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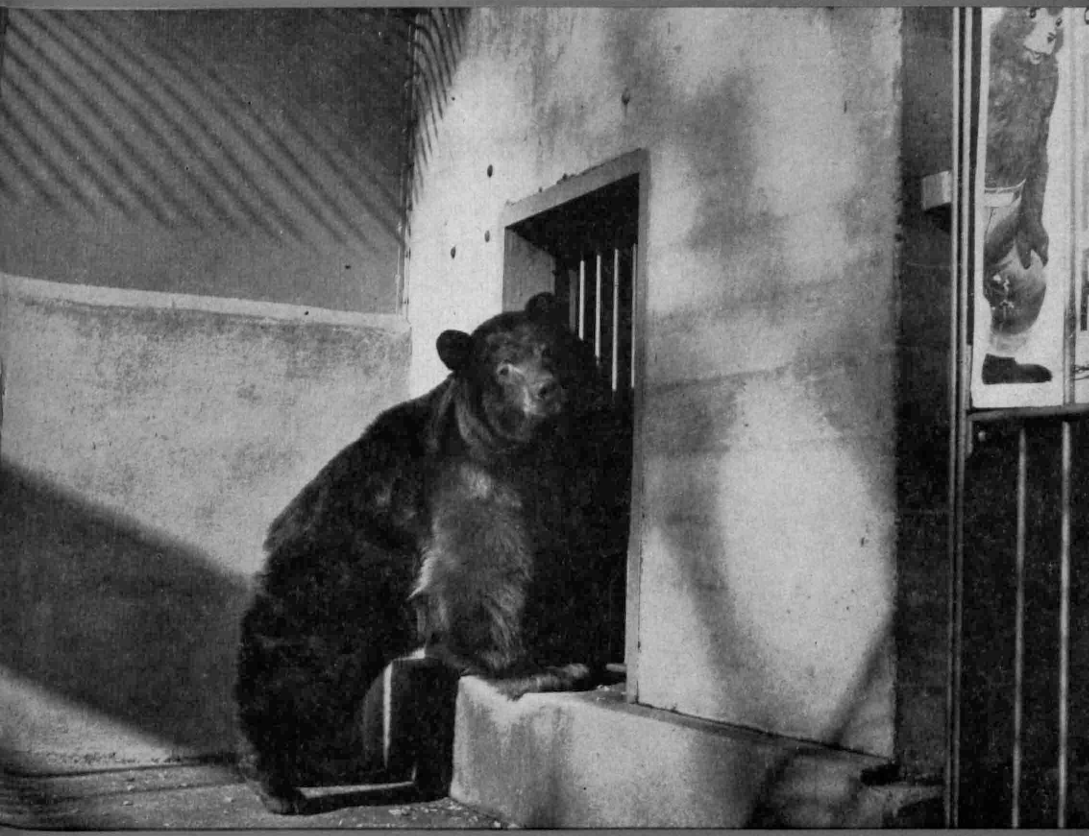
October 1, 1955
VOL. 68, NO. 14 PAGES 209-224

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Smokey the Bear

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A SCIENCE SERVICE PUBLICATION

ZOOLOGY

Asia-America Bridge

Additional evidence that land once joined Asia and North America seen in discovery of planarians in Alaska. They are first along evolution's ladder to have a "head" and "tail."

➤ WORMS from one of the lowest branches on the family tree of animal life are lending proof to the belief that Asia and North America were once joined by a land bridge.

On collecting trips in Alaska for the Arctic Institute of North America, Dr. Roman Kenk discovered four new species of the primitive worm, planaria, unlike any others known in North America. Some of his new worms were very much like planarians now found in Siberia.

The similarities of the Asian and Alaskan worms is another indication of an ancient Ice Age connection between the two continents, Dr. Kenk believes.

Because they must have been in Alaska before the bridge was broken, surviving the Ice Ages, Dr. Kenk thinks this may indicate that most of Alaska was ice free during that period, when glaciers covered most of the continent's northern half. His report was published by the Smithsonian Institution.

The tiny planarian worms represent the large group of "flat-worms," first along the ladder of evolution to have a "head" and a "tail."

Unlike the sponges, coelenterates (jelly fish and coral animals) and sea combs that come before them, planarians have a definite front end with sense organs that moves forward first, the rest of the animal dragging up in the rear.

Another first for the planaria group is a primitive "brain" (ganglia) in the front part of the body, with nerve cords extending back through the body.

The planarians have two eyespots on the back of the head. The spots are sensitive to light but form no image. Both male and female organs are present in the same individual. Planarians do mate, however, the male part of each planarian fertilizing the female part of the other.

In spite of this arrangement, planarians often reproduce by simply breaking in half about midway through their bodies. Each segment will regenerate a new, full-sized worm.

In the laboratory, planarians can be cut into small pieces, and each of the pieces will make new individuals.

Although they have a very effective mouth, planarians do not have an anus, and undigested food is ejected through the same pathway it entered. In feeding, the planarians project their pharynx (the upper part of the digestive tract) out of their body. This secretes digestive juices and, when the food is pre-digested, it is taken in, along with the pharynx.

Planarians are found in nearly every part of the world, including the U. S., usually in streams under rocks or bits of wood. An easy way to see some of the small black worms is to place bits of meat in shallow water.

If any planarians are around, they will soon swarm to the meat as its juices in the water tell them food is at hand.

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ELECTRONICS

Will Build LARC Computer

➤ A POWERFUL COMPUTER for use at the Atomic Energy Commission's Livermore research laboratory will be built by the Remington Rand division of Sperry Rand, Inc.

The new UNIVAC-type computer, 1,000 times faster than electronic computers now in use, will perform calculations for Government-financed research projects carried out by the University of California's Radiation Laboratory at Livermore.

