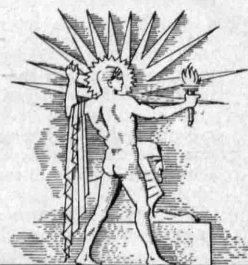
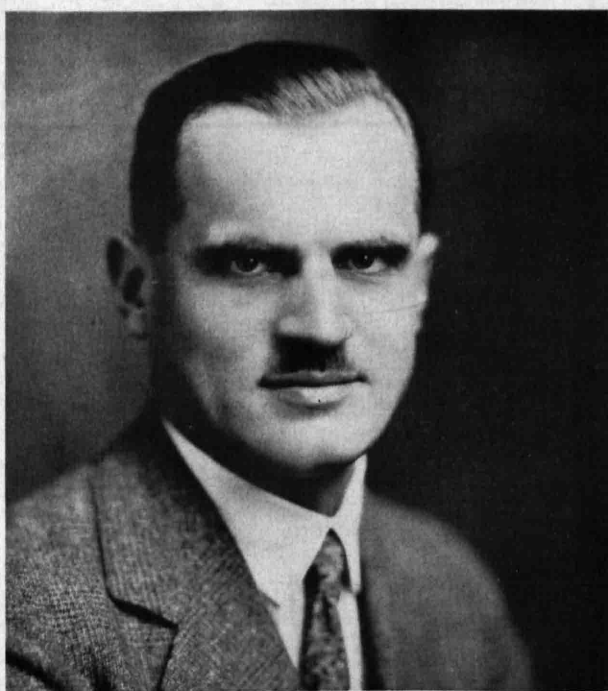


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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE.



January 10, 1942

President, A. A. A. S.

See Page 20

A SCIENCE SERVICE PUBLICATION

Do You Know?

The Museum of Modern Art in New York is exhibiting an *emergency type house* suitable for barracks, defense housing, or beach guests, consisting of two connecting cylinders of corrugated steel.

A man sitting at ease *breathes* 7.5 quarts of air a minute, whereas walking he breathes 21 quarts, mountain climbing 35, and swimming 45.5.

Four-H club members in New York State have collected a ton and a half of *seed* to help relieve a shortage of nut and evergreen seedlings in the state.

High-flying pilots combat a "*blackout*"—loss of consciousness—in too-sudden maneuvers by leaning far forward and tightening stomach muscles.

It helps British *morale*, says an American official, if American foods are plainly marked with some such label as "Food from America."

The *poinsettia* is named for Dr. Joel Poinsett, who brought the plant to the United States from Mexico in the early nineteenth century.

The American Red Cross has sent China two tons of cyanogas in powder form, to poison rats and fleas that are spreading *bubonic plague*.

New York's *Children's Zoo* is designed at the four-foot eye level, and adults have to stoop to enter.

The weight of a dozen *eggs* may vary as much as 10 or even 15 ounces.

SCIENCE NEWS LETTER

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QUESTIONS DISCUSSED IN THIS ISSUE

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SOCIOLOGY

How can juvenile delinquency be predicted? p. 23.

In Army language, a *butment* is a standard sleeping tent frame made more house-like by shingle roof, plastic screening and plywood shutters.

Built in the Panama Canal Zone 15 years ago, a house of pine pressure-impregnated with zinc chloride is resisting *termites*.

At one Michigan fort, *Army training* includes lessons in woodcraft, scouting, property locating and trail blazing.

Mink are not easy animals to catch because, while they cannot travel fast, they can dodge and twist with remarkable flexibility.

In spite of official efforts to grow more *rice*, Japan's rice crop is reported below average.

When the *Labrador duck* vanished from America in the 1870's, not even scientists realized that the species was disappearing.

Chemists have produced "self-cleaning" *house paints*, which remove dirt layers by the action of rain, wind, and sun.

Although Florida entered the *sponge industry* as recently as 1905, it is now the world's largest producer of sponges.

The human eye reaches its full size when the individual is about 10 years old.

After a cold snap, lemon trees produce *lemons* with more seed, says a Federal plant scientist.

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PHYSIOLOGY

Study of Effect of Pressure On Enzymes Wins Prize

Award of American Association for Advancement of Science Goes to Trio Who Studied Glowing Bacteria

FOR explaining how pressure enables the life-driving chemical compounds known as enzymes to do their work even when drugged with narcotics like alcohol and ether, three physiologists were awarded the annual thousand-dollar prize of the American Association for the Advancement of Science.

The three scientists are Prof. Frank H. Johnson, of Princeton University, and Prof. Dugald E. S. Brown and Prof. Douglas A. Marsland, of New York University. The prize, an annual gift of an anonymous benefactor, is awarded each year for an outstanding paper presented at the Association's midwinter meeting.

The three researchers did their work on the enzyme that causes the weird, unearthly glow given off by bacteria and other lower organisms, but the principles involved apply to enzyme action in general. It is believed that their explanation gives clues to the solution to a very wide range of biological problems, all the way from why pressing your upper lip will stop a sneeze to how the sulfa drugs act in weakening bacterial infections.

Light production by bacteria and other living things is caused by the action of an enzyme called luciferase on a compound known as luciferin. If alcohol, ether, chloroform or any one of several other drugs is added to the mass of glowing bacteria, they "go out like a light." They will go out similarly if too much heat is applied.

When bacteria thus blacked out by poisoning were put under the high pressure of a hydraulic pump, the light came back. When the pressure was lowered, out it went again. The light could be switched on and off at will, with strokes of the pump. It is what physiologists call a reversible reaction. A great many of the common life processes, such as muscle-building and muscle-decay, belong to this class of reversible reactions. Because their explanation appears to apply to all of them, the work of Profs. Johnson, Brown and Marsland is considered important.

As they see it, the effect of pressure is simple and direct. The reactions go in one direction when the molecules of the substances involved are large, and reverse themselves when the pressure forces them to become smaller.

Science News Letter, January 10, 1942

PUBLIC HEALTH

Cotton Rats Provide New Weapon Against Typhus

A NEW weapon has been discovered for fighting typhus fever, a disease currently reported to be plaguing the Nazi forces on the Russian front and to be stalling Nazi plans for a drive through Spain to the Mediterranean.

A laboratory animal in which the disease can be reproduced as it occurs in man has been found in the cotton rat, Dr. J. C. Snyder and Dr. C. R. Anderson, of the Rockefeller Foundation, announced (*Science*, Jan. 2).

One of the outstanding difficulties that has hampered scientific efforts to learn more about the disease so as to find a way of conquering it has been lack of such an animal.

Young cotton rats, the Rockefeller scientists now report, died within three or four days after injections of typhus fever germs, some of which were obtained six months ago from patients in a recent Madrid epidemic. Blood serum from patients two weeks after recovery from typhus protected other young cotton rats from killing doses of typhus fever germs.

Some of the tests showed that a still more susceptible animal is needed, the scientists point out, but their experiments show "that the cotton rat is much more suitable than the guinea pig for the investigation of many problems in typhus fever which urgently await solution."

A Mexican scientist, Dr. Gerardo Varelo, meanwhile had been testing the susceptibility of these animals to mouse typhus fever germs, finding that the germs lived in the brain of the cotton rat but did not make the animal sick.

Science News Letter, January 10, 1942



DUCK-BILLED DINOSAUR

This new model of a hooded duck-billed dinosaur, introduced to scientists at the meeting of the Society of Vertebrate Paleontology at Boston by Dr. C. M. Sternberg, of Canada's Bureau of Geology and Topography, is the first model of a dinosaur in which the external covering is the actual cast of known skin impression. It is based on a splendidly preserved, uncrushed skull. The mouth was made small, Dr. Sternberg said, because there must have been cheek pouches to retain the vegetation as it was shredded by the magazines of teeth.

GEOLOGY

Glaciers Had Own "Scorched Earth" Policy

ON THE "scorched earth policy," the glaciers which invaded North America a million years before the birth of Christ could teach even the Russians a thing or two, according to a report by Prof. R. F. Flint, of Yale University, to the Geological Society of America, in Boston.

