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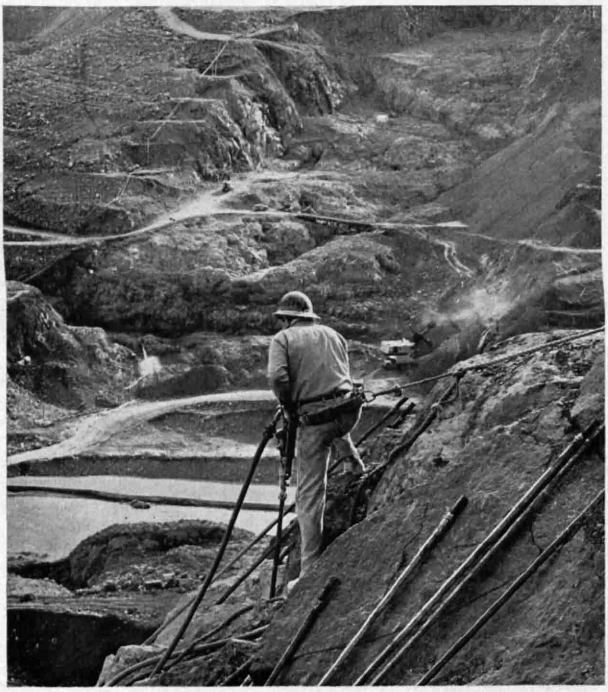
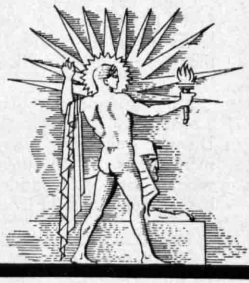
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •





October 5, 1940

By a Dam Site

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A SCIENCE SERVICE PUBLICATION

Do You Know?

Alfalfa roots sometimes go 40 feet deep.

Manufacturers find that a little glycerine keeps oil in *peanut butter* from separating.

In tests at the University of California, *infra-red* lights failed to protect citrus trees from frost.

The United States had about 360,000 miles of *surfaced highways* in 1920, and now has 1,172,000 miles.

By tattooing *bullsnakes,* biologists are learning the snakes' migrating habits, the better to keep them from stealing duck eggs.

Scarcely 10% of automotive equipment is adaptable to manufacture of *military* products, says the Automobile Manufacturers Association.

In an *ice storm* last March, New York City trees were so ice-laden that twigs one-eighth inch in diameter measured altogether an inch and a half.

China has "beggar" *silkworms* that feed on withered or waste mulberry leaves unfit for well-fed worms, and these beggars produce silk of a low grade.

A life insurance statistician figures that according to *life tables* the six-year-old Dionne quintuplets may expect 41 more years as an unbroken group, whereas each girl considered separately has an even chance of living to be 69.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

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STATISTICS

How many states are barometers of the election? p. 218.

WILDLIFE

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What wild animals are soil experts? p. 216.

CCC boys are to build an airplane *landing stage* for the Army at Metlakatla, Alaska.

The headpiece was the most difficult part of a suit of *armor* to make, says an expert on medieval armor.

A steel *tugboat* launched into the Tennessee Valley lake system is equipped with two 8-cylinder Diesel engines.

Fever treatment is found helpful in curing *turkeys* of a usually fatal parasitic disease in the digestive tract and liver.

Most of the world's *vanilla* comes from Madagascar and other French islands.

England had more than 70 *steam busses* in commercial use from 1825 to 1840, old records indicate.

Taming the American wild *crab-apple* is being attempted, in the hope that this fruit's good points may find more uses.

Greater safety for patrons of modern motion picture theaters is provided by a new *"magic carpet"* which glows under ultraviolet lamps.

SCIENCE NEWS LETTER

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MEDICINE

Succeed in Trials of Serum For Horse Sleeping Sickness

Hope That Remedies for Infantile Paralysis and Other Virus Diseases of Central Nervous System May Develop

HOPE that specific remedies to treat sleeping sickness, infantile paralysis, and other virus diseases of the central nervous system can be developed appears in the new rabbit serum for treating the western strain of horse sleeping sickness announced by Dr. Joseph Zichis and Dr. Howard J. Shaughnessy, of the Illinois Department of Public Health. (*Journal, American Medical Association,* Sept. 28.)

Men as well as horses are attacked by the form of sleeping sickness known technically as equine encephalomyelitis. Vaccines to protect horses from the disease have been used successfully, and at least one such vaccine suitable for protecting humans has been developed.

A successful serum for treating the disease would be more practical than the vaccine for humans, public health authorities point out, because so little is known about the spread of the disease that it is hard to determine where and whom it will strike and who should be vaccinated. Vaccination of the entire population, of course, would be impractical, especially as human cases have not been very numerous.

The serum developed by the Illinois health department scientists from the blood of hyperimmune rabbits has given good results in treatment of mice and guinea pigs. Practically all the animals treated in the early stages and about two-thirds of those treated in the later stages of the sickness recovered. No human trials are reported, though further studies of the serum are said to be in progress.

Serums for the treatment of other virus caused diseases have been developed and used before this. In the case of diseases like the horse sleeping sickness, encephalitis, and infantile paralysis, however, no success with serum treatment has been achieved. Scientists have thought this was because in these diseases the virus strikes nerve cells and the serum could not be got into contact with the virus in these cells. Examination of the brains of the treated animals that recovered showed that the virus had been spreading in and damaging the brain but that its progress was checked by the serum. This gives hope that serums can be developed to check the damaging progress of other viruses that invade the brain and nervous system, though, of course, it may be some time before such serums are ready for use if they ever are.

Reason for the success in serum treatment of laboratory animals suffering with equine encephalomyelitis was, the Illinois scientists believe, the fact that a big enough dose was used. Contributing to the success also may be the use of rabbit serum instead of horse serum. The rabbit serum is believed to have smaller antibody (disease-fighting) molecules which probably can penetrate to the infected body tissues more rapidly.

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PSYCHOLOGY

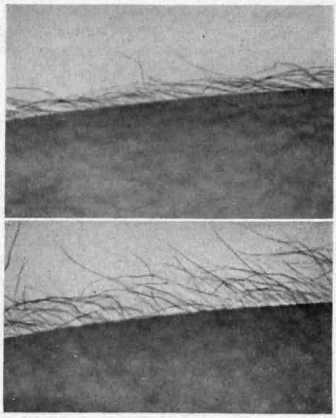
Studies Man Who Can Make His Own Hair Stand on End

PERHAPS you can wiggle your ears, but can you voluntarily make your hair stand on end?

Dr. Donald B. Lindsley, of Bradley Home and Brown University, showed before the meeting of the American Psychological Association a motion picture film of a man who can raise the hair on his arms whenever he wants to. More than that, he can step from a hot shower into a cold draft and yet keep the gooseflesh from coming up on his skin.

He doesn't scare himself to bring on the hair-raising. He doesn't even picture in his mind a painful or terrifying experience. He just raises the hair, so far as he knows, in much the same way that he works his muscles. He found he could do it when he was a ten-year-old boy.

Dr. Lindsley, studying the man while making the motion pictures, found that a lot goes on during this hair-raising experience of which the man was not aware. The pupils of his eyes dilate as though he were scared. His heart speeds up. Breathing is faster. Even his brain waves are changed. These are the physiological changes that usually accompany the erection of hairs during fright.



HAIR RAISING

These frames from a motion picture show how one man can make his own hair stand on end. The view above is before he was signaled to raise it; below, after.

Psychologists can only speculate as to how the hair-raising is done. It has already been found that by "conditioning" you can learn to contract the pupils of your eyes when you are told to. This is done by shouting the command "constrict" at the same time that a bright light is flashed into the eye. The pupil automatically closes to the light, but after a while it will close at the command alone.

Dr. Lindsley makes the suggestion that possibly this man during his childhood may have been "conditioned" by some similar tie-up between the hair-raising and voluntary behavior. No evidence is available to prove or disprove such a theory.