The contract price for building the new computer is $2,895,000, and completion is expected to take two and one-half years.

The new machine will be known as the Livermore Automatic Research Computer, or LARC. It will be able to work on several problems simultaneously and in three dimensions. The three-dimensional capacities will make possible the solution in a few days of problems that now take up to two years on a UNIVAC.

The computer's projected ability to operate on several problems simultaneously may be compared to a traffic pattern in a railway system, where different trains use the same tracks at different times, with collisions being prevented by the block signal system.

In the LARC, common channels for exchange of information between "memory" banks and different operating circuits will be controlled so that the units do their work in strict schedule. Just as the block signal system in a railroad eliminates the need for extra tracks and switches, this system will save both the cost of extra channels and also the extra switches to connect the channels.

The ability of electronic computers to accomplish more than one calculation simultaneously was a feature of ENIAC, the first large scale electronic computer and the forerunner of current UNIVACS, but ENIAC required 20,000 tubes and had a storage capacity of 120 ten-digit numbers.

UNIVAC II, with 5,000 tubes, has a storage capacity of 10,000 eleven-digit numbers. The UNIVAC-LARC, with only 120 vacuum tubes, will have a storage capacity of 20,000 ten-digit numbers.

Its modular design offers possibilities of even greater storage by addition of any number of supplementary units.

The use of ferrite core storage will result in a speed never before attained in electronic computers, allowing, for example, reading data from the memory at a rate of two micro-seconds per word and reading back into the memory at the same speed.

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GENERAL SCIENCE

Jane Stafford Wins Heart Association Award

➤ MISS JANE STAFFORD, medical writer for SCIENCE SERVICE, has won one of the 1955 Howard W. Blakeslee awards of the American Heart Association for outstanding year-round reporting in the field of heart and blood vessel diseases.

Other awards, also to be presented in New Orleans on Oct. 23, went to Mrs. Frances Burns, medical editor of the *Boston Daily Globe*, William Peters of Pelham Manor, N. Y., for an article in *Cosmopolitan* magazine, and the Columbia Broadcasting System for a television program.

Science News Letter, October 1, 1955

ENTOMOLOGY

Tropical Beetle Imported To Fight Plant Pests

➤ AN INSECT IMMIGRANT is being carefully groomed for United States citizenship at the insect breeding laboratory of the University of California, Riverside.

A natural enemy of mites that attack wild avocado trees, a small, black lady beetle, *Stethorus*, was brought to the U. S. from its native home in Guatemala this spring. Insect specialists are now breeding it by the thousands for release in California avocado and citrus groves, in hopes of controlling destructive plant mites.

Over 7,000 of the Guatemalan beetles have already been released in southern counties, where they are busily eating mites and reproducing. Scientists in charge of the program are waiting to see how the beetles weather the winter months.

Since the beetle feeds on a wide range of mite species, the scientists plan to test its effects on the mite enemies of truck and field crops, and other trees.

Dr. C. A. Fleschner, associate entomologist at the University of California, reports the work in *California Agriculture* (Sept.).

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BIOCHEMISTRY

Find Diet for Cancer Cells

Seven vitamins and 13 amino acids, as well as glucose, an unidentified blood serum protein and five salts, found necessary in diet of certain human cancer cells.

➤ PRECISE DIET needs of certain human cancer cells and a mouse connective tissue cell have been worked out for the first time by Dr. Harry Eagle of the National Microbiological Institute, U. S. Public Health Service, Bethesda, Md.

As a result, cancer researchers should be able to find more quickly and directly the chemicals that might stop cancers by interfering with their nutrition.

Chemicals to fight virus diseases or vaccines to prevent them should also be developed more readily because it is now possible to tell which chemicals in the cell are used by the virus.

The cancer cells, Dr. Eagle finds, need these seven vitamins: choline, folic acid, nicotinamide, pantothenate, pyridoxal, riboflavin and thiamine (vitamin B-one).

They also need these 13 amino acids, or protein building blocks: arginine, cysteine, glutamine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan, tyrosine and valine.

Besides this, the cell diet requirements include the sugar, glucose, some still unidentified protein that is in blood serum, and salts of sodium, potassium, phosphorus, calcium and magnesium.

When any one of the seven vitamins or of the 13 amino acids was withheld from the diet of the cancer cells, microscopic signs of cell injury developed within a few days and the cells died. In the early stages, the vitamin and amino acid deficiencies could be "cured" by adding the missing substance to the diet again.

Dr. Eagle considers it may be significant that with many of the amino acid deficiencies, the damage to the cells closely resembles that from virus infection.

The polio virus, Dr. Eagle found, could live and multiply in the HeLa cancer cells even when amino acids, serum protein or vitamins were withheld from the cell diet. Apparently the virus built itself at the expense of protein or other chemicals in the cell.

When, however, both glucose and the amino acid, glutamine, were omitted from the cell diet, there was a marked reduction in polio virus production. Details are reported in *Science* (Sept. 16).

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IN "HOT" WATER—Radioactive equipment being repaired at the Atomic Energy Commission plant, Hanford, Wash., is "cooled" in this water bath so maintenance work can be conducted with greater safety. The plant is operated for AEC by General Electric Company.

ANATOMY

Human Type Bones Found In Gorilla and Chimp

➤ DISCOVERY for the first time of certain human type bones in a gorilla and a chimpanzee is announced by Dr. G. T. Ashley of the department of anatomy, University, Manchester, in *Nature* (Sept. 24).

The bones are small bones located just above the breast bone. They are called suprasternal ossicles. They are quite common in man, but until 1944 they had never been seen in primates other than man.

In that year, Dr. Adolph Schultz of Johns Hopkins University, Baltimore, reported finding them in two gibbons. They have not been reported in monkeys or orangutans.