"Whereas the Soviets burn the standing crops on the rich soils of Russia the great ice fields took along the soil itself down to bed rock," Prof. Flint said. He described to the meeting the first glacial map of North America, a cooperative scientific venture directed by twelve American geologists and four Canadians. Each inch on the map represents 60 miles and the vast area covered by the finished map will require seven feet from north to south.

Science News Letter, January 10, 1942

PHYSICS

Professor Arthur H. Compton New President A. A. A. S.

University of Chicago Physicist Is Famous for His
Discovery of "Compton Effect" and Cosmic Ray Nature

See Front Cover

MANIPULATION of a block of paraffin and some X-rays first brought fame to Dr. Arthur Holly Compton, University of Chicago's cosmic ray researcher and Nobel Prize winner, just elected president of the American Association for the Advancement of Science for 1942.

It was with this apparatus that the "Compton Effect" was discovered. This showed that light consists of little bundles of waves—quanta—that have mass (or weight) and momentum. When an X-ray bounces off a free electron to one side, its waves are lengthened, contrary to the classical theory. The electron and the light quantum bounce off each other exactly as two elastic billiard balls would. The quantum loses some of its energy in pushing the electron — is slowed down — and in quantum me-

chanics this means that its waves are lengthened.

This change in wave length can be explained in no other way. This discovery put the quantum theory squarely on its feet and was the starting point of the whole series of brilliant discoveries that have since been made in this field, which holds out the hope that we may some day run engines with atomic power.

No less important is Dr. Compton's discovery that the primary cosmic rays, as they come in from outer space, are heavy charged particles, probably mostly protons, rather than rays similar to X-rays, as was first supposed. Decisive evidence for this was the variation of the cosmic ray intensity with the magnetic latitude and the altitude above the earth, which was investigated all over the globe and at all attainable heights above it, notably in recent years at Mount Evans, 14,000 feet high.

Science News Letter, January 10, 1942

ARCHAEOLOGY—ANTHROPOLOGY

Archaeologists Can Help War Effort By Skill With People

And War Can Contribute to Science if Archaeologists
Use Military Cryptography To Read Ancient Records

AMERICA'S younger archaeologists who have shelved their spades because war prevents digging up ruins of ancient civilizations overseas have a fairly simple problem in helping the United States' war effort, says the Dean of Harvard University. Prof. George H. Chase.

"Their training in languages and in the art of dealing with people will make them useful in many ways," Prof. Chase stated before the Archaeological Institute of America, meeting in Hartford.

Propheying the war-time future of classical archaeology, Prof. Chase foresees smaller classes of students preparing to study the past. In World War One,

he stated, "the Harvard School of Architecture was reduced ultimately to two students—one a cripple and the other a Chinese," which suggests the immediate future of graduate school departments dealing with subjects little related to war and defense.

For older students trained in archaeological research, Prof. Chase suggested: "The best that we can hope for is to make ourselves useful by taking up the duties which are of necessity laid down by younger men and women."

Archaeologists were advised to forge ahead with studies of material unearthed in expeditions, and with publication of results.

Looking farther ahead, Prof. Chase pointed out that the United States may have to serve with other democracies as a spiritual center for the world, as well as a granary and stock pile, when war is won. Likelihood that America's own archaeologists and its refugee foreign scholars will find doors open to them for digging up ruins in Greece, Italy, Turkey and other Mediterranean lands was forecast.

Science News Letter, January 10, 1942

Use War Cipher Methods

THE WAR science of deciphering secret cipher messages must be borrowed by archaeologists, if they hope to solve the mystery of ancient records left by the civilization of Crete, Dr. Alice E. Kober of Brooklyn College declared.

Cipher experts of the War Department daily prove that it is possible to translate a document written in unknown script and in an unknown language, under certain circumstances, Dr. Kober emphasized. Requirements for deciphering are a long document or enough different examples of the system of writing, together with a thorough analysis of the system and some information about the language involved.

Archaeologists have long endeavored to decipher the masses of ancient government records unearthed in palace ruins on the island of Crete. It is believed that most of the records deal with taxes, property and other bookkeeping activities of this fallen international power of the ancient Mediterranean world.

Science News Letter, January 10, 1942

ARCHAEOLOGY

Ancient Greeks Used Convoys in War and Peace

CONVOYING ships in wartime is nothing new. Ancient Greeks sent battleships on this duty as a regular war custom, J. C. Plumpe of Washington, D. C., told scientists attending the American Philological Association, meeting in Hartford.

Ancients also knew the necessity of policing sea lanes and convoying merchantmen in peacetime, when pirates and privateers swarmed the seas, he added.

Study of ancient writings even shows types and numbers of ships used in convoys 2,000 years ago, he reported. Sometimes one armed ship was thought adequate. After one Roman fleet disaster, in 249 B.C., first 60 war vessels were sent to the rescue, and then 120 more units, in order to convoy about 800 transport vessels.

Science News Letter, January 10, 1942

PHYSICS

Einstein Drives Final Rivet In Relativistic Universe

Gravitational Theory, Which Formerly Applied Only
To Certain Cases, Now Broadened To Be Universal

PROF. ALBERT EINSTEIN drove the final scientific rivet in the relativistic universe which he began to build more than two decades ago to replace the edifice erected by Newton.

Physicists travelled to Einstein when the American Physical Society in convention heard him report this final development of his gravitational theory at the Institute for Advanced Study where he almost lives and does his work.

Previously, Einstein had been able to prove his gravitational theory only for certain special cases. Now the structure is completed by a perfectly general and rigorous mathematical proof that it applies in all cases.

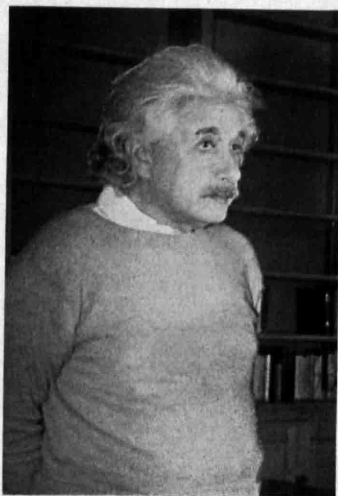
In his paper, it is rigorously proved, from the equations of the theory of general relativity, that there do not exist any gravitational fields of finite total mass which are free from singularities (i.e. which are finite at every point).

Until now this was proved only for fields with certain symmetry properties.

Scientists have ceased to discuss whether relativity is true or not. It is accepted and applied in all branches of physical science. Especially in atomic physics, its triumphs have been great. The conversion of mass into energy accounts for the heat of the sun and the long life of the stars. The hope of atomic power rests on the same basis. These are but two of its accomplishments.

The silver-haired Einstein, now 62 years of age, proud of his American citizenship, is the world's most distinguished refugee from the Nazi horror. He was in New York early in 1933, on his way back to Germany after a visit to California scientists, when Hitler and his cohorts swept into power. Since then he has remained, and it is hoped will long remain America's Einstein.

Science News Letter, January 10, 1942



EMINENT

Albert Einstein, clad in sweater and slacks, standing in his office at Princeton University, is considered the world's greatest mathematician. Despite the war, scientists are interested in the latest formulation of his gravitational theory.

Mudd, of the University of Pennsylvania.

To make this new test, whooping cough germs are disintegrated by the vibrations of intense sound, so as to remove the outer covering of the germs. The poison from the inside of the germ is what makes the patient sick, but the outer covering is the part of the germ against which the body's front line fighters must act in order to stop the germ invasion.

When a tiny bit of this outer covering of the germ is injected into the skin, a person who has plenty of whooping cough fighters, called antibodies, will develop a red bump like those in hives. If he does not develop this red wheal, he is susceptible to whooping cough because he has not enough antibodies to fight off the germs. If he is susceptible to the disease, his doctor can go on injecting a tiny bit of the germ covering each week, to stimulate production of more whooping cough antibodies until he has enough of them to protect him.

