They were used to detect impurities in certain chemical solutions, and in medical treatment. Both Japs and Germans employed them in a short-range system of telephonic communication where wires could not be used and radio would be detected.

Peacetime Uses

Peacetime applications of infra-red rays in drying, heating, medicine, chem-

istry and photography are self-evident. Scientists are developing their use in communication systems. Even the sniperscope has possibilities, particularly in navigation.

Infra-red equipment was successfully used by the Navy during the war. Vessels used the "black rays" in signalling to each other. The signals could be picked up only by ships equipped with receivers similar to those on the sniperscope.

Also naval boats hung infra-red lamps on their masts at night which gave all vessels in a formation the location of every other ship. This system is usable on commercial ships. Sniperscopes can be used by ship lookouts without the usual eyestrain, and by river pilots who with them can be certain of river banks and obstacles ahead.

Scientists talk about so many different "rays" these days that the layman is often confused. Infra-red rays are often called thermal or radiant rays because heating power is an important characteristic. The length of the waves with which light and invisible energy rays travel through space is their distinguishing feature. Cosmic rays, gamma or radium rays, X-rays, ultraviolet rays, visible light rays, infra-red rays and electro-magnetic rays are merely rays of different wavelengths.

Visible Rays on Human Eye

The rays that form pictures on the retina of the eye are the so-called visible rays, but even they include rays of different wavelengths. When a beam of white light, such as that from the sun, is passed through a glass prism onto a screen, a spectrum or band of colors is formed on the screen. That is because the rays of various lengths are not bent the same amount in passing through the glass. The shorter the wave, the more it is bent away from a straight line.

The visible spectrum of white light includes violet, indigo, blue, green, yellow, orange and red, each shaded off into the next. Color is a matter of wavelength. The red has the longest wavelength of the visible spectrum, the violet the shortest.

Visible light rays, however, form but a tiny portion of the entire spectrum. There are invisible rays with wavelengths much longer, and others much shorter, than those we can see. Those shorter



Bell & Howell Photo

SNIPERSCOPE—Used by the Army and Navy for night operations, this instrument converts invisible light to a visible image.

than the violet are the ultraviolet, X-ray, radium and cosmic rays in the order named. Longer than the red wavelengths are the infra-red waves, short radio waves and then the long radio waves.

All waves, regardless of their length, may be absorbed and their energy converted into heat. But the infra-red waves result in more heat than the color waves. That is how they were discovered. A scientist, nearly 150 years ago, taking temperatures in the visible spectrum, found that beyond the red higher readings prevailed. He concluded, therefore, that at that point there must be invisible rays.

Enemy Systems Similar

The German and Japanese systems of using infra-red rays to communicate across wide rivers, deep gorges and to front line troops were similar. German equipment, captured in 1944, was brought to America for study and testing. It is able to convert spoken words into modulated infra-red rays and send them through space for several miles to a receiver which picks up the invisible light and turns it back into speech.

The scheme is not new. Alexander Graham Bell used it in 1880 in his telephone, and the principle had application in World War I. The Nazi instruments used varied in weight from 30 to 210 pounds, exclusive of their power units, and resembled searchlights on tripods. They had a range of 10 miles under good conditions. The receiver had to be in the line-of-sight, because infra-red rays, like ordinary light rays, travel in straight lines.

The sniperscope, attachable to the carbine, has one part under the barrel and one over. The under part is the tube containing an infra-red lamp. The face of the tube is painted black so that no visible light can escape. The upper mounting is a special telescope, the receiver for the reflected rays. Both are powered from a supply unit carried on the user's back which contains a six-volt battery and a vibrator.

The transformation inside the telescope receiver that receives the reflected invisible rays and makes a visible image is brought about by the use of electrons inside the tube of the instrument. The reflected infra-red rays picked up on the objective lens are focused on an image tube. When they strike this image tube, electrons are released in direct proportion to the intensity of the rays.

As all electrons possess a negative electric charge, the released electrons are attracted to a positive plate. They are accelerated as they pass through the tube to a fluorescent screen. They bombard the screen and produce a visible image corresponding to the invisible infra-red image on the front screen. The power for action is from the vibrator.