In man the little bones were once thought to represent rudiments of the furculum, or wishbone, of birds. Now they are thought to be rudiments of a bony structure of the primitive shoulder girdle.

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PHYSIOLOGY

Nerve Gas Attack Might Be Worse in Hot Weather

➤ A HINT that nerve gas attacks might be more dangerous in hot and in cool weather than at moderate temperatures appeared in a report by Drs. Anna M. Baetjer and Raymond Smith of Johns Hopkins School of Hygiene, Baltimore, at the meeting of the American Physiological Society at Tufts University, Medford, Mass.

And if men react as mice do, farmers using nerve-gas-type insecticide chemicals, such as parathion, might be safer if they used these when the temperature is moderate.

The study reported by Drs. Baetjer and Smith was made with mice and the insecticide, parathion.

When the mice were kept at 96 degrees Fahrenheit for two to five days and then given parathion injections, symptoms of poisoning started faster, death or recovery in non-fatal cases came faster, more mice died, and the average survival time of the fatal cases was shorter than for mice kept at 73 degrees Fahrenheit before parathion injections.

The effect of high temperature was not due to a higher body temperature of the mice, the scientists said. Neither could it be laid to the rate at which parathion was absorbed at the higher temperature.

When mice were kept at temperatures of 60 and 73 degrees Fahrenheit, poisoning symptoms started and death followed at about the same rate in each group until about 20 hours after parathion injection. Then the deaths in the cold (60-degree) group began to mount more rapidly and the final mortality was greater than for the group at the moderate temperature.

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CHEMISTRY

Handling Rocket Fuels

Chemists discuss how to handle and control the potentially explosive compounds that will play an ever more important role in meeting special fuel needs.

➤ TODAY'S ROCKET fuels, fast-burning chemicals with their own oxygen supply, promise to play an increasing part in meeting special fuel needs, thus bringing their peculiar hazards to the attention of industrial and engineering specialists.

Sessions devoted to problems in storing, handling and controlling the potentially explosive compounds brought together experts in these problems of the future at the American Chemical Society meeting in Minneapolis. (See SNL, Sept. 24, p. 198.)

Protective clothing made of such synthetic fibers as Dacron and Dynel avoids the fire that breaks out when ordinary clothing is wet with concentrated hydrogen peroxide.

This protection, accompanied by a copious supply of water to dilute any of the peroxide chemical accidentally spilled, was recommended by Dr. Noah S. Davis of the Becco Chemical Division of the Food Machinery and Chemical Corp. of Buffalo, N. Y.

In spite of the fire risk and a relatively high freezing point, hydrogen peroxide, far stronger than the dilute peroxide solution commonly used for bleaching, is a standard fuel for steam turbines, submarine propulsion and rocket-assisted take-offs, Dr. Davis said, because of its simplicity and reliability.

Chemicals in the same class as hydrogen peroxide are liquid oxygen, ozone and oxygen-ozone mixtures, and fuming nitric acids. They supply oxygen to such rocket fuels as liquid ammonia, ethyl alcohol, aniline mixtures, hydrazine, hydrogen and certain petroleum products.

Other substances that supply heat by combining with these fuels include fluorine and chlorine trifluoride.

Familiarity with the use of these fuels of the future was urged by Dr. Paul M. Terlizzi of the U. S. Naval Air Rocket Test Station, Dover, N. J. Monopropellants, whose chemical structures carry both fuel and oxidizer, were listed by him as ethylene oxide, hydrazine, hydrogen peroxide and nitromethane.

Tetranitromethane was recommended as a liquid oxidizer for rocket fuels by Dr. Johann G. Tschinkel of the Department of the Army, Huntsville, Ala., because its great density allows it to store as great a weight of oxygen per unit volume of fuel as does liquid oxygen itself.

Drawbacks in its use are its high solidifying temperature of 14 degrees centigrade, or 57 degrees Fahrenheit, and its tendency to explode when mixed with other substances.

Extra precaution in handling liquid ozone was urged by Dr. G. A. Cook of Linde Air Products Company, who pointed out that there are certain concentrations of ozone mixed with oxygen below which there is little danger of explosion, but above which explosion becomes more likely as ozone concentration increases.

"If high-concentration liquid ozone is to be used as the oxidizer in a rocket fuel system," Dr. Cook said, "It should be handled by remote control for protection of personnel."

Two ways in which energy can travel back from the hot flame to the cold unburned fuel were described by Dr. O. B. Case of the Allegany Ballistics Laboratory of Hercules Powder Company, Cumberland, Md. They are direct transfer of heat and diffusion of free radicals.

When a nitrate ester is the fuel direct transfer of heat raises the temperature until the point is reached at which chemical breakdown begins.

In the diffusion method, chemicals in an unusually reactive state attack the fuel and start its breakdown. Chemists in Dr. Case's laboratory are trying to learn which of these methods has the greater effect in burning nitrate ester fuels and explosives.

Similar studies were reported by Dr. Joseph B. Levy of the Naval Ordnance Laboratory, White Oak, Md., in connection with the use of nitroglycerin and nitrocellulose as fuels and propellants.

Inspection by radiographic methods of fuels in solid form, cast directly into the rocket case and viewed with a fluoroscope, was described by Dr. Jack Buchanan of the Thiokol Chemical Corporation. He said the technique was "a step toward improving reliability and safety of the rocket."

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BIOCHEMISTRY

Hallucinating Drug Lets Blood Escape

➤ A DRUG that causes hallucinations and other symptoms of mental sickness also seems to make small blood vessels more fragile so that blood escapes from them.

The drug, lysergic acid diethylamide, does this apparently by blocking the effect of another chemical normally present in the body. This second chemical is 5-hydroxytryptamine.