Two things are evident from the case, however. No matter how he starts his sympathetic nervous system to working, it nevertheless works, as is customary, as a unit. The man can't raise his hair without changing heart rate, breathing, and so on.

Of more importance to psychologists are the observed changes in the electric potentials over a single area of the brain, the pre-motor area. This seems to be evidence of some connection between the sympathetic nervous system and the brain cortex.

Science News Letter, October 5, 1940

ARCHAEOLOGY

Rosetta Stone Among Treasures Evading Europe's Bombs

With Abandonment of Plan to Protect Museums By Flag, World's Most Precious Relics Have Gone in Hiding

THE ROSETTA STONE, the portrait head of Egypt's lovely Queen Nefertiti—admired by Adolf Hitler—and other world-famed archaeological relics are among the fugitives from bombs falling on London and Berlin.

Talk of protecting museums by a special flag in wartime, which seemed fair enough when discussed between the last war and this, became too fantastic to mention when the present war shaped up. So, back to underground or country hide-outs and sandbag covers went such irreplaceable treasures as the Elgin Marbles from the Parthenon and the Portland Vase, called the most famous vase in the world.

Outstanding fragments of ruins and art objects from dead civilizations, which the two fighting capitals are protecting as best they can, have been through strenuous experiences before.

British Museum treasures include one of the seven wonders of the ancient world, the Mausoleum at Halicarnassus, or what is left of it. Built to the memory of Persian Prince Mausolus, at the seaport of Halicarnassus in Asia Minor, this lofty and resplendent tomb went through one of Alexander the Great's sieges, when he warred with Persia. Surviving this in pretty good shape, the ancient sight-seers' "wonder" fell into ruin in the Middle Ages, and crusaders broke and burnt much of the marble for building stone and lime. Less than a century ago, British excavators found and put together large fragments of the sculptures, including a statute of Mausolus himself, nearly ten feet high, and the wonder which has given the name mausoleum to monumental tombs came to London.

Found During a War

The Rosetta Stone, another British Museum treasure, came to light in the midst of a war, when Napoleon's soldiers, trench-digging, brought up a broken-edged stone with writing on it. Recognized as a valuable relic, the Rosetta Stone was ordered boxed and Napoleon intended to ship it to France. But fortunes of war gave the stone, along with victory, to Lord Nelson and England. The damaged stone, inscribed with the same text in Greek, in sacred Egyptian hieroglyphics, and in everyday Egyptian script, ultimately enabled scholars to decipher the hieroglyphic writings of old Egypt.

The fragile Portland Vase, still another British Museum highlight, met its most violent misadventure, not through war, but when an insane man widly smashed it to bits. An exquisite piece of glass workmanship, this vase was brought to light from a Roman tomb in the sixteenth century. The Duke of Portland in 1786 paid $5,000 for the ancient masterpiece and placed it in the museum for the world to enjoy. The vase is made in cameo technique. A deep blue glass layer is overlaid by a white layer into which scenes are cut. The vase survived its blitzkrieg attack, and pieced together by experts, it is as lovely as ever.

Damaged By Shell

The Elgin Marbles, fragments of the Parthenon frieze, are another of the British Museum's choicest possessions which have been through violent experiences. An exploding shell in the Turkish-Venetian conflict in 1687 wrecked the famous Parthenon in Athens. In 1801, Lord Elgin managed to bring away to England portions of the damaged, but still wonderful, frieze of the temple. The frieze contains many figures made by the master sculptor Phidias, and has been praised as the most perfect sculpture the world has known.

Outstanding among Berlin's archaeological treasures is the huge Altar of Zeus from Pergamum, which portrays scenes of war, and which has been through wars of a sort on its own account. The huge altar, unearthed by German archaeologists in Asia Minor, is particularly notable for its sculptured frieze more than 150 yards long, on which a mighty conflict between gods and giants is shown. It was a different sort of conflict—the zeal of early Christians to destroy heathen shrines—which probably wrecked the monument, long ago. Berlin built a special Pergamum Museum to hold the remains of this altar and other relics of the site.

A war of words has been the gentler sort waged over another Berlin treasure, the portrait head of Queen Nefertiti. So beautiful is the sculptured, painted head that it has given Nefertiti the reputation of being Egypt's loveliest queen. Within recent years diplomatic conflict has raged as Egypt tried to bargain for return of this very important object. German archaeologists had carried Nefertiti home along with other objects they unearthed at Tel el-Amarna. Belatedly, Egypt insisted that the art significance of this portrait is too great for it to be lost to the home country. In 1934, Hitler squelched negotiations for exchange of two fine statues for the Nefertiti head. Hitler liked the beautiful queen, and refused to permit her to return home.

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PSYCHOLOGY—PHYSIOLOGY

Bombarded Civilians Urged To Protect Their Hearing

AMIDST shrieking sirens and the bursting of bombs, the quiet pages of England's leading scientific journal urge English civilians to protect their ears. Deafness like the loss of hearing of airplane pilots who fly without ear protection is likely to result from the high-explosive sounds of warfare which

CHINESE?

Who made these curious Alaskan carvings of brown fossil ivory? Not Eskimos, says Dr. Froelich Rainey, the discoverer. Possibly from north China came the ancestral culture of the unknown carvers.

STRANGE SIGHT

"You'll see a man with ivory eyes if you roam late at night!" Eskimo mothers warn their children. When this man with ivory eyes came to light, in recent digging north of the Arctic Circle, Eskimos gasped, and so did the archaeologists. The skeleton may be 2,000 or 3,000 years old.

now are a part of the daily life of London.

Simple methods of protection against damage to hearing are described by Dr. T. S. Littler, of the University of Manchester (*Nature*, Aug. 17). Dr. Littler has studied the effect of the noises of warfare on the human ear.

It is not so much the intensity of the noise that produces damage to hearing, he found, as the speed with which the pressure of a high-explosive bomb reaches its maximum intensity. The smaller the gun, the sharper and more distressing the sound, Dr. Littler found. Hearing for the higher pitches is lost, including the highest notes of flute and violin. It affects the clarity rather than the loudness of speech.

The "horrific noises" which Germany has made a part of their aerial warfare, do not, however, do any damage to the ear. These noise-makers produce a prolonged but less intense sound. Their effect is only psychological.

Simple, home-made protective devices will prevent deafness from bombardment, just as the aviator's helmet has been found ample protection against the deafness from airplane noise. Absorbent cotton ear plugs soaked in vaseline can be carried about and used when necessary. Children should be protected by pads strapped over their ears. A rubber wedge to be held between the teeth is recommended to prevent the full shock of an explosion from being carried through the bones of the skull.

Relaxation of the face muscles during the blast is urged by Dr. Littler. Londoners may find that a little difficult these days.

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ARCHAEOLOGY

Unearth the Oldest Town In Arctic Circle Alaska

Man With Ivory Eyes and Art Work of Unknown People Are Among the Surprises to Eskimo and Archaeologist

THE SURPRISING discovery of a large Arctic town with well-planned streets, inhabited by a mysterious people centuries ago—possibly even before the time of Christ—is reported by Dr. Froelich G. Rainey of the University of Alaska, leader of an expedition for the American Museum of Natural History.

Mapping a town of 625 houses arranged in five east-west avenues, Dr. Rainey was so impressed to find such a large and well-ordered place by the barren Arctic Ocean that he could compare it only to ruins in Crete and Greece. The town has been discovered in a great gravel spit of Point Hope, Alaska, about 100 miles north of the Arctic Circle.

Search for the ancient inhabitants of Ipiutak, modern Eskimo name for the neighborhood, was first rewarded when an Eskimo named Moses stumbled into a shallow pit near the village ruins and found himself among scattered human bones and implements.