The usual snoopscope is carried by hand in front of the user, but there is another kind. In this the device to shoot out the infra-red beam is mounted on

the front of a jeep or tank and the driver is equipped with head-gear, a so-called infra-red-sensitive helmet, with the receiving telescope attached to its visor.

The infra-red lamp used in the snoopscope consumes five amperes at six volts. The receiving tube requires 4500 volts, which is supplied by the vibrator in the power supply unit.

Nazis, as well as Allies, had an infra-red night-seeing instrument called a "heat-eye tube." It (Turn to next page)

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Do You Know?

Spring shrubs are best pruned just after the blossoms fade.

Bacteria are found at greater depths in soil or in ocean muds than any other living animals.

Dinosaur remains have been found on every continent but always in deposits of the Mesozoic age.

Breaks in the bark of *dogwood trees* should be treated promptly with paint or shellac to keep out woodboring insects.

New process in *sugar making* from beets or cane, that uses ion exchange resins, saves costs, increases the amount of sugar obtained, and yields a sugar syrup edible by humans instead of the former "blackstrap."

Carnauba wax, used to polish floors, furniture and automobiles, is obtained from a South American tree that yields well only in semi-arid regions; the wax is a natural secretion during dry periods to protect the leaves.

The *thickness* of thin glass with parallel faces can be determined by the reflection of light: a tiny beam of light striking the glass is reflected from both surfaces and the thickness determined by measuring the displacement of the two images.

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From Page 27

was a mass-produced cathode tube powered by a midget generator.

With it the Germans used a searchlight with the lens painted out to block the emission of any visible light. In the receiving heat-eye tube, the reflected heat-image fell on a selenium film and dislodged electrons were drawn magnetically through a vacuum tube and focused directly on a fluorescent view-piece. American scientists, however, are working out improved snooperscopes, and also better methods of using infra-red rays in telephonic communication.

Super-Sensitive Eye

A super-sensitive, super-conductive bolometer, developed at Johns Hopkins, was used in recent experiments in sending heat signals over telephone wires from Baltimore to Atlantic City. A bolometer is a delicate heat detecting or measuring instrument.

This bolometer, a delicate infra-red "eye," contains metal strips whose electrical conductivity is altered by heat waves falling on them. When hit by a heat ray that warms it only one millionth of a degree, it gives a clear electrical signal. It can register the heat from a living person 500 yards away, and when attached to a scanning device, a television-type viewing screen, can produce a rough picture of any warm object.

In this bolometer, columbium nitride is used for its sensitive receiving surface. This rare-metal nitrogen salt is cooled by the use of liquid hydrogen to 432 degrees below zero Fahrenheit, at which temperature its electrical resistance is exceedingly low. For this reason, it is superconductive. In the Baltimore experiment, heat rays from various objects, and from a man, were picked up by the bolometer, and the variations transformed into sound.

When it is remembered that every object hotter than its surroundings gives off radiant heat—infra-red rays—special uses of a delicate bolometer become apparent. As examples, heat escapes from a building can be detected, or a distant aircraft with its hot engine or propelling jet, or again, the extremely hot flame and tail of a rocket even scores of miles away.

Science News Letter, July 13, 1946

Hydrogen for meteorological balloons was obtained by the Army during the war from a sodium borohydride compound and water by the addition of an acid-forming compound, such as boric acid, or by certain catalysts.



NIGHT EYES—This RCA Type 1P25 infra-red light tube was the eye of the electron telescope used by the Navy to conduct landing, reconnaissance and offensive operations as well as code communication by blinker lights under cover of absolute visual darkness.



Photo Courtesy Ohio State Univ.

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War came, and with it the sudden need for a conveyor of the powerful microwave pulses of radar. The

metal waveguide was the answer. Simple, rugged, containing no insulation, it would operate unchanged in heat or cold. In the radar shown above, which kept track of enemy and friendly planes, a waveguide conveyed microwave pulses between reflector and the radar apparatus in the pedestal. Bell Laboratories' engineers freely shared their waveguide discoveries with war industry.