The tryptamine chemical had been suspected of acting to prevent escape of blood. But because it presumably is present in the body in plentiful amounts, it was difficult to be sure of this.

Lysergic acid diethylamide had already been found a powerful blocking chemical against 5-hydroxytryptamine. So scientists at the University of Edinburgh and the Medical Research Council tested the matter by forcing small amounts of lysergic acid into the skin by an electric current.

Appearance of telltale purple spots on the skin, indicating the escape of blood from little vessels under the skin, showed that the lysergic acid had counteracted the 5-hydroxytryptamine and weakened the walls of the small blood vessels, and that the tryptamine, as suspected, has some ability to stop the escape of blood.

The research is reported in *Nature* (Sept. 17) by Drs. E. L. Blair, G. I. C. Ingram, Mavis Wakefield and P. Armitage.

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SCIENCE NEWS LETTER

VOL. 68 OCTOBER 1, 1955 NO. 14

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C., NOrth 7-2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., $5.50; 2 yrs., $10.00; 3 yrs., $14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C., under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 19, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Reader's Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 1 E. 54th St., New York 22, ELdorado 5-5666, and 435 N. Michigan Ave., Chicago 11, SUperior 7-6048.

PUBLIC SAFETY

Youths' Hunting Accidents

As hunting seasons open, the National Rifle Association urges compliance with ten safety rules that can be broken only at the risk of death or injury to the hunter.

➤ TEEN-AGERS are as accident prone with shotguns as they are with hot rods, hunting accident statistics from 22 states and two Canadian provinces indicate.

Youths 11 to 19 years old accounted for the largest share of shooting accidents of any age group during the states' 1954 season, with 352 reported accidents on file. Only the 20-to-29-year-old group, with 220 reported accidents, approached their record.

In the states reporting to the National Rifle Association in Washington, there were 305 fatal shooting accidents and 1,256 without resulting death during the 1954 season.

Shotguns were responsible for 930 of the accidents, rifles for 555, and hand guns for 44. Bows and arrows and other, unidentified weapons caused the reminder.

Self-inflicted wounds led to 487 injured or killed hunters, while 1,071 cases were caused by other hunters.

Because of the high accident rate among young hunters, 11 states have started hunting-safety schools to teach youths how to handle firearms properly.

Some of these states, like New York, will not issue hunting licenses to young people until they present a "certificate of proficiency" from a hunting-safety school. Others, like New Hampshire, have no compulsory program, but offer the safety training along with wildlife conservation courses to youths.

The National Rifle Association lists ten safety rules that can be broken only at the risk of death or injury to hunters:

1. Treat any gun as if it were loaded. This is the first rule of gun safety.
2. Guns carried into camp or home, or otherwise not in use, should be unloaded, and taken down or have actions open.
3. Be sure the barrel and actions are free from obstructions, and that ammunition is of the proper size. Remove oil and grease from chamber before firing.
4. Always carry your gun so you can control the direction of the muzzle, even if you stumble.
5. Do not pull the trigger until you are absolutely certain of your target.
6. Never point a gun at anything you do not intend to kill, even in play.
7. Unwatched guns should be unloaded. Guns and ammunition should be stored separately, and out of reach of children and careless adults.
8. Never climb a tree or fence, or jump a ditch, with a loaded gun. Never pull a gun towards you muzzle-first.
9. Never shoot a bullet at a flat, hard surface or the surface of water—to avoid ricocheting.
10. Have nothing to do with alcoholic drinks before or during shooting.

School Cuts Accidents

➤ TRAGIC HUNTING ACCIDENTS are prevented by teaching youths good hunting habits, tests by the California Department of Fish and Game show.

Only three out of more than 17,000 young people who took the state's hunter safety course last year were involved in shooting accidents in 1954, or one out of every 5,675 who took the course.

Among the 12,500 licensed hunters under 16 years old in a previous year who had not taken the course, 43 had shooting accidents, or one out of every 290.

Youths with hunter safety training have a safety record 19 times better than the untrained, according to Wildlife Management Institute, which reported the tests made in California.

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PHYSIOLOGY

Pure Sweat Odorless; Bacteria Cause Smell

➤ PURE SWEAT when it first appears on the skin has no odor. Furthermore, it is sterile, that is, germ-free, Dr. Walter B. Shelley of the University of Pennsylvania, Philadelphia, told the Society of Cosmetic Chemists meeting in New York.

Contamination of sweat with the bacteria, or germs, ordinarily found on the skin gives it "the distinctive apocrine odor of the axilla (underarms)," Dr. Shelley reported.

Chemically checking growth of these bacteria, he said, prevented the odor's appearance. Discovery of a way to collect relatively pure sweat made the findings possible.

A number of chemicals can reduce the flow of perspiration, but none seems safe enough for cosmetic use, Emil G. Klarmann, vice president of Lehn and Fink Inc., New York, told the meeting.

Common skin disorders, including superficial infections, excessive dryness, "chapping," "winter itch," excessive oiliness and excessive moisture, prickly heat and even perhaps some eczemas, may be in part or entirely due to faults in the horny layer of the skin or in the surface emulsion, or mixture, of sweat and skin oil, Dr. Marion B. Sulzberger of New York University-Bellevue Medical Center, New York, said.