Failing to strike more graves by test digging, the archaeologist recruited an entire Eskimo village to the hunt, with reward of $3 for finding a grave. In a howling gale and rain, forty men, women, and children turned out and after a long day struck seven graves. Later, burial discoveries totaled 65.

Gasps from Eskimos greeted the first revelation of a human skull with two large and staring artificial eyes with black pupils. Several more men with ivory eyes later came to light, one also outfitted with ivory nose plugs shaped like birds' heads. This skeleton also had an ivory cup-like object over its teeth, while another had two long bands of ivory beside the hips, with complex and mysterious engravings unlike any Dr. Rainey had ever seen.

Objects recovered from the tombs include tiny ivory needles, flint objects, arrowheads, ornate chain links, carvings resembling monsters, and curious twisted ivories which the Eskimos dubbed "biscuits."

That these unknown people reveal the earliest culture yet found along the Arctic coast is the view of Dr. Rainey, expressed in his report to Dr. Clark Wissler, anthropology curator at the American Museum.

From studying revelations of the site, and especially the strange ivory carvings, Dr. Rainey strongly believes that he has brought to light remains of a race that was not Eskimo and that must trace back to a complex and advanced culture unknown—unless, he adds, it was from the ancient civilization of north China.

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PSYCHOLOGY

Strict Schedule for Baby May Make Hostile Adult

THE mother who puts her young baby on a strict feeding schedule may be building up a personality that will resent cooperation in later life.

This seems to be the implication of a report by Dr. J. McV. Hunt, of Brown University, to the American Psychological Association.

In a laboratory experiment with rats, Dr. Hunt found scientific confirmation for the Freudian doctrine that experiences in very early infancy have a profound effect on the character of adult men and women.

Dr. Hunt put baby rats on a "schedule." For two weeks he gave them only a limited amount of food instead of feeding them all they wanted. When they were grown, the rats turned into misers, hoarding great quantities of food if they felt even slight pangs of hunger. Rats who were "put on a schedule" early in infancy were affected more in later life

than those whose dieting was begun later.

In human terms, this might mean that babies brought up strictly on schedule, regardless of how hungry they may sometimes be, are likely to be peculiarly sensitive to any deprivation or neglect in later life.

This fits in with observation of anthropologists who have found that in primitive people, late weaning and indulgence are characteristic of friendly, cooperative tribes. The Prussians who bring up their babies with Spartan strictness, are also known to be more aggressive and less cooperative than are people where custom permits indulgence and long nursing of the babies.

Psychologists are particularly interested in how the forgotten experiences of infancy are able to influence adult character. Dr. Hunt explains that when the baby is hungry, he becomes emotionally upset. This sets up a connection between hunger and emotion so that in later life even mild degrees of hunger or lack of attention may bring on a similar upset.

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MEDICINE

Cancer-Causing Substance Found in Human Cancer

EXTRACTION of a cancer-causing substance, apparently for the first time, from primary human cancer is announced by Dr. John F. Menke, Finney-Howell fellow in cancer research at Stanford University Medical School and Hospital. (*Science,* Sept. 27.)

Dr. Menke's experiments, if confirmed, may help answer the question of whether cancer-causing chemicals of the hydrocarbon group, such as can be made in the laboratory, are made in the human body. This is one theory of cancer cause along which chemists are working.

The cancer-causing substance Dr. Menke obtained from human breast cancers has not yet been identified chemically. When injected into mice of a strain which rarely develop cancers spontaneously, tumors developed at the very site of the first injection. So far, only two of nine mice injected have developed cancers.

Significant is the fact that the cancers developed in these animals after only a few injections of small amounts of the material.

Mice develop cancer following injection of a wide variety of substances, but only after repeated injections of large amounts of material. Exception to this is the case of the laboratory-made cancer-causing hydrocarbons. Cancer develops in mice after only one injection of a small amount of these chemicals. The fact that it did not take many injections of the human breast cancer extract to cause the cancers in the two mice suggests that something in the extract, rather than the irritation of repeated injections of a foreign substance, was responsible for the development of the cancer.

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CHEMISTRY

Nobelist Predicts Discovery Of More Chemical Elements

DISCOVERY of radioactive chemical elements now unknown was predicted by Prof. Enrico Fermi, Nobelist of Columbia University, in telling the University of Pennsylvania Bicentennial Conference how the atomic particles called neutrons disintegrate heavy elements like uranium.

His experiments were in part performed upon the uranium isotope 235 from which physicists in many countries are known to be attempting to obtain atomic power in practical quantities.

Uranium splits into two chains of radioactive elements, each containing three to four elements. Dr. Fermi and his associates measured the amounts of all known chemical elements produced and they added up to only about half of the quantity of uranium destroyed. He concluded as a result that there were still to be discovered and analyzed more radioactive elements, possibly rare earths.

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PSYCHOLOGY

Studies Behavior on Way Toward Nervous Collapse

A WAY to pick out the person who is approaching nervous breakdown and prevent that catastrophe may in future be found as the result of new research in the psychology laboratories of Brown University.

Building on what has recently been discovered about the causes of nervous breakdown, and the comparisons in both rats and humans between "neurotic" and "normal" individuals, Dr. Frank W. Finger has gone back of the mental crisis. In experiments with rats, he has watched and measured the abnormalities of behavior that are preliminary to nervous disorder. He found out how a rat behaves when he has not collapsed, but is on the way toward nervous breakdown.

The rats in Dr. Finger's experiment are faced with a difficult problem of choice between two similar gray cards. If he jumps against one, it swings open to food. The other will not swing, and he gets a bump on the nose and falls.

After each punished jump, Dr. Finger found, the rat will hesitate longer in making his choice, and will jump with greater force.

This tendency increases when the difficulty increases and following each punishment. For a whole day following each trial, the rat is sluggish.

By measuring the time of hesitation and the force of the animal's jump, Dr. Finger was able to obtain, probably for the first time, a quantitative evaluation of what happens on the road to nervous breakdown.

If a similar measure can be found for changes in behavior of men and women faced with increasingly perplexing or unsolvable problems of life and continually punished by life's hard blows, it may be possible to help those who are approaching the breaking point.

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Whistling arrows in China were launched to frighten people off the streets when a Manchu emperor rode by.

Baby walruses recently shipped from Alaska to a Chicago zoo were fed en route on milk, clam juice, and codliver oil.

MEDICINE

"Fifth Column" Chemicals Suggested for War on Disease

Germs Fooled Into Eating "Trojan Horse" Chemicals; Successful Use on Cancer Remote But Perhaps Possible

FOOLING germs into eating "Trojan Horse" chemical compounds resembling their food, but actually non-nourishing, is part of the latest tactics in man's war on disease suggested to the University of Pennsylvania Bicentennial Conference by Dr. John S. Lockwood of the University of Pennsylvania's department of surgical research.

This "fifth column" method of attack may work on disease germs and even, perhaps, on cancer. First, it would be tried on germs. Successful use on cancer seems more remote than against other diseases.

The sensational success of sulfanilamide chemicals against many diseases suggested the new method of attack. Dr. Lockwood and others discovered that apparently sulfanilamide cures by starving the germs to death.

A chemical structurally similar to sulfanilamide and needed by germs for their nutrition has been identified as p-amino benzoic acid. This chemical has been found capable of checking the germ stopping action of sulfanilamide.

The theory is that the two compete for the same single position of attachment to the bacterial cell. If this theory proves correct, Dr. Lockwood suggests that chemists should be able to make other compounds sufficiently similar to compounds needed by bacteria to fool the latter into taking them instead of the ones they need.

For applying the fifth-column strategy to cancer, Dr. Lockwood pointed out that cancer is "a disease in which unrestrained proliferation of tissue cells is similar in some respects to the proliferation of bacteria in invasive infections.

"If the difference between malignant cells and normal cells should be found to be due to the local activity of some chemical growth factor, a compound of similar chemical configuration might be administered to cancer patients which would block the activity of the proliferative factor without exhibiting its physiological effects."