Now, by the use of special shapes and strategic angles, by putting rods

across the inside and varying the diameter, waveguides can be made to separate waves of different lengths. They can slow up waves, hurry them along, reflect them, or send them into space and funnel them back.

Bell Laboratories are now developing waveguides to conduct microwave energy in radio relay systems, carrying hundreds of telephone conversations simultaneously with television and music programs.

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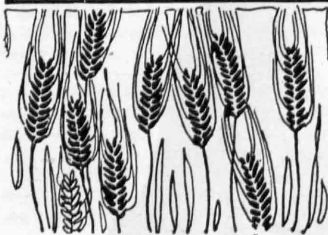


BELL TELEPHONE LABORATORIES

BOTANY

NATURE RAMBLINGS

by Frank Thone



The Greatness of Grasses

► GRASS, the type and symbol of weakness and impermanence in more than one Biblical poem and parable, is nevertheless solid material foundation on which all civilization is based. For civilization began after men learned to be farmers, and had no further need to follow the nomadic, unsettled life of a hunter. Farming, and the city cultures that grew out of it, has always been primarily a growing of grain—and all grains are grasses. There have been at least three independent origins of farming in the history of the world, and each

one took place in connection with a grain culture: barley and wheat in the Near East, rice in southeastern Asia, maize or Indian corn in tropical America. Nobody knows when or precisely where some primitive groups of half-savages began purposely to plant the grains they had previously gathered casually from the wild state, and so established the first permanent villages, that later grew into towns, then cities, where division of labor and a release of at least a few of the people from the constant necessity to concern themselves with the immediate production of food permitted the growth of the arts and the development of learning.

Not only have the high civilizations been founded on cultivated grasses, the marginal cultures, based on a pastoral way of life, have been dependent on grasses as well—usually, of course, the native uncultivated species. Wherever shepherds have driven their flocks and cattlemen tended their herds, grass has been of vital importance, and pasturage rights the subjects of conflicts and treaties. This was true in the days of Abraham; it is still true in the American West.

In the tension zones between the tall-grass country that is the natural site of highly developed agriculture and the drier short-grass country that is good only

for grazing, another group of grasses makes possible a more precarious type of agriculture—the millets, sorghums, Sudan grasses and other coarse, lusty, drought-resistant plants that are more dependable than wheat or even barley on such lands as our own High Plains, and Inner Mongolia, and the South African Veldt. Their stalks and leaves make fodder, their seeds are sometimes ground as grain. They woo the herdsman away from his nomadic life and begin to make a farmer of him.

Other grasses besides grains are of high importance to man. Bamboo is the universal building material in all the rice-eating lands; its shoots and sometimes its seeds serve as food as well. Sugarcane, another giant grass, has been the basis for any number of tropical colonial empires. Sod huts in our Western pioneer days were only a temporary and makeshift device of American living; but grass huts, and grass-thatched houses, permanently shelter millions of the earth's inhabitants.

Science News Letter, July 18, 1946

CHEMISTRY

Synthetic Egg White Made from Codfish

► EGG WHITE, exclusively a hen product for centuries, now has competition in a German synthetic substitute made from fish. For a decade or so this fish product was kept a secret, but postwar American investigators found it, analyzed it, ate it, and say that it has only a very slight fishy flavor.

The investigators learned that it has been used successfully for food and technical purposes in Germany since 1934. It is made from fresh codfish but can be made from dried codfish or steam-dried shrimp. It can be used the same way as egg white and is said to have superior whipping qualities. Being about 94% protein, it has excellent food value.

This synthetic egg white is made by a process that involves removing readily soluble proteins in the fish with dilute acetic acid and extracting fats with trichlorethylene. The extracted tissue then is stirred in warm dilute sodium hydroxide, and the partly hydrolyzed protein is neutralized with acetic acid and sprayed into a white powder.

Complete information on this synthetic substitute for egg white is given in a report issued by the Office of the Publication Board, U. S. Department of Commerce.

Science News Letter, July 18, 1946

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Books of the Week

AIRPORT PLANNING—Charles Froesch and Walter Prokosch—*Wiley*, 250 p., tables and diagrs., \$7.00. An analysis of basic problems in airport planning and design, presented from a functional viewpoint.