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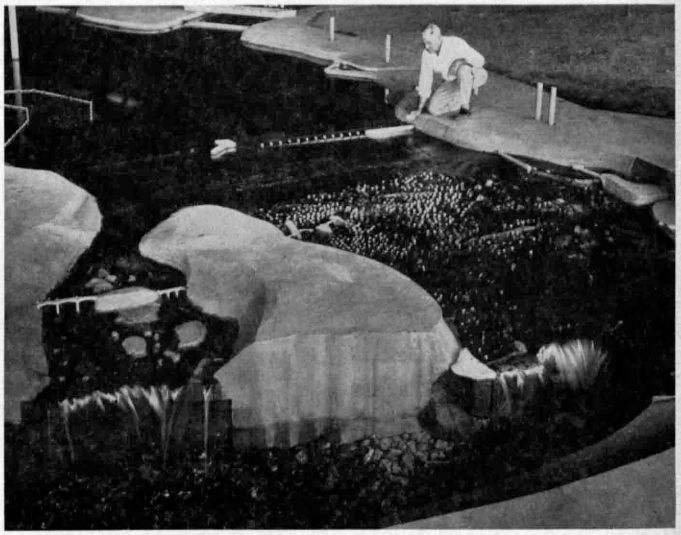

MINIATURE NIAGARA—At the Waterways Experiment Station, Vicksburg, Miss., Army Engineers test proposed improvements of rivers and harbors on accurate scale models. Here an engineer removes the miniature gate from a proposed regulating dam in a project aimed at improving the Niagara River, preserving and enhancing the beauty of Niagara Falls, while compensating for effects of additional diversions of water for power purposes.

BIOLOGY

Old Age as Cancer Cause

If same relations hold in man as in one-celled paramecia, old age itself may be primary cause of cancer. Scientists find that chromosomes often act abnormally with old age.

➤ OLD AGE itself may be a primary cause of cancer, a team of Indiana zoologists suggested at the American Institute of Biological Sciences meeting in East Lansing, Mich.

If the same relations hold in man as in the one-celled animals, paramecia, the scientists speculate, an increase in the average age at reproduction might be as harmful to man's heredity as the increase in background radiation from exploding atomic bombs.

Experiments with the "aged" one-celled animals revealed that the carriers of hereditary traits in each cell, the chromosomes, often act abnormally with increasing age. As the cells grow older, instead of remaining separate and distinct at the time of cell division, the chromosomes clump together and tear apart unnaturally.

This results in freakish daughter cells bearing hereditary traits different from the parent cell—a situation also found in cancerous cells.

Since cancers are known to appear mainly at advanced ages and to be associated with chromosomal abnormalities of this sort, it may be possible that age changes themselves are a primary cause of cancer, Drs. T. M. Sonneborn, Myrtle Schneller and Ruth Dippell of Indiana University, Bloomington, Ind., reported.

In their experiments with paramecia, they also found hereditary damage in the offspring of old parents that caused many weak or non-viable new individuals.

The paramecia used in the tests ranged from vigorous youths of seven days to one-celled Methuselahs of 83 days or older. No paramecium lived longer than 123 days.

Diet Causes Gallstones

➤ A DIET free of cholesterol, the chemical that plays a large part in hardening of the arteries, leads to the formation of gallstones in experimental animals, Dr. Hulda Magalhaes of Bucknell University, Lewisburg, Pa., said at the meeting.

Cholesterol-free diets are often prescribed for human patients with certain blood circulation troubles. Dr. Magalhaes said she did not know of any studies that would show if cholesterol-free diets lead to human gallstones.

She plans to bring the matter to the attention of medical researchers who might watch for this unwanted side-effect she saw in laboratory-bred golden hamsters.

A fat-free diet also led to gallstones in the laboratory animals, at a rate about half that of the cholesterol-free diet.

Dr. Magalhaes said now that gallstones can be induced almost at will in laboratory animals, scientists have a tool to learn how to prevent or eliminate them. By feeding animals a gallstone-causing diet, but adding experimental substances such as vitamins or controlled amounts of other food substances, they might find ways to counteract gallstone formation.

Lack of cholesterol itself in the diet may not be the ultimate cause of the gallstones, she said. To get a cholesterol-free diet or a fat-free diet, the animals must be fed a higher proportion of other foods to give them enough daily calories. Thus, perhaps the increased amounts of carbohydrates in their rations, or a vitamin deficiency in the new diet, is the actual cause of the gallstones.

This is what Dr. Magalhaes hopes to learn in future experiments.

"Hitchhikers" Hit Hosts

➤ "HITCHHIKERS" that feed on their amiable host when it is wounded or sick were described at the meeting by New York scientists.

They are the harmless microscopic one-celled animals, epibionts, that normally use healthy fish as a convenient resting spot for a free ride.

Weakness of the host fish transforms the one-celled creatures into aggressors, and they savagely feed on its broken-down cells and oozing body fluids. They may eventually invade the fish's blood stream and deeper body structures, Dr. Ross F. Nigrelli of the New York Zoological Society and his associates, Sophie Jakowska and Morton Padnos, reported.

Multiplying on this new diet, the epibionts may aggravate the wounds or poison the fish with substances produced by their activity. Thus damage, disease and even death may be caused by these otherwise harmless microscopic animals.

The scientists do not yet know whether this sudden change to an aggressive existence permanently affects the habits of these tiny creatures, who temporarily give up their free and independent life to become dependent—although fat—parasites.

Drugs Can Save Hives

➤ HONEYBEE disease epidemics that may spread with lightning speed through the congested quarters of a beehive can be stopped by use of antibiotics and sulfa drugs, Dr. H. Katznelson of the Canadian Department of Agriculture, said.

Antibiotics, such as terramycin, streptomycin and fumagillin, and sulfa drugs will give successful control over the destructive diseases, American and European foulbroods, that attack larval bees, and nosema, a killer of adults.

Before use of these chemicals, bee growers had to destroy diseased hives to avoid further spread, a costly and not always effective treatment.

Inherit Music Taste?

➤ IF PROGRESSIVE JAZZ just does not "send" you, hang the blame on your family tree.

Such subtle matters as one's taste in music may be pre-ordained to some degree by hereditary make-up, research reported at the meeting indicated.