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MEDICINE

Large Mobile Hospital Shipped by Navy to Cuba

THE U. S. NAVY is shipping to Cuba next month a new 500-bed mobile hospital that will be rushed to any outpost in the western Hemisphere where American fighting forces may need hospital care.

Any 500-bed hospital complete with operating room, X-ray, dental, laboratory and other equipment, such as this one, is a sizable institution. Only in large cities do you find many hospitals that big. Packed in crates ready for its maiden voyage, this hospital measures 112,000 cubic feet. It occupies all the space on a 500-foot pier in the North River, New York. In the Brooklyn Navy Yard a freighter is being overhauled to transport the hospital.

With all its size and completeness of equipment, mobility is the essential feature of this new hospital, its commanding officer, Capt. Lucius W. Johnson stated.

Practice in getting the hospital ashore, unpacking it, setting it up completely with every sponge and sheet in place and the instrument sterilizers in the operating room going, tearing it down, packing it and loading it on board ship will occupy the officers and men of the unit for the first months after its arrival at the U. S. Naval Station at Guantanamo, Cuba.

By January first, Capt. Johnson said, he hopes to know just how swiftly this can be done. Then the Navy Department will know how fast the hospital can move to outposts in South, Central and North America when need for it arises.

Thirty medical officers—surgeons, psychiatrists, dentists and other specialists—and 300 enlisted men of the Navy will staff the hospital. These will include hospital corps men, machinists, carpenters, painters, a civil engineer, and, Capt. Johnson hopes, a supply officer to handle payroll and purchases. These officers and men will be commissioned and organized on Oct. 5 and will sail a few days later.

The new hospital is part of the medical side of national defense which calls for "good, healthy men" in the fighting forces, Capt. Johnson said, and for every possible means of keeping them well.

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ASTRONOMY

Discover Six New "Fluorescent" Stars

SIX additions to the list of a rare type of star, in which, by a process comparable with that taking place in the fluorescent electric lamps now becoming so popular, the stellar atmosphere absorbs ultraviolet light from within, and rebroadcasts it as visible red light, have been made at the Cook Observatory of the University of Pennsylvania (*Astrophysical Journal,* Sept.).

The discovery was made by Dr. Orren Mohler, now a member of the staff of the McMath-Hulbert Observatory of the University of Michigan.

Technically, these are known as "Be" stars. Their spectra, obtained by analyzing their light through a spectroscope, show the typical dark lines, but in addition certain lines, particularly those indicative of hydrogen, are bright. Less than one star in two hundred, on the average, shows this effect.

These stars are very puzzling. Taken at face value, the bright hydrogen lines would indicate that part of the atmosphere of the star, though exposed to the extremely low temperatures of outer space, is hotter than the interior. This is so improbable that astronomers think the "fluorescence" process takes place. According to this hypothesis, hydrogen atoms take in energy from invisible ultraviolet light radiated from inside the star. As they then give up this energy, a considerable amount of hydrogen light—mostly red—is produced which causes the bright lines in the spectrum.

Science News Letter, October 5, 1940

PHYTOPATHOLOGY

Plants Acquire Immunity In Same Way Animals Do

PLANTS do acquire immunity to disease, and in much the same way as animals do, is the conclusion reached by Dr. James M. Wallace, of the U. S. Department of Agriculture, with headquarters at Riverside, Calif.

Testing the destructive sugar-beet curly-top disease on tobacco, Dr. Wallace found that severely affected plants recovered, or at least showed very few evidences of the malady. At the same time, he discovered that there seemed to be developed by the plant an unnamed something which caused the disease to be held in check.

The disease was still in the plants, Dr. Wallace explained, for healthy tobacco plants could be infected from the recovered ones.

Dr. Wallace grafted heathly scions on diseased stocks, and diseased scions on healthy stocks, and found that the healthy portion became diseased, but mildly, depending on the length of time the disease-masking "something" had had to develop.

"In short," says Dr. Wallace, "the phenomena are comparable to those known in animal diseases in cases of active immunization and the production of passive immunization by protective substances or antibodies. On the basis of the evidence obtained in these experiments, the behavior of the recovered plants is interpreted as acquired immunity and that this acquired condition results from protective substances produced by a specific relation between the tobacco plants and the curly-top virus."

Science News Letter, October 5, 1940

MEDICINE

Bone-Cutting Operation Relieves Soft Corns

A BONE-CUTTING operation for relief of soft corns has been devised by Dr. H. B. Macey, of the Mayo Clinic.

Report of the operation may be good news to men facing a winter of marching and drilling in Army training camps, but the operation is most likely to be advised for patients with diabetes or blood vessel disease. The soft corn may be only a painful annoyance to most persons but it may be dangerous to the person with diabetes or blood vessel disease, Dr. Macey points out, particularly because of the tendency to infection.

The anatomy of the fourth and fifth toes make ideal conditions for the development of pressure on a bony prominence which leads to callus formation, Dr. Macey explains. Soft corns, situated between the toes and generally between the fourth and fifth toes, are calluses. Their softness arises from their confinement between the toes and the associated moisture of the feet.

One of the bones of the fourth toe often ends with a bony prominence or bump pointing toward the fifth toe. The opposite bone of this toe may also have a prominence. The wearing of short, narrow-toed, forward-pitching shoes may cause one if not both of these bony prominences to press on the flesh between, with a callus resulting.

To relieve the condition, Dr. Macey says the prominent portion of the bone of either toe may be removed by operation. The prominence must be removed smoothly and cleanly so that no sharp points are left to cause further trouble.

Science News Letter, October 5, 1940

WILDLIFE

Blasting Improves Living For Waterfowl In Marshes

WHEN peace comes back to Europe, and men use guns not on each other but to get themselves a few wild ducks for the pot, they will profit by the chance bombs that miss their military targets and fall in marshy areas. For it has been found that a marsh can be greatly improved as a home for water-loving wildlife species by blasting openings in the thickly matted vegetation, making small ponds where ducks and geese can swim.

Experiments in the creation of such small water areas in a bulrush-cattail marsh near Jewell, Iowa, are reported (*Journal of Wildlife Management,* October) by Thomas G. Scott of the U. S. Biological Survey and W. L. Dever of E. I. du Pont de Nemours and Company.

They found the most economical method to be to thrust sticks of dynamite into the wet soil to depths of from two and one-half to four and one-half feet, fairly close together in rows. The last stick was set off with the usual type of detonating cap, whereupon the concussion set off all the rest. The explosion opened a ditch from nine to twelve feet wide and three or four feet deep. In a short time the vegetation around the margin adjusted itself, and the new home was all ready for the ducks to move in.

Science News Letter, October 5, 1940

IN SCIEN

WILDLIFE

Woodchucks Soil Experts Connecticut Survey Shows

WOODCHUCKS know their soils. They can tell the difference between two soil types that only a trained soil expert can detect, it appears from observations reported by Prof. A. E. Moss of the University of Connecticut (*Journal of Wildlife Management,* October).

Recently, states Prof. Moss, there was occasion to make a detailed soil survey of a certain tract on the University's grounds. A highly trained expert made borings, and plotted the various soil types on a detailed map.

Scattered over the area were many woodchuck burrows, apparently at random.

These were also spotted in on the map. When Prof. Moss came to examine their distribution, he found they were almost all in the loose-textured soil type known as sandy loam. Areas of the nearly similar type known as fine sandy loam, intermixed with the sandy loam itself, were avoided by the soil-wise woodchucks.

Science News Letter, October 5, 1940

PHYSIOLOGY

Blood Pressure Linked With Width of Chest

BROAD-CHESTED persons have a hereditary predisposition to high blood pressure and narrow-chested persons are born with a predisposition to low blood pressure, according to figures collected by Dr. S. C. Robinson and Marshall Brucer of Chicago and reported in summary by the *Journal of the American Medical Association.* (Sept. 28.)