This new material from the germ covering promises to be better than previous whooping cough vaccines because it contains none of the whooping cough poison and because it can be injected into the skin instead of the muscles. As a result, there will be no sore arms and no reactions of sickness with fever.

Science News Letter, January 10, 1942

BACTERIOLOGY

Protection From Six War Ills Developed Since World War I

Vaccines and Toxoids Are Now Available for Tetanus,
Yellow Fever, Gas Gangrene, Typhus and Influenza

MEANS of protecting troops and civilians against six diseases that may come with war have been developed since the last World War, Dr. N. Paul Hudson, of Ohio State University, declared at the meeting of the Society of American Bacteriologists in Baltimore.

Sure protection against yellow fever, which would menace troops fighting in South America or certain parts of Africa, is possible by means of a new vaccine. Tetanus, or lockjaw, and gas gangrene, both serious battle wound infections, can be prevented by toxoids. The anti-tetanus toxoid is now being used. The anti-gas gangrene toxoid has just been reported.

For influenza, typhus fever and measles, the latter a cause of much sick-

ness among recruits in training for World War I, promising vaccines have been developed. Their value may be proved in the present war as the anti-typhoid fever vaccine was proved in the Boer War.

Science News Letter, January 10, 1942

Test for Whooping Cough

ANEW, more reliable test for telling whether children (and grown-ups) are susceptible to whooping cough and a better method for protection against this killing disease of babies was announced by Dr. E. W. Flosdorf, Dr. H. Felton, Dr. A. C. McGuinness, Dr. T. F. Dozois, Dr. A. Bondi and Dr. Stuart

Find Clue to Epilepsy

CHRONIC fits, like epilepsy, have been produced in animals for the first time, Dr. L. M. Kopeloff, Dr. S. E. Barrera and Dr. N. Kopeloff, of the New York State Psychiatric Institute, announced at the meeting of the Society of American Bacteriologists.

Better knowledge of what causes epilepsy in humans will, it is hoped, result from these experiments although the work is too recent to say whether it will lead to means of preventing epilepsy or to better treatment.

The animals, monkeys, rabbits and guinea pigs, developed epileptic-like fits as a result of a little alum applied to the motor area of the brain. Heretofore scientists have been able to produce fits in animals by various means, but only one attack resulted.

In the animals treated by the New York scientists, attacks occurred not just once but continued to occur, for a period of nine months, whenever a loud noise or other stimulus was used to bring on an attack.

Apparently the single alum treatment permanently altered the brain cells so that they reacted abnormally.

The animals could be "cured" by medicines such as dilantin now used successfully in treating epilepsy in humans. Brain waves were typical of those seen in epilepsy.

Unlike the single attacks of fits previously induced in animals, the chronic state of having fits whenever stimulated

did not develop until after an "incubation" period of about four to six weeks after the alum had been put on the brain.

Science News Letter, January 10, 1942

Best Treatment for Wounds

HOW sulfa drugs can overcome one of the worst horrors of World War I casualties, germ infections in wounds, was revealed in reports to the Society of American Bacteriologists.

Sulfanilamide itself is the best of the sulfa drugs for this purpose, in the opinion of Dr. Roy G. Klepser and Dr. J. Ross Veal, of Gallinger Municipal Hospital, Washington, D. C. They reported on their use of sulfanilamide in treating more than 500 infected wounds.

Other sulfa drugs are more effective in test tube experiments, but have no advantage in actual wound treatment and are as much as eight times as expensive, these surgeons pointed out.

After three or four days, sulfanilamide powder checks the healing of wounds, probably because of its drying effect. The Washington doctors therefore advise substituting for the powder, on the third or fourth day of treatment, an ointment containing a lower concentration of sulfanilamide and also containing allantoin. This chemical is the substance from fly maggots which a World War I surgeon, the late Dr. William S. Baer, of Baltimore, found to be good treatment for infected wounds.

Wounds can be about two-thirds sterilized within three or four days, Dr. Klepser said, provided the wound is draining adequately and the sulfanilamide is in

contact with the germs. Dead tissue must be cleaned away or it will interfere with the action of the drug. The sulfanilamide does not kill the germs in the wound directly but starves them out by combining with their food supply.

Sulfanilamide is effective against all kinds of germs which get into wounds and burns, the Washington surgeons find. It must be put directly onto the wound, in order to get a high enough concentration of it. When the drug is given by mouth the dosage is calculated generally to give a concentration in the blood of about eight milligrams per 100 cubic centimeters but by putting the drug directly onto the wound, a concentration 100 times as high can be reached in the fluid in the wound tissues.

Science News Letter, January 10, 1942

Trench Mouth Germs Seen

THE GERMS which are believed to cause trench mouth, so-named because it was a serious ailment of soldiers in World War I trenches, have now been examined under the electron microscope, which uses particles of negative electricity to peer into secret places of matter that cannot be seen with microscopes using light and optical lenses.

Pictures of these and of the syphilis germ and other germs were shown by Dr. Katherine A. Polevitzky, Dr. Thomas F. Anderson and Dr. Harry E. Morton, of the University of Pennsylvania and RCA Manufacturing Company.

Tiny hairs, heretofore seen only with difficulty, were clearly visible at the ends of thin, spiral germs from human mouths.

The syphilis germ was found to be frequently surrounded by a slime sheath which occasionally formed thin tendrils projecting from the organism.

Science News Letter, January 10, 1942

Pasteurized Crab Meat

FRESH crab meat, a delicacy chiefly limited to seaboard regions, may be preserved for as long as five weeks by pasteurization, J. V. Anzulovic and R. J. Reedy, of the U. S. Fish and Wildlife Service, reported.

Color, odor and taste of the crab meat are not impaired by the pasteurization, which reduces the number of bacteria and makes it possible to ship it farther than is otherwise possible because of danger of spoilage.

Science News Letter, January 10, 1942



FOR GIANT BOMBERS

This is the \$47,000,000 plant of the Ford Motor Company under construction near Ypsilanti, Mich. It is to be used to produce the big Consolidated B-24 bombers.

Frozen Soft Shell Crabs

FREEZING storage preserves soft shell crabs, with very little loss in flavor and texture, for as long as 15 months, Harry E. Goresline and Helen F. Smart, of the U. S. Bureau of Agricultural Chemistry and Engineering, announced as a result of studies of freezing as a method of preserving this table delicacy.

Science News Letter, January 10, 1942

SOCIOLOGY

Juvenile Delinquency Can Be Predicted

JUVENILE delinquency can be predicted by use of questionnaires showing up significant points in home and school background of American children, and much misery can thereby be forestalled, H. Ashley Weeks, of the State College of Washington, told the American Sociological Society, meeting in New York.

"Not only does it seem possible to predict delinquency as a whole, but also to predict the type of delinquency that is likely to be committed," he stated.

If children whose backgrounds are likely to lead to juvenile court episodes can be recognized, schools and social workers can better aid them in overcoming handicaps, the sociologist believes.

He told of progress in constructing statistical tables in which significant points of a child's background are scored to indicate probabilities of delinquency. Among 14 factors found useful in prediction, are school advancement or retardation, the family's ownership of a home and length of time they had lived in the county, education of parents, and occupation of the father.

Science News Letter, January 10, 1942

Sugar-coating *steel molds* with dry, pure corn sugar is the latest way of improving the surface of steel.

● RADIO

Saturday, January 17, 1:30 p.m., EST

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

Dr. Arthur Van Dyck, director of the RCA License Laboratories, and new president of the Institute of Radio Engineers, will discuss new advances in radio.

Listen in each Saturday.

Tuesday, January 20, 10:15 p.m., EST

Science Clubs of America programs over WRUL, Boston, on 6.94 and 11.73 megacycles.

One in a series of regular periods over this short wave station to serve science clubs, particularly in high schools, throughout the Americas. Have your science group listen in at this time.