A series of tests with identical twins showed that each twin resembled the other of the pair in personality traits so much that only their identical hereditary background could account for it, Dr. Steven Vandenberg of the University of Michigan said.

Use of the hands, skill with words, analytical thinking, and personality quirks, such as stubbornness, all show a basis in heredity, he said.

Identical twins arise from a single egg that divides after fertilization to form two complete individuals. These two offspring from the same egg are identical in their genetic make-up.

Fraternal twins, on the other hand, come from two separate fertilized eggs and are no more alike genetically than any other two brothers and sisters.

In the experiment, Dr. Vandenberg gave a psychological test to 45 pairs of identical twins and to 37 pairs of like-sexed fraternal twins. The identical twins scored alike so many times that only the inheritance of certain psychological traits could account for the findings, he said. The fraternal twins differed in their scores.

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NATURAL RESOURCES

Snow Studies May Yield Water Shortage Relief

➤ A TEN-YEAR investigation of snowfall and snow water runoff in the peaks of the Sierra Nevada is being made by the U. S. Forest Service.

From data gathered, the scientists hope to develop methods of timber cutting and other land management practices on mountain slopes by which accumulation and melting of snowpacks can be controlled.

As part of a nation-wide program to learn more about the basic problems of watershed management control, Congress this year made funds for the research available.

Winter snowpack is the source of 40% of California's streamflow, Dr. George M. Jemison, director of the Forest Service's activities, Berkeley, Calif., said.

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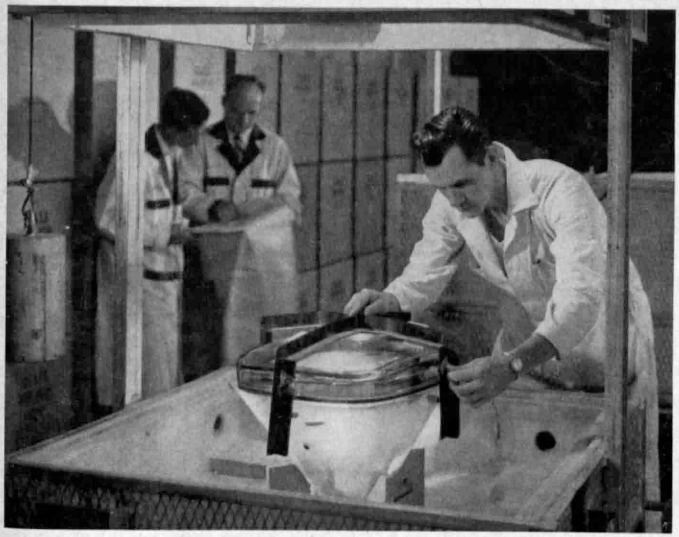

COLOR TELEVISION BULBS—An employee of Owens-Illinois Technical Center, Toledo, Ohio, is shown here joining a picture tube face plate, clamped into place, to a funnel in an experimental oven. To make the seal, he is using a low-temperature glass solder, developed by the company, expected to find use in color television.

MEDICINE

Slow Polio Paralysis

➤ THE PARALYTIC PROCESS in poliomyelitis is halted in 48 hours instead of five to seven days by injections of the anti-inflammation enzyme, trypsin, Dr. George J. Boines of Wilmington, Del., reported at the meeting of the Ohio Academy of General Practice in Dayton, Ohio.

The trypsin treatment was only started in 1954. Dr. Boines said more cases will have to be studied before these preliminary results can be confirmed.

He made it clear that there is no known specific treatment for polio, and that it is only possible to treat each damaging effect of the disease.

In the state of Delaware in the past 13 years, including the pre-trypsin period, 91% of the polio patients have recovered completely, Dr. Boines reported. This is better than the national average.

"Relaxotherapy" is the name he gives to the treatment he uses at the Wilmington General Hospital, which includes:

1. A modification of the Sister Kenny method of packs and exercises.

2. The Old Indian arrow poison, curare, to lessen pain so exercises can continue uninterrupted.

3. A high protein diet for building muscles and infection-fighting globulin.

4. A combination of vitamins C and P to restore proper function to the small blood vessels that are affected in polio and to aid circulation.

5. Injections of adrenocortical hormone to fight stress.

A relaxing drug called Dimethylane is given both to the patient and to the parents to reduce tension, worry and anxiety.

Questioned about the Salk vaccine, Dr. Boines said it was too early to make any evaluation.

"In Delaware, our experience is such that we cannot feel justified in calling it safe or effective," he said.

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MEDICINE

Brighter Fluoroscopic Screens for X-rays

➤ BRIGHTER FLUOROSCOPIC screens for X-rays in hospitals and doctors' offices were forecast by Dr. Ferd E. Williams of the General Electric Research Laboratory, Schenectady, N. Y., at the American Roentgen Ray Society meeting in Chicago.

The brighter images will be possible without the use of vacuum tubes and three methods of doing this are being investigated.

Science News Letter, October 1, 1955

TECHNOLOGY

Lighter Glass Jars and Glass Solder Produced

➤ TWO DEVELOPMENTS in glass research, a lighter-weight glass container and a low-temperature glass solder, were announced at the Owens-Illinois Technical Center, Toledo, Ohio.

The glass container, 20% lighter but still stronger than similar containers, is made by a new method of controlling heat transfer from the glass as it leaves the furnace.

The process cools the jars rapidly and induces controlled stresses, making the glass much stronger than ordinary annealed glass.

In announcing development of the glass solder, Carl R. Megowen, president of Owens-Illinois, said its use may expedite color television broadcasting. The solder is now being used experimentally on color television tubes.

It is an all-glass solder giving a permanent seal, which can be opened and resealed by heating. This enables the working parts of the bulb to be installed or removed for repair without destroying the bulb.