"The difference in susceptibility to hypertension (high blood pressure) in persons of contrasting body build extremes was unusual," comments the editor of the *A.M.A. Journal.*

Only 4% of the narrow-chested men had systolic pressures over 140 mm., whereas 22% of the broad-chested men belonged definitely in the high blood pressure class.

Science News Letter, October 5, 1940

E FIELDS

ENGINEERING

California's Shasta Dam Will Be Second Largest

See Front Cover

SECOND in size only to the Grand Coulee Dam on the Columbia River, the Shasta Dam of the Central Valley Project in California will hold back water on the Sacramento River over an area of 30,000 acres. It will be used for flood control, for power, and also to repel the salt water which now backs into the river from San Francisco Bay.

Work on the dam site is shown on the cover picture of this week's SCIENCE NEWS LETTER. Excavations for the foundations have been completed, and pouring of concrete begun. A total of 5,600,000 cubic yards of concrete will be used. The dam will be 560 feet high, and 3500 feet long at its crest. The top will be 37 feet thick and the base 580 feet.

Science News Letter, October 5, 1940

MEDICINE

Doctors to Wear Badges If Helping With Defense

YOUR doctor may be wearing a badge showing he is on defense service next time you see him.

The American Medical Association's committee on medical preparedness, it is announced, has been authorized to issue badges and special certificates to be used by all physicians who are contributing services to the government whether in or out of government military service.

Announcement of the badges came at the end of a conference of the committee with Col. Charles B. Spruit, medical adviser to the Joint Army and Navy Selective Service Board; Dr. Thomas Parran, surgeon general, U. S. Public Health Service; Col. Albert G. Love, representing the U. S. Army Medical Corps and Capt. Dallas G. Sutton, representing the U. S. Navy; and state chairmen for medical mobilization.

How to keep enough of the nation's 179,000 physicians at home to look after the sick people in the civilian population and at the same time provide enough to help the Army, Navy and other military services, including draft boards, medical advisory boards and induction boards, is one of the big problems the conference tackled. No recommendations were announced, however.

Dr. Irvin Abell, Louisville, Ky., chairman of the committee on medical preparedness, is the civilian representative on the medical coordinating committee appointed by President Roosevelt to cooperate with the Council of National Defense on problems of public health. Dr. Abell was unable to attend the conference because of illness, but is reported recuperating. Dr. Lewis H. Weed, chairman of the division of medical sciences of the National Research Council, and the surgeon generals of the U. S. Army, Navy and Public Health Service are the other members of the medical coordinating committee.

Science News Letter, October 5, 1940

PSYCHOLOGY—EDUCATION

More Democratic Now Than in Colonial Days

AMERICA has its own distinct educational ideals, more democratic than any brought over with the colonists from Europe, Dr. Newton Edwards, professor of education at the University of Chicago, told the Bicentennial Conference of the University of Pennsylvania.

Our schools and colleges, he said, are symbols of American democracy. They stand for our faith that we can solve our own problems without resorting to dictatorship.

Americans want all their children to have a chance at good education. So far, this has not worked out, but it is held firmly as an ideal.

Americans want every American boy to have a chance to advance and make a good place for himself in the world. They want no boy or girl held firmly in some lowly place.

Americans believe that the very life of democracy is at stake in the education of future voters. Ability to judge public issues must not be confined to leaders. All the people must understand the workings of democracy if democracy is to work.

Education is looked upon by Americans as the guardian of all that we treasure most—our enduring values. Americans are not willing to hand over to some political dictator the determination of what we should consider good and desirable.

Most cherished of America's educational ideals is that of freedom of thought and the search for knowledge.

Science News Letter, October 5, 1940

PHYSICS

Confirmation of Relativity In Eclipse Observations

A NEW confirmation of Einstein's relativity theory is provided by a Japanese astronomer's communication in *Nature*. T. Matukuma, of the Astronomical Institute of Tohoku Imperial University at Sendai, reports on his observations of the total solar eclipse seen in Japan on June 19, 1936.

The observations were made from Kosimizu, in the northern island of Yezo, and were mainly intended to check the bending of star light as it passes close to the sun. Because stars near the sun cannot ordinarily be seen, it is necessary to make photographs at the time of an eclipse, then to check these photographs of the same part of the sky, made when the sun is out of the way.

Mr. Matukuma reports that one plate made at the eclipse was compared with two others taken six months later from Sendai. The values obtained were 2.13 seconds and 1.28 seconds, which refer to the angle that a ray of sunlight is bent inwards from a straight line as it grazes the sun. The average of these two is 1.70 seconds, very close to the value of 1.75 seconds, predicted by Einstein when he published his theory in 1915.

Previous confirmations of the shift were made by an English expedition in Brazil in 1919, which obtained 1.98 seconds, and a party from the Lick Observatory to Australia in 1922, which made it 1.78 seconds. Thus, the Japanese determination is in good agreement with both the theory and the earlier observations.

Science News Letter, October 5, 1940

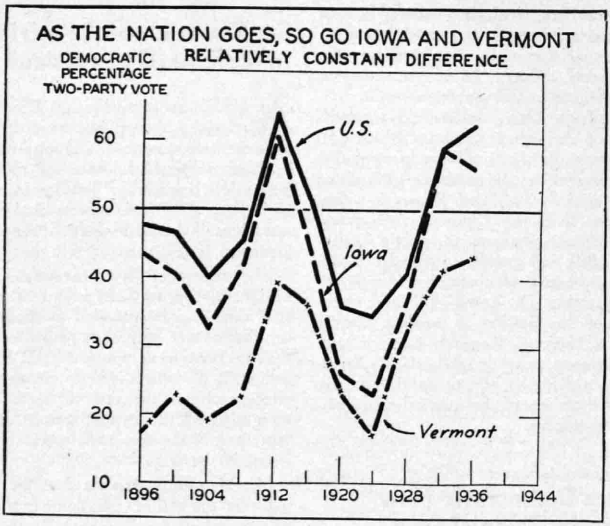
PSYCHOLOGY

You Remember Things You Have Never Learned

LESSONS studied but apparently never learned may still become part of your storehouse of knowledge and even be recalled later, Dr. John A. McGeoch, of the University of Iowa, has found.

How anyone can remember something he could not learn in the first place is still a puzzle to psychologists, but it has been experimentally demonstrated by Dr. McGeoch as actually taking place. The explanation may be, he suggested, that mental brakes which originally prevented learning are later released so that the process in time is completed without further study.

Science News Letter, October 5, 1940



BAROMETERS

Whoever is elected next November to the Presidency, there are at least 30 states whose pattern of voting corresponds with that of the nation, in addition to Maine. The above chart, prepared by Dr. Bean, shows how Iowa and Vermont follow the national trend.

STATISTICS

Maine Not the Only Barometer Of the National Election

Iowa, Vermont, and In Fact Any of Thirty Uncertain States Would Be as Good an Index of Coming Election

By EMILY C. DAVIS

THE famous election year saying, "As Maine goes, so goes the nation," might just as well be "As Iowa goes," or "As Vermont goes."

In fact, leaving out the perennially Democratic-voting South, almost any variable state is a good election barometer.

If you can appraise accurately, today, how any one of about 30 uncertain states will vote for President in November, you can predict with fair accuracy whether the country as a whole will vote a Republican or a Democrat into the White House.

So declares Dr. Louis H. Bean, one of the Department of Agriculture's experts on farm and market statistics, who has turned to analyzing presidential election figures as a spare-time hobby.

Dr. Bean has now discovered that there is a recognizable pattern of ballot behavior, which American voters follow as the nation swings every four years between Republican and Democratic support. He has just finished a small blue-bound book, *Ballot Behavior* (American Council on Public Affairs). It is, he says, a pioneer effort to bring statistical order out of the seeming chaos of our voting history.

Hastening to Dr. Bean's office, we put the inevitable question:

"Who will be elected, then, Dr. Bean: Willkie or Roosevelt?"