ATOMIC ENERGY IN INTERNATIONAL POLITICS—Harold C. Urey—*Foreign Policy Assn.*, 11 p., paper, 25 cents. *Foreign Policy Reports*, Vol. XXII, No. 7.

BIOLOGY FOR YOU—B. B. Vance and D. F. Miller—*Lippincott*, 731 p., tables and illus., \$2.28. A textbook for use in the high school. The authors have endeavored to include material which will be directly related to the past experiences and future needs of the individual, and to inculcate principles of scientific thinking.

THE GENUS BAZZANIA IN CENTRAL AND SOUTH AMERICA—Margaret Fulford—*Chronica Botanica*, 175 p., diagrs., paper, \$5. A critical monograph of one of the most interesting genera of liverworts. *Anales Cryptogamici et Phytopathologici*, Vol. III.

THE GREAT STALIN FIVE-YEAR PLAN—*Embassy of the Union of Soviet Socialist Republics*, 56 p., illus., paper, free. The plan for the restoration and development of the national economy of the USSR for 1946-50.

THE INDIANS OF THE SOUTHEASTERN UNITED STATES—John R. Swanton—*Government Printing Office*, 1050 p., tables, illus., and maps, paper, \$2.75. Sketches of the Southeastern tribes and their population, with chapters giving details of their many customs and activities. Smithsonian Institution, Bureau of American Ethnology, Bulletin 137.

LECTURES ON PSYCHOANALYTIC PSYCHIA-

TRY—A. A. Brill, M. D.—*Knopf*, 292 p., \$3. Lectures which were originally given by Dr. Brill at the New York Psychiatric Institute from 1926 to 1942, explaining the history, meaning, and applications of psychoanalysis.

MEDICAL EDUCATION AND THE CHANGING ORDER—Raymond B. Allen—*Commonwealth Fund*, 142 p., \$1.50. A book about the development of medical education, showing how it is an integral part of the whole educational process from childhood to retirement from active life, and pointing out some of the difficulties of present-day medical training and suggesting possible ways of overcoming these inadequacies.

PSYCHOLOGY OF INFANCY AND EARLY CHILDHOOD—Ada Hart Arlitt—*McGraw-Hill*, 475 p., illus., \$3.75, 3rd ed. The principles of child psychology given a scientific and practical treatment, with emphasis on the actual behavior of children and interpretation derived from case studies. This new edition covers major researches of the past 14 years.

SUN, MOON AND STARS: Astronomy for Beginners—William T. Skilling and Robert S. Richardson—*Whitelsey House*, 274 p., illus., \$2.50. A simply written book especially for teen-age readers.

THROUGH THE STRATOSPHERE: The Human Factor in Aviation—Maxine Davis—*Macmillan*, 253 p., \$2.75. A record of the evolution and use of a vast number of devices evolved by the air forces for enabling men to be healthy and comfortable in the air.

Science News Letter, July 13, 1946

militarism as ever existed, but in only a few hundred years Denmark, Sweden and Norway have developed a non-militaristic type of culture which ranks among the highest of any of the cultural patterns in the world.

"It is possible, therefore, to alter cultural patterns rapidly. In any attempt to build a culture in which man can get along with his fellowman and in which war will not be acceptable, certain concepts are fundamental. These, as I have stated before, are that any nation or culture is a collection of individuals, and depends upon the mental health and mental attitudes of these individuals for a healthy cultural pattern; that our first problem is suitable education of children, and that we must teach children to think clearly and logically, to face reality and to try to deal honestly and frankly with their problems."

Science News Letter, July 13, 1946

ENGINEERING

Stabilizer Promises Smooth Train Riding

➤ TRAIN passengers will have smoother rides, no matter how bad the road bed, thanks to an improved mechanical stabilizer. Working on the principle of a big spinning top, it tilts the body of the railway car at the proper angle on curves and stops sway on rough track.

Recent tests over a wide range of speeds and road-beds show great improvement in riding comfort when using this instrument, designed by Westinghouse laboratories. It utilizes a refinement of a gyroscopic stabilizer.