Science News Letter, October 1, 1955

ARCHAEOLOGY

Dice Games Entertained Prehistoric People

➤ SPORTING MEN thousands of years ago really did roll bones in dice games.

Archaeologists digging in prehistoric sites have turned up large numbers of roughly diced-shaped bones, called astragalia, that seem to have once been used in games.

These bones from the feet of hoofed animals have four long, flat surfaces, which probably were given values, and regular games of chance were set up. The Greek poet Homer mentions such games for which a special jargon was developed. The throw of Venus was good. The throw of the vulture or the dog was bad.

Cubical dice have been found in later sites. Some of the dice are made of bone. Hard glazed pottery was frequently used, but other materials, ranging from iron to crystal, were also used.

The arrangement of the values varied greatly in early times, but eventually settled down to the present style of a sum of seven on opposite faces.

Dice made of geometric forms, other than the cube, followed the discovery of the regular-faced symmetrical solid figures by the early Greek mathematicians. However, for long years, no one seems to have thought about the "fairness" of dice, or the equal probability with which faces fall, or should fall.

In the sixteenth century the gambler-mathematician - philosopher, Cardano, studied the game of dice and wrote a book on the subject. Galileo also wrote about them. Other famous men followed in their time, laying the foundations for a useful part of modern mathematics.

Science News Letter, October 1, 1955

CHEMISTRY

Treasury of Chemicals Urged as National Asset

➤ A WELL-FINANCED PROGRAM for producing pure samples of a selected list of rare hydrocargon chemicals, including fluorocarbons, was advocated by Dr. Joel H. Hildebrand, president of the American Chemical Society, as a national resource.

Preparation of these compounds for use in handling uranium for atomic bomb development during the last war proved a difficult and expensive undertaking. Ability to draw on a treasury of chemicals kept in preparation for the sake of their theoretical usefulness would be a boon to chemists faced with similar emergency problems in the future, Dr. Hildebrand said.

Great varieties of new products will extend the list of slow-burning organic materials useful at high temperatures, it was revealed at special sessions, devoted to new fluorine compounds, at the American Chemical Society meeting in Minneapolis.

Skill in using the spectacular element fluorine, which burns readily but forms fireproof compounds, has increased since the war.

Chemists familiar with the development of new materials resulting from this progress described oils and waxes, organic acids and materials that promote mixing of dissimilar liquids, all containing fluorine, many with the addition of chlorine.

Silicones also can be combined with fluorine-containing substances, to combine the useful qualities of both series of new materials.

Science News Letter, October 1, 1955

TECHNOLOGY

Truck-Train Rolls Over Jungle, Desert, Snow

➤ TRACKLESS WASTELANDS will be broad highways for a new truck-train with huge balloon-like tires developed in Longview, Tex.

The cross-country carrier can criss-cross the deserts, glide through jungles and roll over Arctic snow without bogging down. It is believed to offer promise for commerce with underdeveloped areas without roads.

Cars in the train are connected mechanically by a steering arrangement that makes every car follow the tracks of the lead truck.

The train can climb steeper inclines than an auto and can roll smoothly over stumps and ditches. Tires on the cars range up to ten feet in height. Some are four feet wide, with 50 times the ground contact area of an ordinary automobile tire.

The tires operate on as little as five pounds of air pressure, allowing the mechanical caravan to roll over loose snow and sand.

Each wheel in the truck-train, developed by R. G. LeTourneau, Inc., is powered by its own electric motor. One car carries a generating plant that supplies the energy to all the wheels.

A six-car train with six wheels per car would have a 36-wheel drive that would keep the train moving over almost any overland conditions.

The train will run faster on a good road than a bad one, but it can be operated successfully along rough jungle trails until the way is cleared.

A six-car freighter has recently been delivered to northern Alaska, the company said, to transport freight to isolated areas. The Army Transportation Corps has also ordered the new transport.

Another eight-car train is being used to move timber and heavy equipment at the company's proving ground.

Science News Letter, October 1, 1955

HEMATOLOGY

Rh Blood Group Antigen Common in Negroes

➤ DISCOVERY OF a new blood group antigen belonging to the Rh system is announced by a group of American and British scientists in the *Journal of the American Medical Association* (Sept. 24).

The new blood group antigen is called V, that being the initial of the patient in whom it was discovered at St. Luke's Hospital, New York.

V is common in Negroes and rare in white persons. Of 150 West Africans, 60 had V. Of 168 New York Negroes, 45 had it. Of 407 London whites, two had V, and of 444 New York whites, two had it.

V is inherited as a dominant Mendelian character.

Scientists reporting the discovery are Dr. Albert DeNatale, Dr. Amos Cahan and James A. Jack, New York, and Drs. Robert R. Race and Ruth Sanger, London, Eng.

Blood samples from West Africa were supplied by Dr. D. A. Cannon, Lagos, Nigeria, Dr. J. N. Marshall Chalmers, London, Eng., Dr. G. M. Edington and I. Sackey, Accra, British West Africa.

Science News Letter, October 1, 1955

SEISMOLOGY

Earthquake-Like Record Set Off by Large Fireball

➤ THE LARGE FIREBALL METEOR that passed over the southeastern states on April 21 caused an earthquake-like tremor picked up by the seismograph at the University of North Carolina.

As the fireball passed over North Carolina, it produced a brilliant blue-white flash of light, followed by a loud explosion heard over an area of about 100 miles radius.

The earthquake-like record was probably made by the shock wave of this supersonic missile, Gerald R. MacCarthy reports in *Earthquake Notes* (June), publication of the eastern section of the Seismological Society of America.