The statistician smiled. It turns out that he is not going to take all the excitement and suspense out of the big day in November. He has worked out "an aid to judgment."

"If you are told," he explains, "that the country is 54 per cent. Democratic at a given moment, and you have in mind the pattern that American voting has followed up to that point, then you have a good deal of solid ground on which to base a forecast.

"Whether the next vote will show the people becoming more Democratic or more Republican is the big question. From the springboard of known fact, figured to the latest given point, you can venture to project the facts a step toward the future."

You Can Judge for Yourself

Hence, when you listen to predictions of weather-wise, ear-to-the-ground politicians, or pore wonderingly over sample polls of public sentiment, keep in mind the facts up to date—the normal voting pattern—and you can better judge those predictions.

Here is how Dr. Bean went to work to chart this voting pattern of this country:

Taking the presidential vote of the past 40 years, he reduced it to simplest terms. That meant setting down the state-by-state vote for Republican and Democratic candidates at each election.

Then he drew a curve to show rises and drops of the Democratic vote through 40 years. By similar curves, he showed the 40-year record of Maine's presidential voting, and the record of other uncertain states. And, strikingly, each state, like the nation, followed in general the same ups and downs. Some states fluctuate more than others. But the pattern is unmistakable.

"With the normal pattern in mind," explains Dr. Bean, "you have a basis for recognizing the abnormal, and you can better judge how the abnormal will alter the result."

Abnormal—or unusual—factors that affect the normal voting pattern this year are chiefly the third-term issue and the foreign situation. In 1928, it was the religious issue of a Catholic presidential candidate, coupled with a prohibition factor, which skewed the pattern, causing some states to vote much more Democratic than experts forecast and some much less.

It is the abnormal factors which make forecasting political weather so hazardous, Dr. Bean emphasizes. There is no voting history, for instance, to show how the American public weighs a third term.

In addition to the record of presidential elections, which indicate the shifting tide of public opinion, Dr. Bean's new book also presents the first statistical measure of political tides in terms of

party makeup in Congress from 1854 to 1938—an 84-year record.

In electing Congressmen, voters swing more markedly between Democratic and Republican voting than they do when they choose an Executive. For instance, in 1936, Democrats hit an all-time record of dominance, for their party in Congress, with 79 per cent. of House membership. The presidential vote of that year was 62 per cent. for Roosevelt. There have been four major swings of the pendulum since 1854.

The last strong indication of how America's voting pendulum is swinging occurred in 1938. To test the voting pattern, which he was then evolving, Dr. Bean tried predicting a congressional election in the sixth Iowa district. Knowing how the political pendulum had swung to that point, he wanted to see whether he could project one step into the future. He forecast that the vote would be 39 to 40 per cent. Democratic. It proved to be 39.4 per cent. This indicated that Iowa's sixth district was still in step with the nation as a whole, and there were no abnormal local factors pulling it away from the national voting pattern.

Democratic Early in Year

Had a congressional election been held early in 1940, Dr. Bean suspects that Democrats would have had as much as 57 or 58 per cent. of the two-party membership in the House, judging by the direction of the pendulum's swing. And this would ordinarily correspond to a Democratic vote for President of 54 to 55 per cent. There you have a projection of the political tide up to June, 1940, before the war and choice of candidates for the Presidency began to tug hard at voters' sentiments.

Either party could win this November with a hair's breadth majority over 50 per cent., providing the party could corral that slim majority in every state. Since election of a President is based on electoral votes of the states, rather than popular vote, distribution of the popular vote is important. This year, Democrats apparently require more than 52 per cent. of the popular vote to win enough votes for victory whereas Republicans could win with as little as 48 or 49 per cent.

According to a Gallup poll announced August 25, the sampling of voters gave Democrats 51 per cent., Republicans 49 per cent. The sampling method, as statisticians see it, is useful to show trends. As Dr. Gallup has pointed out, it is not precise. A voting sample that gives 49 per cent. for one party may mean statistically a range from 45 to 54 per cent., which is a wide range for basing certain prediction.

Dr. Bean, who puts in a long office day with farm and market statistics, began his busman's holiday of studying political statistics at night because he got to wondering. What he was wondering about was that "As Maine goes—" tradition. Also, it seemed strange to him that a democracy should take less pains to record voting curves than crop reports.

Research in public opinion is expanding fast, he observes. There is need for making political data as conveniently available as economic data are.

In his statistical essay, he puts it in these words:

"The record of behavior of the voting citizens at the moments when they exercise the greatest privilege in a democratic society has been treated with less importance than market data. It is, in fact, easier to find in official documents the price of hogs at some shipping point in Nebraska or Missouri than to locate in official sources the presidential or congressional election statistics in those or other communities."

Science News Letter, October 5, 1940

PUBLIC HEALTH

Major Problems Face Nation Rapidly Rearming for Defense

AMERICA rapidly rearming for total defense still faces three major problems. These are:

1. Bringing to a high point of physical fitness all the men, not just two-thirds of them, who will be called for Army training and service this year and in the years to come.

2. Protecting men in training camps and nearby civilians from meningitis, influenza, pneumonia, syphilis, and other diseases that threaten the health of a newly-drafted Army and its civilian neighbors.

3. Recruiting, training, equipping and assigning doctors, dentists, nurses, sanitary engineers and other health and medical personnel to care for the armed forces, the workers in defense industries and the civilian population.

It is expected that the Army, the Navy, the Public Health Service and the medical and allied professions, side by side, will tackle these vital defense problems. Disagreements over methods of giving preventive and curative medical care to the nation will, in the present exigency, be compromised.

In anticipation of the nation's call to its medical and health scientists to solve these three major problems and many only slightly lesser ones, the medical sciences division of the National Research Council, working closely with the Surgeons General of the Army, Navy, and Public Health Service, has already drafted some 150 of the nation's leading authorities on medicine and public health. For months these men have quietly been working on the problems to be faced and the best methods of solving them.

When their recommendations are given the force of law, things will get done that were difficult or impossible to accomplish before—such things as discovering and bringing to treatment most of the cases of active syphilis in the country, the rehabilitation of all the young men in the nation now suffering from correctable physical defects and ailments, and providing hospital beds for treatment and isolation of thousands of tuberculosis patients now going untreated and spreading the disease to others.

At the same time that America is preparing her defenses against outside foes, she is preparing to wipe out such enemies that bore from within as syphilis, tuberculosis, malaria, and malnutrition.

Science News Letter, October 5, 1940

RESOURCES

U. S. Sent Japan Over Half Its Imports of War Materials

Embargo on Scrap Cuts Japan Off From Its Mainstay Source of One of "Big Four" Basic War Materials

WITH the United States cutting off exports of scrap iron and steel—vital war material—Japan is squeezed into a tight spot where it can hardly hope to find another market "just as good."

The Nippon war machine has been in a precarious position on war imports since July 2, when the National Defense Act of the United States authorized the President to place at any time a complete export ban on war goods. A United States ban on aviation gasoline exports overseas was issued July 26.

The embargo on scrap, effective October 16, cuts Japan off from its mainstay source of one of its "big four" war imports. These are scrap, oil, copper, and machine tools. In 1939, the United States furnished 91% of all the scrap iron and steel that Japan got from other countries, indicating to observers that Japan finds it increasingly hard to shop elsewhere for this material. Yet scrap is essential not only to munitions but also to heavy industry. In 1939, Japan imported nearly $36,000,000 worth of scrap. getting $32,592,000 of it from the United States.

To round up the remaining 9% of the imported scrap, Japan had to deal with 11 scattered markets, according to a new report compiled in the United States by the Chinese Council for Economic Research. These sources of small to fair-sized amounts included Australia, the second-best supplier, Sweden, Hong Kong, British India, Canada.

A "moral embargo," effective since June 11, 1938, has been credited with reducing airplane sales to Japan. However, the United States has continued to supply more than half of all Japan's imported war goods.