GENERAL SCIENCE

Scientists Pledge Military And Intellectual Victory

Scientists Will Give Service To War Problems Unstintingly Until Peace Is Won and World Reordered

"VICTORY for the military and intellectual forces of America and our allies must be assured if rational living satisfactory to ourselves and the other peoples of the world is to prevail for coming generations."

This war pledge of science, crystallizing the thoughts and feelings of scientists attending the meeting of the American Association for the Advancement of Science in Dallas on the Texas plains, displays the temper with which they enter the war year of 1942.

Formulated by Science Service to penetrate the venter of "science as usual" displayed by a pre-Pearl Harbor formal meeting program, this pledge continues:

"Scientific discovery, research and invention are powerfully at work on war problems. They will give this service unstintingly until peace is won and the world reordered. The nation must have confidence that crucial scientific research and development for war purposes will

aid our fighting forces to supremacy."

Of the first ten officers and ex-officers of the A.A.A.S. and other scientific societies buttonholed in meetings, nine assented heartily and only one preferred not to.

Footnotes to science and war:

Prof. Anton J. Carlson, University of Chicago physiologist: "In war as in peace we must use whatever is left of the function of our frontal lobes. We don't have to start lying. The human race is one species and except for temporary emotion and ignorance it is much the same."

Dr. Morris Meister, principal of the Bronx, N. Y., High School of Science and president of the American Science Teachers Association: "Our science teaching will see many changes due to the war. It is important to continue to give those now entering high school the fundamentals of scientific method and fact because it is they who will have to remake the world after the war."

Science News Letter, January 10, 1942

PSYCHOLOGY—ANTHROPOLOGY

U. S. Advised Not To Copy Nazi Propaganda Methods

USE your scientific knowledge of human behavior to build morale, but don't copy Nazi tactics that pull people's emotions about, invoking rage, fear, revenge, and loyalty, in bewildering confusion.

So the American scientists were urged at the meeting of the American Anthropological Association at Andover, Mass.

Propaganda to sway totalitarian masses is aimed toward short-time, emergency effects, said Dr. Gregory Bateson, who is a member of the Committee for National Morale. In time, this playing upon contradictory attitudes is bad for morale and for the culture of a people.

Scientific skill at first-hand observation of the behavior of living beings in social situations is going to be particularly important in this war, said Dr.

Margaret Mead of the American Museum of Natural History. Anthropologists, she said, are trained to look at whole cultures, not mere segments like housing or crime, and anthropological studies of primitive and civilized mankind have value now in appraising America's new social problems.

American morale can be built, said Dr. Mead, by appealing systematically to "the organized and coherent aspects of American character." Americans, she explained, have a willingness to fight on in face of bad news. It is wise not to soft-pedal bad news for them. American traditions of fair play "make us willing to fight against a stronger enemy but not against an enemy whom we believed."

Science News Letter, January 10, 1942

GENERAL SCIENCE

Amateur Scientists Can Help America

What Your Club Can Do To Serve

By JOSEPH H. KRAUS

Editor Science Clubs of America

Amateurs in this country have made at least 25,000 telescopes. Most of these can be used to bolster National Defense because they can be pressed into the service as important tools for airplane spotters.

Many an air raid warning will be sounded erroneously while the present war is in progress. Failure to differentiate between friend or foe is natural because differences between hostile craft and our own airplanes, although recognizable to a few well-trained observers, will be missed by many spotters. Then, too, the enemy craft may appear at such high altitudes that distinguishing marks cannot be seen.

With a telescope arranged for terrestrial observation, speedy and accurate information can be obtained quickly. An amateur telescope club could arrange among themselves to attend the instrument 24 hours per day. In that way the club would render valuable assistance.

But there is more to this picture than first meets the eye. Amateur telescope makers soon learn how to grind glass not only for mirrors but also for optical flats and prisms.

Optical flats are perfectly flat slabs of glass. Ordinary plate or molded glass is not accurate enough for optical instruments and many measuring devices. Up to the present time the only method for making glass perfectly flat is by hand- or machine-grinding it. After amateurs become adept at doing this sort of thing they can be absorbed by industry for the making of optical parts for range finders, binoculars, scientific measuring instruments and newer experimental developments.

Almost without exception any science clubs' activities can contribute to our National Defense. What has been said of the astronomy and telescope clubs in the previous paragraphs holds with equal force for clubs organized toward other lines of investigation.

The Richmond Chapter of the Beta Beta Beta Biological Fraternity is all-out for defense. This group is now following lines of research leading to a maximum output of food and other farm products.

Obviously, such an activity is important even during peace times but it becomes doubly so during war. In addition, this same group is making every effort to contribute to better health and consequently better morale. Some of its members are interested in "Where to find, and how to prepare edible wild plants."

In many European countries every peasant knows which fungi are edible. Many make use of "strange" seafoods and relish small land creatures for their food value. In America those things are ignored entirely. Enlightening the public to the food which lies underfoot can contribute vitally to our welfare. Even more important is the knowledge that in event of necessity thousands of people could be saved from starvation by having learned of the existence of food values within easy reach.

There are other things which a biological club can do to aid National Defense. The training which the members have had in handling the microscope, in imbedding specimens and cutting them for examination, in clearing and staining the specimens, can relieve trained pathologists in time-consuming details.

Many such clubs could set up blood-typing divisions and issue to everyone who wants it information as to the type



SCIENCE

Serving Science Clubs of Am

of blood he possesses. Then, in event of necessity, it would become a simple matter to give the individual so classified a transfusion of a compatible type of blood.

Biological club members also recognize the value of sepsis. All the members of such clubs can learn first aid procedures; can become members of rescue squads and can make surgical dressings. Their trained eyes will serve them admirably for inspection of walls and bunks, after which they can direct delousing procedures. This is important particularly in shelters where masses of people might congregate.

Many amateur biologists and chemists, working cooperatively, can undertake an investigation of springs and brooks and post those areas where the water is free of contamination and drinkable and those unfit for human consumption.

The responsibility for insuring adequate measures for the protection of the civilian population in our cities rests upon the shoulders of the local authorities. During times of peace the average city is so set up that the authorities can handle any problems in their stride. But war puts a different complexion on matters, particularly if an invasion starts in earnest. Such invasions likely would be presaged with bombs dropped from the sky and fires started in areas about to be invaded.

When this happens it is too late to think about what you can do to best serve your loved ones, your community and your country. This period calls for galvanic action in which every man and woman, every boy and girl, must play his part. The important thing is to know exactly what you are going to do at that time. Meanwhile, everything should be put in ship-shape condition so it can be used in an emergency.

Workshop enthusiasts will find it worthwhile to make small portable boxes of metal or wood, fireproofed, in which insurance papers and valuables may be kept. Making fire extinguishers of all kinds and placing them where they can best be used will add to the safety of the home.

Cleaning out rubbish such as old papers, scraps of wood and particularly underbrush in forests is important. Waste paper should not be destroyed. It can be converted to use again; forest underbrush may be heaped up to rot. It makes an ideal compost heap yielding valuable fertilizer—and makes a swell place to gather insects and other specimens.

Girls in sewing circles can make canvas buckets for fire-fighting and can sew up cement bags while boys fill the bags with sand for use in making shell splinter protections. Similarly, both boys and girls can fireproof curtains, drapes and many articles of clothing while boys can brace tables so that the tops will not collapse even when



OBSERVER



Sponsored by Science Service

heavy weights fall upon them. Thus the kitchen table, without much change or modification, will perform duties as an ideal shelter and protect those who lie under it from any falling slabs of plaster.

Radio club members and other groups can master transmission and reception of messages by wig-wagging flags.

Chemistry enthusiasts who would like to try their hand at research can carry on experimental work in developing an economical method of detinning "tin" cans.

Thus we find that regardless of the nature of your club's activities or your work as an amateur scientist, you can help yourself, your neighbors and your country remain in readiness for a surprise attack from any quarter.

Future articles in this series will include detailed information for the construction of things to do for National and Home Defense.