Designed to balance the effect of centrifugal forces, the device uses an auxiliary gyro that eliminates undesirable vibrations. It is an outgrowth of the gyroscopic tank-gun stabilizer that enables gunners to fire with great accuracy when speeding over rough ground.

Science News Letter, July 13, 1946

Good Advice to Sick World

➤ Rx FOR EVERYONE in a world threatened by war, strikes, famine and atomic bomb annihilation: Stop being an ostrich.

This, in effect, is the psychiatric prescription given by Dr. Karl Bowman, of the University of California Medical School, in his address to the American Psychiatric Association in Chicago.

"We have to a considerable degree," he stated, "a cultural schizophrenia which tries to avoid the unpleasant problems of the world by denying their existence. At the present moment when the threat of the atom bomb is such that even complete annihilation of the world is a possibility, there is a very considerable percentage of individuals who insist that it is childish to be concerned."

In other words, there are many people acting like ostriches sticking their heads in the sand, or like victims of the mental disease, schizophrenia, who retreat into

a dream world when the real world becomes too unpleasant.

Psychiatry cannot work miracles, in spite of the impression current novels and moving pictures give, Dr. Bowman cautioned. It cannot cure every mentally sick patient. But it has learned much about how they got sick and how such sickness can be avoided.

"Psychiatry has much to offer the world at this time," Dr. Bowman declared. "It can point out that the present suspicion and sensitivity among nations is in many ways comparable to that among individuals; that building up the mental health of individuals is the best way to build up national health.

"There are those who say that Germany and Japan are hopelessly militaristic, but there are some nations which have been extremely militaristic in the past but have changed. The old Norsemen were as pronounced an example of

by
W. H. GEORGE

THE SCIENTIST IN ACTION

A SCIENTIFIC STUDY OF HIS METHODS

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•New Machines And Gadgets•

❁ **CASTING REEL** for fishermen operates on precision ball bearing and is claimed to be the first of its kind ever developed. Gears, spool shaft and level wind worm all revolve on self-retained precision-ground instrument bearings which are sealed in a housing to protect them from sand and grit.

Science News Letter, July 13, 1946

❁ **SPRING SEAT** for the locomotive engineer combines a double-action, hydraulic shock absorber, variable spring and sway bar to protect the operator from the engine's jolts and jars. Its coil spring and the spring action is controlled by the shock absorber, and the sway bar reduces side motion.

Science News Letter, July 13, 1946

❁ **DUST PRECIPITATOR**, an electronic device, for installation in duct systems of industrial air-circulating and air-conditioning installations, frees offices, theaters and other buildings of air-borne dust and smoke. Small individual floor units, to be available later, will operate on household current.

Science News Letter, July 13, 1946

❁ **TOBACCO PIPE**, following engineering principles, has cooling fins around the stem that keep the smoke cool and sweet. Other engineering features prevent mouth moisture from making "goo" inside the stem. It has free and unobstructed draw, it is claimed, and is the "world's driest pipe."

Science News Letter, July 13, 1946



❁ **LAWN MOWER**, a 30-inch power operated machine, cuts and trims at the same time at a rate of a half acre per hour. The two horizontal circular cutting disks, shown in the picture, can cut close to a tree or fence post, and can be adjusted to cut high or close as desired.

Science News Letter, July 13, 1946

❁ **PASTEURIZER** for milk, two-gallon capacity, for use in homes where the commercially pasteurized product is not available, operates on the ordinary house electric current. It provides automatic timing and temperature control, and heat-

ing features comparable to larger commercial units.

Science News Letter, July 13, 1946

❁ **COOLING UNITS** for individual rooms in homes and office buildings are placed in windows to cool, filter, dehumidify and ventilate the air in the rooms. Each unit is housed in an attractive case, and is intended for home owners in low income brackets.

Science News Letter, July 13, 1946

❁ **PASSENGER RAMP** for airplanes is adjusted like an extension ladder to the proper plane-door level. It is made of aluminum, mounted on rubber tires, and weighs 875 pounds. Fully extended, it has 15 steps and two landings. By means of a single hand crank the top section slides under the lower section.

Science News Letter, July 13, 1946

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