If the United States should prohibit exportation of two items—machine tools and scrap—a heavy blow would be struck against Japan's whole war economy. So, predicted Dr. T. Y. Hu, author of the Chinese Council for Economic Research's progress report, issued in September, on Japan's dependence on other nations for war supplies. The United States supplies 70% of Japan's imported machine tools.

The United States, concerned over the bottle-neck of producing machine tools speedily for defense work, increased its exports of these machine tools to Japan in the first six months of this year.

Over $15,500,000 worth of these precision implements were shipped to Japan in the first half of 1940, representing nearly a million-dollar increase over the similar period in 1939.

Europe's war narrows down foreign sources of supply on which Japan can draw for war purposes, his report shows. European countries sent less assistance to Japan in 1939 than the previous year, though they still figured as an important source of heavy manufactures. The war, however, threatens Japan with virtually complete stoppage of such strategic supplies from Europe as aircraft, automotive equipment, machine tools and certain metals. Japan's major program for developing Manchukuo has been hampered by inability of Germany to send needed machine tools there.

Altogether, Japan has been dependent on at least 28 foreign countries or colonies to send her supplies for war, figures of three years show. Seven of these countries, headed by the United States, accounted for over 90% of the total value of such shipments in 1939. Figured by Dr. Hu, the shares of the leading seven exporters of war goods to Japan last year were: United States, 55.7%; British Malaya, 8.7%; Canada, 8.5%; Netherlands Indies, 8.3%; Germany, 4.3%; British India, 3.3%; Italy 1.3%.

Science News Letter, October 5, 1940

MILITARY SCIENCE

Use of Britain's Naval Bases May Affect Design of Ships

USE by the American Navy of all of Britain's world-wide net of bases may have a radical effect on the design of future warships built for this country's service. This effect would be most noticeable in types intended for wide-ranging duties, especially cruisers, destroyers and submarines.

Hitherto the U. S. Navy, with very few bases outside the continental United States and most of them close to our own shores at that, has favored large ships of great "built-in" cruising radius, carrying big supplies of oil and provisions.

Britain's navy, on the other hand, with plenty of strategically disposed bases and supply depots, can get along on considerably smaller fuel and food supplies. This is one of the reasons for the British preference for smaller cruisers, of 6,000 to 7,500 tons, as contrasted to the American insistence on a 10,000-ton displacement for even the "light" (six-inch gun) cruiser type.

If this country is given the facilities of British naval bases throughout the world, the hitherto prevailing necessity for great cruising radius and correspondingly large supply space may be considerably modified. It is possible that our sea strategists and naval architects will become contented with ships of smaller displacement and less cruising range, with proportionately more of their tonnage devoted to guns, armor and internal protection against torpedo and bomb attack. That is, there may come to be substantial agreement between the United States and Britain regarding the most desirable type of cruiser.

Science News Letter, October 5, 1940

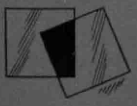
● RADIO

John A. C. Warner, secretary and general manager of the Society of Automotive Engineers, will preface the automobile show by discussing "Automobiles of the Future," as guest scientist on "Adventures in Science" with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Thursday, Oct. 10, 3:45 p.m. EST, 2:45 CST, 1:45 MST, 12:45 PST.

Listen in on your local station. Listen in each Thursday.

How is your intellectual *Curiosity*?

What will Members get in the first three monthly units of THINGS?



OPTICS UNIT

Two areas of valuable optical film will go to members. With them you can perform experiments that will be easy for you but which have baffled the world's finest minds for more than 250 years. We will describe *four* of these experiments which you can perform without buying any additional equipment. Then we'll explain *how* these films work.

FINGERPRINT UNIT

Fingerprinting is in the news these days. One thinks of impressing an ink-smudged finger on paper—a messy business. Members will receive an *inkless fingerprinting outfit* with material good for many impressions. There will be a purse fingerprint card that may sometime be useful to you in cashing a check, and an official complete fingerprint record document which may be registered with the Government or kept in your safety deposit box. We'll tell you *how to classify* the arches, loops, whorls and composites in yours or any fingerprints.

FABRICS UNIT

Members will receive a piece of *cloth spun from glass;* a tuft of fiber *made from milk* which feels like wool; a silk-like cloth made from *salt, coal, lime and air;* a sheet of paper that feels like cloth; and other new fabrics which are products of scientific experiment.

Coming- THINGS units on Taste, Plastics, Meteorites, Heredity, Odors, Archaeology, to name a few of the units on which the Staff of Science Service is now working.

Message to Schools

The description of each unit of THINGS will be on bristol board, with a museum-style legend for use in a laboratory display cabinet if desired. The legend card will also contain on its lower portion, a clear, brief explanation of the contents of the unit.

FOR YEARS, we of the staff of Science Service, the non-profit institution for the dissemination of scientific knowledge, have been asked questions like these:

How can I get a sample of *this* new substance? or
What does *that* new product feel like? or
My son asked me about this discovery, and I want to make it more real to him—can you send me a *demonstration unit?*

In the past we had no way to meet these requests, but there have been so many of them that we have *now worked out a way.*

A new science group is being organized to receive THINGS of science. The membership of this group is by necessity limited during 1940 to 1,000 and restricted to the United States. To each member of this new group we will each month dispatch *a unit of scientific material,* unusual, intriguing, surprising. With each unit we will supply a brief, clear explanation of its contents.

Since this is a non-profit organization, THINGS will not attempt to make money, so the membership charge has been set at $2. Every member will get the full measure of interest and curiosity-satisfying knowledge from his monthly unit of THINGS.

The membership period will reach from November, 1940 through May, 1941, and will entitle each member to *seven* monthly units of THINGS.

You are invited to become a member. We recommend that you send us the following application form *immediately* because when a total of 1,000 friends of science have joined, the roster will have to be closed.

MAIL THIS APPLICATION

To: *Things*

2101 Constitution Avenue, Washington, D. C.

I hereby apply for membership in your new science group, and enclose $2 for the seven units which are to be dispatched to me monthly, postage prepaid, from November 1940 through May 1941.

Signature _____

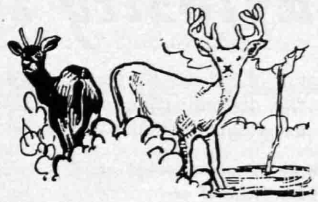
Mailing Address _____

City & State _____ B

CONSERVATION

NATURE RAMBLINGS

by Frank Thone



Unity Called For

CONSERVATION in America requires a single viewpoint and a unified program, to put the support of all the people behind an understanding of all the problems and the rescue of all our resources, Prof. Paul B. Sears of Oberlin College stated, in an address before the University of Pennsylvania Bicentennial Conference.

In the past, Prof. Sears pointed out, separate groups have attacked small sectors of the conservation problem. Fishermen have tried to save and restore fish. Hunters have tried to save and restore game birds and animals. Foresters have tried to save the woods and plant new trees. And so on. However, each of these groups in turn has found itself forced to pass the narrow limits it set for itself: fisheries problems were found to step over into the fields of stream pollution and soil erosion; forests and wildlife were found to be inseparable. And over them all has impended the great weight of national and world changes.

To meet the problem as a whole one must see it whole, Prof. Sears continued. He pointed out three ways in which a human community and its natural environment may be thrown out of balance: changing requirements of the community itself, depletion or disturbance wrought by its culture, and "natural" changes not caused by man.

Outstanding in the first class are changing habits of our civilization in food, housing, etc. Demands for more milk and vegetables, less heavy starches and meats, will cause shifts in place and type of farming, even in replacement of plowland by pasture. Rapid increase in the housing program can cause heavy drains on the surviving forests.