Science News Letter, January 10, 1942

NEWS OF CLUBS

LONGVIEW, Texas—A well-rounded program has been set up by the Lithium Chapter of the Texas Junior Academy of Science which is at Longview Senior High School. This club will undertake a study of the natural resources of Texas. It holds an open house exhibit each spring, and produces radio programs for the Parent Teachers Association. A system for vocational guidance has been set up by this club, sponsored by Adda Reid Templeton, teacher of chemistry and physics.

KETCHIKAN, Alaska—Members of the Phy Club of Ketchikan High School engage in individual investigations in the various fields of pure and applied science and also group together to produce the larger projects. In addition, the club presents programs to the school assembly and has speakers and discussions on scientific topics. The club is sponsored by Mr. Chapman, science instructor.

ALTOONA, Pa.—A striking example of the valuable contributions science clubs can make to the welfare of their communities and the nation as a whole is shown by the Nature Observation Club at Altoona Senior High School. Under the sponsorship of Harold D. Yoder, biology instructor, members have planted more than a thousand trees. To encourage and practice conservation the members have classified plants and animals found in the vicinity of Altoona and have studied them in their natural habitats. Throughout the winter the group has maintained bird-feeding stations. What these members are doing today will leave its mark probably for many hundreds of years.

CHICAGO, Ill.—The secretary of the Institute Research Laboratory of the Jewish Peoples Institute writes: "Our club will probably be unique in your organization inasmuch as we are all college students and industrial workers. We are joining your body because we believe you have a worthwhile program and we wish to 'get in on it.' Though this club is by no means the first college group affiliated with Science Clubs of America, it does bear the unique distinction of being the first in which members double as college students and industrial workers. The club conducts individual research work upon problems which arise in school and during industrial activities of its members. This is an idea which other science clubs can copy. Manufacturers get great values out of men of this type. The potential power of such a group cannot be judged by its present pay check."

AUSTIN, Texas—During the past fall members of the Raymond L. Dittmar's Scientific Society at Austin High School initiated a tuberculin testing campaign for the school. By the end of January it is expected that 75% of the students will have been tested. This project, which could be duplicated by many science clubs, is a valuable contribution to the health and welfare not only of the students but of the community as a whole. The club holds bi-weekly meetings, encouraging individual projects which later are presented at contests of the Austin Junior Academy of Science. The sponsor is S. W. Hayes.

EUGENE, Oregon—The Science and Outdoor Club at University High School combines study with healthful recreation. Hikes are planned and photographically-inclined members use the occasion to get good pictures which later are produced in an annual publication. The field trips yield materials for experiment by those who incline toward the study of chemistry, physics or biology. The club is sponsored by S. E. Williamson, science instructor.

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INVENTION

Clubs to Join in "Invent for Victory"

Each club affiliated with Science Clubs of America will shortly receive an official government poster that will urge all with scientific and inventive ability to "Invent for Victory."

This poster issued by the National Inventors Council of the Department of Commerce is intended for display on bulletin boards, at club meetings and at public exhibitions.

SCA groups have been selected as recipients of the posters because they will spread the news of the government's need for new ideas and inventions to many others besides their immediate members.

Already the National Inventors Council has received over 35,000 suggestions from the public and all of these have been given careful consideration. A considerable number have been tested by the Army and Navy and some have been adopted. The NIC is the agency through which inventive suggestions to the government can be presented most effectively.

Science News Letter, January 10, 1942

GENERAL SCIENCE

"Things of Science" for 1942 Now Allotted

A sufficient number of THINGS of Science units during 1942 has been allotted to clubs affiliated with Science Clubs of America so that all groups that wish this service are assured that they will be able to receive them.

The January unit consists of a unique collection of transparent materials used in the packaging industry.

This service costs \$4 a year and is issued monthly. The first six months of 1942 can be obtained for \$2.

For clubs that have not received these interesting experimental kits during 1941, a few of the 1941 units are still available. As an introduction, three of them will be sent to groups or individuals for a dollar. Address communications to Science Service, 1719 N St., N. W., Washington, D. C.

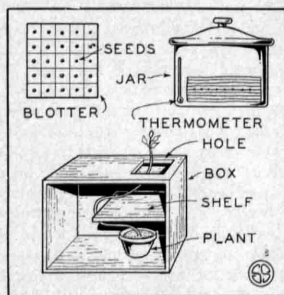
Science News Letter, January 10, 1942

BOTANY

How Good Are Seeds?

An interesting way to determine how well seeds are likely to germinate after they are planted is illustrated at the top of the accompanying diagram.

An ordinary blotter is ruled into squares. A single seed is placed in each of these squares. This blotter is then covered with another of the same size and the combination is then placed between several thicknesses of similar blotters. The entire stack is moistened and now set in a warm place, preferably in a covered jar.



Examine the seeds periodically, being very careful when separating the blotters. You can tell at a glance the percentage of germination.

By introducing a thermometer you can determine the temperature at which the seeds sprout best.

This is a splendid club project. For accurate results and huge coverage it demands hundreds of set-ups—too many for one person.

Phototropism

Make a cardboard box as shown in the lower diagram. Have the front removable. In the bottom of the box put a flower pot in which has been planted the eye of a potato. The growing shoot will take the path illustrated. This tendency of a plant to curve or bend toward light is known as "phototropism."

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SCIENCE CLUBS OF AMERICA

SCA, under Science Service sponsorship, continues the pioneering activities of the American Institute of City of New York over the past 15 years and the Student Science Clubs of America which was merged with that movement. The American Institute continues to foster the regional activities of the junior clubs of the New York City area as a science center.

To effect close cooperation between the American Institute and Science Service, an advisory committee on SCA is being formed.

The principal SCA staff consists of Joseph H. Kraus, SCA editor, and Margaret E. Patterson, SCA membership secretary, based at New York offices at 310 Fifth Avenue, also occupied by the American Institute, H. D. Lufkin in charge.

PUBLIC HEALTH

Health Forecast Difficult

But of the 1941 Conditions Anticipated as Potential Dangers to Health, Only Accidents Were Serious

By DR. LOUIS I. DUBLIN

Third Vice-President and Statistician, Metropolitan Life Insurance Company

IN MY 1940 forecast of health conditions for 1941, I enumerated three principal factors which it appeared might affect adversely the record for the year. They were in evidence this year but, fortunately, favorable developments have more than counterbalanced their effects with the result that 1941 will rank among the best health years on record. In spite of all of the pressures incidental to an extensive war effort, we are maintaining health conditions at their highest levels. While official figures are not yet available for the total population, and will not be for several months, the experience of the Metropolitan Life Insurance Company with its many millions of policyholders covers a large enough cross-section of the population to serve as a reliable index to this conclusion.

In reviewing the factors which I considered as potentially dangerous to the health record of 1941, I note first the effect of the influenza epidemic which appeared on the Pacific Coast late in 1940. While this disease did reach epidemic proportions early in 1941 in all parts of the country, the cases were generally mild and of short duration, the peak was soon passed and the incidence of the disease returned rapidly to normal. However, as a result of this epidemic the mortality from all causes of death in January and February exceeded that of the same months in the previous year. It was only in March that the 1941 mortality began to fall below that of 1940, a position which it has retained throughout the balance of the year.

Young Men Brought Together

Another adverse situation with which the year had to contend was the selective service draft which brought together large numbers of young men who had not established immunity against the more common communicable diseases. There has been little evidence of the ill effects of this so far, however. Only measles, of the four principal communicable diseases, has recorded a rate much above that of last year, and this

rise has been limited to children at the younger ages. A serious outbreak of epidemic cerebrospinal meningitis, which occurred in the last war, and which has been feared in the present situation, has fortunately not materialized.

The third feature which I considered as a potential hazard in 1941 was the accident situation. The stepping-up of production and the absorption of many poorly trained workers in defense industries had already increased industrial accidents by the end of 1940. This situation unfortunately continued throughout 1941. In addition to the sharp rise in industrial accidents, the fatalities from motor vehicle accidents were higher month after month than in the previous year. The increase in motor vehicle accidents is particularly serious this year and will give 1941 one of the worst, if not the worst, record for all time with the number of fatalities in the neighborhood of 40,000. Home accidents declined during the year.

Improved Pneumonia Record

Among the favorable developments of 1941, the most outstanding is the continued improvement in the record for pneumonia. For the first time, deaths from this disease continued to decline in the face of a widespread epidemic of influenza. The drop in rate was approximately 12 per cent for the single year and brings the total improvement to more than 50 per cent since 1937. The effectiveness of the treatment by the sulfa drugs seems now to be assured. What failures have occurred have been due largely to delay in securing medical and nursing aid, and to the fact that complicating diseases very often enter the picture. A recent investigation shows that the noteworthy concentration of pneumonia deaths in infancy is associated with prematurity, congenital defects or weakness, malnutrition, or earlier infections of a serious nature. Likewise at the older ages, pneumonia fatalities are frequently complicated by chronic diseases of the heart, brain or kidneys and by the chronic respiratory conditions, such as bronchitis and asthma.

Another important condition to record

a new minimum rate in 1941 was tuberculosis. This adds to the long series of years which have shown a drop in tuberculosis mortality. The improvement in 1941 over 1940 has been appreciable and gives encouragement to the hope of substantial elimination of the disease by 1960.

It also appears that 1941 may be added to the series of years showing a decline in the mortality from diseases of pregnancy and childbirth. While the death rate for the puerperal causes, per 1,000 population, will remain at approximately the same level as last year, the real test of existing conditions is the number of deaths per 1,000 births, and this has undoubtedly decreased. For preliminary figures indicate that the sharp upward trend in birthrate noted in 1940 has continued during 1941. The statisticians of the Census Bureau predict a birthrate of 18.5 per 1,000 for 1941, as against the 17.9 observed in 1940, and 17.3 in 1939. When we consider the comparatively unfavorable position which the country held in maternal mortality as recently as 1930 it is gratifying to record the low level of maternal deaths at present. For example, in 1940 there were less than 4 maternal deaths per 1,000 births. Ten years ago, when a rate of this order was recorded in the Scandinavian countries, the figure for the United States was nearer 7 per 1,000.

A somewhat unusual feature of the year's experience is the comparatively favorable record made by the chronic conditions characteristic of middle and later life. In the group of cardiovascular-renal diseases, only one—the diseases of the coronary arteries—is up notably. Chronic nephritis reported an appreciable decline in rate this year, while cerebral hemorrhage and the organic heart diseases remained at approximately the same level as a year ago. Even the four per cent increase in deaths from diseases of the coronary arteries is small when compared with the recent average annual increase of about 14 per cent.

Cancer Increase Small

While cancer has continued to show an upward trend in rate this year, the increase is small. At the same time, for the second time in the past decade, diabetes has reported a lower rate than in the previous year.

All in all, the record for the year has



Science Shoulders Arms

What science in the past has done for peacetime America, needs no recounting.

But science today tackles a grimmer job. Research now must give America at war the fighting weapons she needs.

That's why Westinghouse Research Engineers—working in one of the world's leading laboratories—are devoting their full time to the nation's defense requirements. We wish we could tell you about some of the remarkable things they've done already.

We shall—later.

Westinghouse

WESTINGHOUSE ELECTRIC &
MANUFACTURING CO.

Pittsburgh, Pa.

been distinctly good. It suggests no reason why health conditions in the United States should not continue satisfactory in the coming year. It is true, of course, that many of the reservations which I made in my forecast for 1941 still apply. In fact, if last year I spoke with some foreboding of the possibility of our country becoming involved in war, today this is hardly any longer a prospect but an essential actuality, the full effects of which we cannot yet gauge. In the existing circumstances, the dislocation of our civilian population which is now under way, is likely to assume greatly increased dimensions. In the present wholly abnormal state of the world, any health forecast for 1942 insofar as it involves these factors, is necessarily very provisional.

We can feel assured as to the current trend for many of the important causes of death. Most of the acute conditions can now be controlled by medical science and practice. Even for the virus diseases, such as influenza and poliomyelitis, the outlook for ultimate control is improving with the rapid advances in discovering the causes involved and in methods of immunization. There still remain, however, such diseases as acute rheumatic fever, cancer, and the degenerative conditions of the heart and arteries, challenging all the resourcefulness of medical research. We must gird ourselves for the fight against them. Only when this has been won and when real progress has been made in utilizing on a nation-wide scale the new knowledge with regard to nutrition, may we hope for any radical declines to new levels of mortality.

Science News Letter, January 10, 1942

Cockroaches have only one good trait from human standpoint—they kill bedbugs.

Electric "detector" cars discover and mark flaws in rails for railroad track crews to repair.

Books

SCIENCE NEWS LETTER will obtain for you any American book or magazine in print. Send check or money order to cover regular retail price (\$5 if price is unknown, change to be returned) and we will pay postage in the United States. When publications are free send 10c for handling.

Address Book Department
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Washington, D. C.

New Machines And Gadgets

Novel Things for Better Living

Brush your teeth by machinery. That is a possibility opened up by a new rotary toothbrush recently patented. A little motor in the handle provides the rotating, thus relieving the tired business man of that fatiguing motion in the early morning—just when he is most tired.

Artificial flowers that not only look natural but have the fragrance of natural flowers have been patented by—you would never guess—a lady. Each stem hides a little vial of an appropriate perfume. The fragrance can be turned off when no smellers are about, thus conserving the fluid.

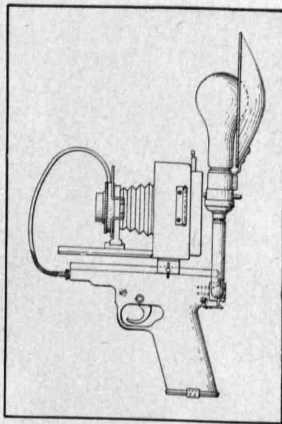
Electric eyes turn on and off additional lights as needed in some of our up-to-date schoolrooms, thus maintaining a constant and even illumination in all parts of the room. The electric eye is here made to do for light what the thermostat does for heat. It maintains a constant intensity of light, while the latter maintains a constant temperature.

Choking your engine these cold mornings will not be necessary if you use an automatic choke recently patented. It combines an electromagnet and a thermostat. The former opens the choke when the throttle is opened. The latter closes the choke when the engine is hot enough to run without it.

Mechanical mothers are provided for orphan calves by an invention that has been recently patented and assigned to a packing house company. Often a considerable time must lapse after the calves have been taken from their mothers and before they can be slaughtered. During this time it has been customary not to feed them at all. A new invention provides a tank for mixing a food from dried milk and a way to convey it to feeding pails.

A sauerkraut cracker which the inventor claims is palatable is made in the following way. Mix 28 ounces of sauerkraut with a little sugar, salt, cream and lard and ten ounces of flour. Roll out into a wafer-like form and bake in the oven. But be careful. The recipe is patented.

The camera man can really shoot his pictures with the equipment shown in the illustration. It is a fully automatic flash light camera, recently patented, with which everything is accomplished by simply pulling a trigger. The shutter is opened and the flash is set off simultaneously. Two lamps are provided, the second lamp directly behind the one shown. One is the flash lamp and the other may be a continuously lighted



flood lamp. A battery is contained in the pistol-like grip, but the device may also be operated by plugging in an outside source of current.

Two entirely different radio programs transmitted on the same carrier frequency, i.e., at the same point on your dial, without interference, is made possible by an English invention recently patented in this country. Stereoscopic television pictures and two-ear sound programs can be produced by this device. It is another astounding development of frequency modulation, the new static-free radio. Two carrier waves of the same frequency are sent out but one is kept just a quarter of a wave length ahead of the other. The receiver is adapted to distinguish between these two waves, so that different programs could be sent on them.

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, D. C., and ask for Gadget Bulletin 36.