Highly developed civilizations, in all ages and lands, have tended to deplete resources, sometimes to the impoverishment or even the extinction of the culture itself. Thus, the ruinous floods of China, the desert and semi-desert condition of many Mediterranean lands, seem to be at least in part traceable to bad land management in the past, just as the dust storms of recent years in this country followed unwise plowing-up of grasslands in the West.

Gradual climatic changes have apparently played some part in the rise and fall of civilizations, though this is usually difficult to trace. As an example, Prof. Sears cited evidence that the Mound-Builder culture moved into the upper Mississippi and Ohio valleys from the Southwest, along with an epoch of warmer, drier climate some centuries ago. Then, with the return of a cooler, moister climate the forest returned, and the Mound Builders were replaced by the Eastern, forest-dwelling tribes of Indians.

Science News Letter, October 5, 1940

ARCHAEOLOGY

Archaeologist Reverses Job; Buries Relics of Today

AN archaeologist has now had the reverse job of burying relics of our civilization for wondering scientists to dig out about A.D. 6939. As Dr. Clark Wissler of the American Museum of Natural History turned a crank attached to a caldron, the Time Capsule at the World's Fair, containing a choice collection of current news and literature in microfilm form, plus 40 or more everyday objects and other symbols of our time, was sealed with 500 pounds of pitch and chemicals.

Emphasizing that it is no joke to suppose that English may be a dead language when the Time Capsule sees daylight again, Dr. Wissler pointed out that mighty Egypt's hieroglyphic writing was unreadable when scholars first probed Egyptian ruins.

"That such a fate to knowledge is still possible is obvious from what is going on today," emphasized Dr. Wissler, approving the inclusion in the capsule of a key intended to reveal the English language without a parallel inscription in a living language.

Calling the everyday objects—such as a can opener, woman's hat, toothbrush, electric lamp—deposited in the capsule "man's baggage," the archaeologist pointed out that man is unique in his trait of carrying baggage with him everywhere he goes, and that the archaeologist's slogan is "by their baggage each age and condition of men is known."

Recently, he weighed the baggage carried by a moderately well-to-do Australian native, and learned that the man carried about 14 pounds, the woman about half that much. Surprised at this proportion, since women are traditional property carriers among savages, he later realized that the woman would also probably have a child as a burden.

A great deal of thought was given to selection of materials placed in the capsule, he said, to convey the best idea of present day civilization in small space.

The torpedo-shaped capsule, designed by Westinghouse engineers, was buried in a 50-foot "Immortal Well."

To complete the protective devices, the capsule was sealed by pouring a substance 58% pitch, 17% chlorinated diphenyl, and 25% mineral oil down the shaft of the well. The compound, intended to last for thousands of years, was chosen because it is resistant to electrolysis and has other special qualities.

Science News Letter, October 5, 1940

•First Glances at New Books

EXPLORATION

MY VANISHED AFRICA—Peter W. Rainier—*Yale Univ. Press,* 307 p., $2.75. Highly readable is this Kiplingesque, rapid-fire narrative of a man's life and adventures in Africa. Mr. Rainier tells of diamond hunting, gold, Zulus, Boers, tin mines, and then, most completely, of the fighting in the World War against Germans in Southwest Africa.

Science News Letter, October 5, 1940

TECHNOLOGY—BIBLIOGRAPHY

WHERE TO FIND THE NEW TRADE NAMES—Alice M. Amoss—*Pub. by author, Edgewood Arsenal, Md.,* 31 p., 75c.

Science News Letter, October 5, 1940

PSYCHOLOGY

PSYCHOTHERAPY—Lewellys F. Barker—*Appleton-Century,* 218 p., $2. Intended for the physician in general practice and the intelligent layman, is this informative volume by an emeritus professor of medicine at the John Hopkins University.

Science News Letter, October 5, 1940

MINERALOGY—TECHNOLOGY

SILVER IN INDUSTRY—Lawrence Addicks, ed.—*Reinhold,* 636 p., $10. A full discussion of all phases of the use of silver in industry. The discussion begins with descriptions of the properties of silver and its alloys, outlines methods of plating and other applications, tells of photographic, bactericidal and other chemical uses, and finally describes uses of silver in the arts. An especially valuable feature is the bibliography—119 pages in six-point type.

Science News Letter, October 5, 1940

POLITICAL SCIENCE

BALLOT BEHAVIOR, A Study of Presidential Elections—Louis H. Bean—*Amer. Council on Public Affairs,* 102 p., cloth, $1.50; paper, $1. See page 218.

Science News Letter, October 5, 1940

AERONAUTICS

AMERICAN AVIATION DIRECTORY, Aviation Officials and Companies, U. S. and Canada (Vol. 1, No. 1)—Wayne W. Parrish, ed.; David Shawe, ass't. ed.—*American Aviation Assoc.,* 234 p., $5 subscription (two editions); $3 single copy. Including manufacturers of aircraft, parts, and equipment; air lines; organizations and schools, as well as government departments, this directory will surely prove of great value to anyone concerned with aviation. By issuing two editions per year, the publishers will be able to keep it up to date, in a rapidly developing field.

Science News Letter, October 5, 1940

SCIENTIFIC LITERATURE

NOTES ON THE PREPARATION OF PAPERS FOR PUBLICATION IN THE JOURNAL OF HYGIENE AND PARASITOLOGY—G. H. F. Nuttall—*Cambridge* (Macmillan), 62 p., $1.15.

Science News Letter, October 5, 1940

GEOGRAPHY

COLLEGE GEOGRAPHY (2d. ed.)—Earl C. Case and Daniel R. Bergsmark—*Wiley,* 767 p., illus., $4. A comprehensive text, covering regional and economic factors in man's occupation of the earth. This new edition has improvements in arrangement and emphasis, and the authors stress the contrast between slow changes in natural resources and human nature and present rapid changes in human adjustment to environment.

Science News Letter, October 5, 1940

GEOGRAPHY—ARCHAEOLOGY

FROM EGYPT TO THE GOLDEN HORN—George Sergeant—*Revell,* 254 p., $3. A book about Bible lands, blending history, geography, archaeology, and modern sight-seeing, all in one. For student use, Bible references to chapter and verse dot every paragraph. The result is a reference guide, with sufficient literary flavor to hold attention in general reading.

Science News Letter, October 5, 1940

NUTRITION

FOOD, NUTRITION AND HEALTH (5th ed.)—E. V. McCollum and J. Ernestine Becker—*McCollum and Becker,* 217 p., $1.50. Much new knowledge has been gained in the field of nutrition since the last edition of this book appeared four years ago. The new and completely rewritten edition therefore will be much appreciated by laymen who want authoritative, up-to-date and easily understood information on the subject.

Science News Letter, October 5, 1940

SPORT

BOWLING—Joe Falcaro and Murray Goodman—*Barnes,* 72 p., illus., $1.

Science News Letter, October 5, 1940

SPORT

FENCING—Joseph Vince—*Barnes,* 62 p., $1.

Science News Letter, October 5, 1940

EVOLUTION

EMBRYOS AND ANCESTORS—G. R. De Beer—*Oxford Univ. Press,* 108 p., $2.50. The author presents a theory of evolution, in its connection with embryology, which is intended to take the place of the older idea of recapitulation, which he rejects. This new book is a restatement and amplification of his thesis, first presented in 1930 under the title *Embryology and Evolution.*

Science News Letter, October 5, 1940

PHOTOGRAPHY

LOOK AT LIFE!—Lynwood M. Chace—*Knopf,* illus., $3.50. The nature photographs of Lynwood Chace are by now familiar to readers of many American magazines, as well as to people who conduct their field trips only via the Sunday rotogravure section. Here, he has collected some scores of his best posed pictures of subjects ranging from squirrels to spiders.

Science News Letter, October 5, 1940

AGRICULTURE

REPORT ON THE AGRICULTURAL EXPERIMENT STATIONS, 1939—Office of Experiment Stations—*Govt. Print. Off.,* 265 p., 25c.

Science News Letter, October 5, 1940