Science News Letter, January 10, 1942

BACTERIOLOGY

Research on Germ Poisons Brings \$1000 Award

STUDIES of the chemical nature of the poisons produced by diphtheria and scarlet fever germs won for Dr. Alwin M. Pappenheimer, Jr., of New York University College of Medicine, the \$1,000 Eli Lilly and Company Research Award in Bacteriology and Immunology, given at the meeting of the Society of American Bacteriologists in Baltimore.

Larger quantities of pure material for making toxoid to protect children against diphtheria is one result of the type of studies Dr. Pappenheimer has made.

Science News Letter, January 10, 1942



Radio...all out for Victory

Research and invention have placed radio in the first line of battle

COMMUNICATION—rapid communication—is a vital necessity, on land, at sea and in the air. RCA research and engineering developments in both radio and electronics are strengthening—and will further fortify—the bulwarks of our communications system. At Princeton, New Jersey, the new RCA Laboratories—the foremost center of radio research in the world—are under construction.

★ ★ ★

International circuits, operating on short and long waves, have made the United States the communication center of the world. Today, R.C.A. Communications, Inc., conducts direct radiotelegraph service with 49 countries.

★ ★ ★

Production of radio equipment is essential for news and timely information, for military and naval communications, for dissemination of news among foreign countries. The "arsenal of democracy" has a radio voice unsurpassed in range and efficiency. In the RCA Manufacturing Company's plants, workers have pledged themselves to "beat the promise," in production and delivery dates of radio equipment needed for war and civilian defense.

★ ★ ★

American life and property at sea are being safeguarded by ship-and-shore stations.

The Radiomarine Corporation of America has equipped more than 1500 American vessels with radio apparatus and is completely engaged in an all-out war effort.

★ ★ ★

Radio broadcasting is keeping the American people informed accurately and up-to-the-minute. It is a life-line of communication reaching 55,000,000 radio sets in homes and automobiles. It stands as the very symbol of democracy and is one of the essential freedoms for which America fights. The National Broadcasting Company—a service of RCA—and its associated stations, are fully organized for the coordination of wartime broadcasting.

★ ★ ★

New radio operators and technicians must be trained for wartime posts. RCA Institutes, the pioneer radio school of its kind in the United States, has more than 1,200 students enrolled and studying in its New York and Chicago classrooms.

★ ★ ★

When war came and America took its place on the widespread fighting front, radio was At the Ready . . . with radio men and radio facilities prepared to answer the call to duty "in the most tremendous undertaking of our national history."

David Sarnoff

PRESIDENT



Radio Corporation of America

RADIO CITY, NEW YORK

The Services of RCA: RCA Manufacturing Co., Inc. • RCA Laboratories • R.C.A. Communications, Inc. National Broadcasting Company, Inc. • Radiomarine Corporation of America • RCA Institutes, Inc.

ASTRONOMY

London Needs Daylight Saving; Panama Needs None

United States, Part Way Between, Has Only Moderate Need of Pushing the Clock Forward as War Measure

LONDON far to the north needs daylight saving time badly. Panama, 8 degrees from the equator, with days and nights already nearly equal all through the year does not need it at all. Washington, D. C., needs it only moderately.

America's plans to speed up war production will be aided in coming months by Mother Nature. Following her own plans she is already lengthening the days. In January, the increase in daylight hours will be very noticeable.

In Washington, on January 1, the sun rose about 7:20 and set about 4:40, E.S.T., giving a little over nine hours between. With daylight saving, sunrise would have been at 8:20, sunset at 5:40. At the end of the month there will be an hour more of daylight. As the season advances, the hours of Nature's blackout decrease until on June 22, the longest day, there will be 15 hours between sun-up and sundown and only nine hours of dusk and darkness. With the clearer skies and longer dawn and twilight of that season, there should be enough daylight for two eight-hour shifts, including time to and from work. The sun rises around 4:30 in the morning and sets at about 7:30 in the evening.

If you live farther to the north, the hours of sunlight and also of dawn and twilight, are lengthened in the summer, and diminished in winter. Thus in London, on January 1, the sun rose about 8 o'clock, Greenwich standard time, and set at 3:40. Since London is already on daylight saving time, these hours were

given as 9 and 4:40. Either way, there were only seven and a half hours of sunshine.

In these northern climes (London lies due east of the northern tip of Newfoundland), the dawn and twilight are much longer than for regions farther south. But in the murky atmosphere of London, with its frequent fogs and rains, this is not much help.

On the other hand, by June 22, Londoners will enjoy nearly 17 hours of sunshine—if the sky is clear. And the dawn and twilight are so prolonged that

they overlap. In short, even at midnight the sky is not completely black. Twilight has not yet ended, and the dawn of the succeeding day has already begun.

Honolulu is just within the torrid zone, where days and nights approach equality throughout the year. Here the sun can be seen daily in January for 11 consecutive hours—literally seen, for the sky there is seldom cloudy all over. But in June the day is only two hours longer. Dawn and twilight are very short. An hour after the sun drops almost perpendicularly into the sea, it is already dark.

Manila is still nearer the equator, only 14½ degrees away. The shortest day at Manila is only 15 minutes shorter than at Honolulu, and the longest day only 15 minutes longer.

The Panama Canal, within 8 degrees of the equator, has only one-half hour difference between the longest and the shortest day, 12¼ hours for the one, 11¼ hours for the other. They have daylight saving time all the year around without altering their clocks.

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CHEMISTRY

Soybean Rubber Substitute Sought by U. S. Government

UNCLE SAM'S scientists in the Department of Agriculture are feverishly developing a confidential process whereby they believe soybean meal can be transformed into a substitute for rubber, Science Service has learned.

The process, which for military reasons cannot be described in detail, consists of a series of chemical changes which finally transform the protein molecules of soybean meal into molecules similar in structure to those of rubber.

"Soybean rubber," say chemists of the Department's Bureau of Agricultural chemistry and engineering, "won't come

the day after tomorrow, but it's on the way. It's possible on paper."

Meanwhile soybean oil, extracted by chemistry, already is being substituted for tung oil in paints. Tung oil was imported from China before the war, and diminishing stocks lend special emphasis to soybean substitutes.

Adhesives, plastics, paper finishes, and substitute-wool fibers are other uses for soybeans—uses developed largely by American Government and industrial chemists since 1936 when the Agriculture Department's soybean laboratory was set up at Urbana, Ill.

The production of a synthetic fiber from soybeans has already begun by the Ford Motor Company. The fiber is similar to sheep's wool. It is spun from a molasses-like substance that contains soybean protein. "Pilot" mills at Highland Park, Mich., can spin 1,000 pounds of fiber daily. The Highland Park mills are being moved to Dearborn where they will undertake regular production.

The synthetic product is best when blended with sheep's wool. Early production, say Ford officials, will go into upholstery.

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Not With Guns Alone

STRANGE weapons were used in exterminating America's once vast herds of game and flocks of wildfowl.

Bison and pronghorn were brought to their present low estate not so much with rifles as with plows. Shotguns did not account for the extinction of passenger pigeon and heath-hen, and the dangerous reduction of ducks and prairie-chickens, so much as axes, matches and spades.

True, over-shooting played a heavy part in the reduction of some of the game herds, notably the bison. This was done partly as a military measure during the days of the Plains Indian wars. The Indians lived by following the herds, and wholesale slaughter was resorted to by their white enemies to deprive them of their food supply. The extermination of the bison was in effect a raid on the supply train.

However, extermination was not complete. There were small nuclear herds left, which could have increased and multiplied and repossessed their earth. But land-hungry settlers followed on the heels of the campaigning cavalry. They plowed up the prairie (old-time cavalrymen still call all civilians "sod-busters") and claimed the grasslands which they did not plow as range for their cattle. So there was no room for the bison and for their smaller fellow-wayfarers, the pronghorn antelope.

The same story can be told for the passenger pigeon, which did not stage even the slight comeback that the bison and pronghorn have, but became totally extinct. They were, to be sure, killed in hundreds of thousands with clubs, with shotguns, with small cannon even; but even such methods of massacre would hardly have sufficed to reduce their sundarkening numbers, if the forests east of the Mississippi, which were at once

their roosts, their nesting-places and their larder, had not been cut down to provide lumber and to clear the land for farms. The ax was mightier than the gun.

Fire on Martha's Vineyard wiped out the last remnant of the heath-hen species a few years ago; fire and the plow have destroyed most of the habitat of its kin-bird, the prairie-chicken of the West; the spades and trenching machines of drainage projects have done ducks a like disservice until recent establishment of refuges, which re-flooded some of their old breeding and feeding marshes.

Science News Letter, January 10, 1942

AGRICULTURE

U. S. and Britain Offer To Rescue Russia's Grain

THE United States Government has offered to aid in rescuing from destruction Russia's important grain varieties, to keep them alive for the time when scorched earth can spring up green again.

Responding to a suggestion by Sir John

Russell of the Rothamsted Experimental Station in England, who feels that the need is urgent, the U. S. Department of Agriculture stands ready to receive and plant special Russian grains in United States areas suited to them, or to aid in any other way practicable.

British scientists are expected to salvage Russia's important fruit tree varieties. Very little material is needed and it can be carried by air, Sir John has pointed out. British varieties of fruits would not be at all suitable, he emphasizes.

To lessen hunger and suffering, agricultural reconstruction will be tremendously important in fought over areas, deliberately burned by Russian peasants to prevent enemy use, the British agriculturist foresees. Russian plant breeders have successfully produced many varieties of crops suited to specific regions, particularly drought-resistant varieties. Years of labor by these scientists would be lost if seed for future planting were not saved from the chaos of war.

Science News Letter, January 10, 1942



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79 YEARS AGO, in 1862, Henry A. Ward, Professor of Biology and Geology, University of Rochester, founded this Establishment for the purpose of supplying Museums, Colleges, Universities, High Schools and the Scientific Layman with natural history specimens and materials. His policy and ideals of supplying only the best possible quality at reasonable prices are still the principal aims of Ward's.

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•First Glances at New Books

MATHEMATICS

WHAT IS MATHEMATICS? An Elementary Approach to Ideas and Methods—Richard Courant and Herbert Robbins—*Oxford Univ. Press*, 521 p., \$5. Many important subjects and many famous theorems that do not occur in the usual textbooks, but are scattered throughout the more recondite literature, are here brought together in one volume. While the approach is elementary in the sense that the reader needs no more than a good high school course to start with, he cannot get very far without doing some good hard thinking and learning. But if he is willing to do that, he will find here collected things that he would otherwise have to search in many directions to find.

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GENERAL SCIENCE

FAMOUS INVENTORS FOR BOYS AND GIRLS—Irmengarde Eberle—*Barnes*, 130 p., illus., \$2. Little sketches of fourteen men who have played major roles in remaking the world about us.

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AGRICULTURE—PUBLIC HEALTH

STANDARD METHODS FOR THE EXAMINATION OF DAIRY PRODUCTS (8th ed.)—*American Public Health Association*, 288 p., illus., \$3.

Science News Letter, January 10, 1942

JOURNALISM

HOW TO READ A NEWSPAPER—Edgar Dale—*Scott, Foresman*, 178 p., \$1.40. Good description and discussion of the modern newspaper as an editorial production, a business and a public service. Unfortunately, the growth and importance of science in newspapers is hardly mentioned.

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HISTORY

THE DEFENSES OF SPANISH FLORIDA, 1565 to 1763—Verne E. Chatelain—*Carnegie Institution of Washington*, 192 p., 22 maps, \$2.25 paper, \$2.75 cloth. See *S.N.L.* Sept. 27, 1941.

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GENERAL SCIENCE

THE DILEMMA OF SCIENCE—William M. Agar—*Sheed & Ward*, 140 p., \$2. Science from the standpoint of the Catholic church interpreted by a Catholic scientist, professor of geology at Columbia. "Science cannot deal with right or wrong or with values of any kind." "Materialism has become the corner-

stone of a dangerous political philosophy and idealism has come to the fore in advanced scientific speculation." "We conclude that science is not self-sufficient, that it cannot answer every question concerning man and the universe. Materialism leads to misery and oppression."

Science News Letter, January 10, 1942

GEOPHYSICS

TRANSACTIONS OF THE AMERICAN GEOPHYSICAL UNION, 1941, Part III, Reports and Papers, Section of Hydrology—*National Research Council*, 448 p., \$3.

Science News Letter, January 10, 1942

TECHNOLOGY

A. S. T. M. STANDARDS ON PETROLEUM PRODUCTS AND LUBRICANTS—*American Society for Testing Materials*, 398 p., \$2. This is the 16th annual issue of this work which gives all the test methods, specifications, definitions and charts developed by the A.S.T.M. The present volume gives the latest approved form of these tests, etc., and adds new standards and tests of aviation gasoline and a method of determining ignition quality of Diesel fuels.

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ORNITHOLOGY

THE BIRDS OF NORTH AND MIDDLE AMERICA, Part IX—Robert Ridgway and Herbert Friedmann—*Govt. Print. Off.*, 254 p., illus., 40c. (U. S. Natl. Museum, Bull. 50). Includes the following families: Gruidae, Rallidae, Heliornithidae and Eurypygidae.

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ETHNOLOGY

INDIANS, YESTERDAY AND TODAY—Willard W. Beatty, ed.—*U. S. Office of Indian Affairs, Education Division*, 74 p., illus., 15c. For school teachers and others who may want information about the origin of the Indians, their cultural gifts to America, and their present problems of health, farming, and adjustment to modern living. The chapters are illustrated with a number of good photographs and drawings.

Science News Letter, January 10, 1942

METALLURGY

THE SPECTROCHEMICAL ANALYSIS OF METALS AND ALLOYS—F. Twyman—*Chemical Pub. Co.*, 355 p., illus., \$8.50. This is a useful work for teachers and students, for those who are already engaged in spectrochemical work or for those who wish to introduce this kind of analysis.

Science News Letter, January 10, 1942

AERONAUTICS

AIR BASE—Boone T. Guyton—*Whitelsey House*—295 p., \$2.50. Everything that a boy will find if he completes his training at Pensacola and reports to an air base is told in this book. The training of dive bombers, the how and why of the cruises, life in the squadrons, in the officers' quarters and aboard an aircraft carrier during war games, is described from the author's personal experience.

Science News Letter, January 10, 1942

MEDICINE

THE COMPLETE WEIGHT REDUCER—C. J. Gerling—*Harvest House*, 246 p., \$3. This unusual book might well be called an encyclopedia of weight reducing. It does not present any special system of diet or exercise. Subjects are presented in alphabetical order, from "Abdomen, reducing girth of" to "Zigzag system", which the author, quite rightly, denounces roundly. Other useless or harmful weight-reducing systems, devices, preparations and medicines are similarly debunked and denounced. On the other hand, there is much sound and constructive advice to be found under such headings as clothing, makeup, menus for reducing, and the like.

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ETHNOLOGY

SMOKE FROM THEIR FIRES, The Life of A Kwakiutl Chief—Clellan S. Ford—*Yale Univ. Press*, 248 p., \$3. In this unusual book, a 70-year-old Indian of Vancouver speaks through the aid of a Yale University anthropologist, recollecting and telling incidents of a full life, just as he might tell them to you. Dr. Ford has preserved the Indian personality and psychology faithfully, even to the quaint forms of the old chief's informal speech.

Science News Letter, January 10, 1942

BOTANY

PLANT HUNTERS IN THE ANDES—T. Harper Goodspeed—*Farrar and Rinehart*, 429 p., illus., \$5. A botanist tells of his South American travels in search of new plant species to bring back home and breed. There is such a wealth of description of people and places, however, that the book will fascinate those who know nothing of botany but just like books of travel. Excellent photographic illustrations, lavishly distributed through the pages, heighten the effect of the story.

Science News Letter, January 10, 1942