Science News Letter, October 1, 1955

IN SCIEN

MEDICINE

No Danger of Rh Trouble From Salk Polio Vaccine

➤ MANY DOCTORS have been concerned that children getting repeated injections of Salk anti-polio vaccine from virus grown on monkey kidney tissue might become sensitized to Rh blood antigens.

This would be especially bad in the case of an Rh-negative girl.

Reassurance that there is no danger of this happening now comes from studies reported by Drs. Neva M. Abelson, Robert M. McAllister, Arthur Greene and Lewis L. Coriell of Philadelphia in the *Journal of the American Medical Association* (Sept. 24).

They made tests of the vaccine, of children given vaccine in the field trials in 1954 and of volunteers who had been sensitized to Rh blood antigens. The antigen is the substance that causes anti-Rh antibody formation with sometimes disastrous results.

"The tests used for this study," the doctors state, "are the most sensitive tests for the presence of Rh antigens that can be devised or imagined in the present state of knowledge, and they do not show even a trace of Rh antigens in the lots of Salk vaccine tested."

It seems probable, they say, that "there is no danger of Rh sensitization of man by the Salk vaccine."

Science News Letter, October 1, 1955

SURGERY

Correct Funnel Chest In Adults by Surgery

➤ AN OPERATION by which "funnel chest" can safely be corrected in grown-ups as well as in children was announced by Dr. Colin A. Ross of Edmonton, Can., at the meting of the U. S. and Canadian sections of the International College of Surgeons in Philadelphia.

"Funnel chest" is an acquired deformity of the chest wall, developing progressively after birth. In later life, particularly, there may be interference with breathing and heart action. The deformity may be easily disguised by clothing but, in the nude or in a bathing suit, the appearance is unsightly.

The operation involves separation of cartilage from the ribs. The breastbone is elevated to its normal position. Two braided stainless steel wires are passed under the breastbone, brought out through skin flaps and fastened to a cast over the chest.

The patient is up from the first postoperative day, there is a remarkable freedom from pain after 48 hours, and the cast is removed in eight days, Dr. Ross said.

Science News Letter, October 1, 1955

CE FIELDS

MEDICINE

Search for Polyps to Prevent Cancer Deaths

➤ DEATHS from cancer of the lower part of the large intestine, now responsible for 17% of all cancer deaths, might be prevented by more concentrated X-ray search for polyps in this part of the intestines, Dr. J. Maurice Robinson, San Francisco, told the American Roentgen Ray Society meeting in Chicago.

Polyps are small growths which may be non-cancerous but which are believed capable of developing into cancers. In some cases, signs of cancer can be seen in slices of polyps examined under the microscope when the gross appearance of the polyps is not cancerous.

"A good part of the solution of the problem of cancer in this region (large intestine) lies in the detection of these tumors before they have become invasive or have metastasized (spread)," Dr. Robinson said.

The search for these polyps, however, is difficult, he pointed out. Injection of a radiopaque substance is followed by X-ray examinations made in several ways. Dr. Robinson said he has been forced to the "unhappy conclusion" that there are pitfalls in any of the methods.

"The procedure which works well on one day will not work well on another; and on some days, none of them seems to be any good," Dr. Robinson has concluded.

He said one important element in assuring moderate success in finding these tricky growths is the earnest conviction on the part of the diagnostic radiologist that it is important to find them.

Science News Letter, October 1, 1955

ELECTRONICS

Teach Electronic "Brain" To Find Word Meanings

➤ A NEW METHOD for finding the various meanings of a foreign word to be translated by an electronic "brain" is reported by Dr. Andrew D. Booth of Birkbeck College Computational Laboratory, London, in *Nature* (Sept. 17).

Dr. Booth's method for instructing the computer to find the right word in its dictionary "memory" resembles that used by young children first learning to handle a dictionary.

Opened at the middle, both the child and the computer then decide whether the desired word is before or after that point. The chosen section is again divided in half, and the process repeated until the searched for word has been located.

An extremely difficult problem still to be solved is selecting from among the meanings the one that makes sense in the sentence to be translated by the computer.

For a dictionary of 10,000 words, Dr. Booth says "14 comparisons will isolate any given word." For a million-word dictionary, 20 comparisons would be sufficient.

When a computer is doing the searching, it should take less than a fiftieth of a second to find a word's meanings, Dr. Booth calculates.

An "amusing" lecture demonstration can be based on the process Dr. Booth outlines. A member of the audience selects a word at random from the Concise Oxford Dictionary. By asking a maximum of 14 questions, the lecturer is able to find the word selected. A simple form of the question is "Does the word come before . . . ?" in the dictionary.

A rough division of the dictionary into one-half, one-fourth, one-eighth, etc., by eye is sufficient, Dr. Booth states.

Science News Letter, October 1, 1955

ENTOMOLOGY

"Counterfeit" DDT Cuts Resistant Flies' Defenses

➤"COUNTERFEIT" DDT added to the standard insecticide may offer the means to break through the protective mechanism of DDT-resistant insects.

Hunting for more effective DDT-like chemicals, four Israeli scientists prepared a chemical group with a structure similar to DDT, called the diaryl-(trifluoromethyl)-carbinols. Alone, the new chemicals were not much good as insecticides. When added to DDT, they caused it to give much higher kills of DDT-resistant flies.

To explain the chemicals' effect, the researchers suggest that once in the flies' bodies, the "counterfeit" DDT may preferentially fill up the sites where resistant flies are able to inactivate DDT. Once these sites are filled by the other chemicals, the true DDT is left free to perform its lethal job, just as it does in non-resistant flies.

Ernst D. Bergmann of the scientific department, Israeli Ministry of Defence, and A. S. Tahori, A. Kaluszyner and S. Reuter of the Israeli Defence Forces Medical Corps report the research in *Nature* (Aug. 6).

Science News Letter, October 1, 1955

BIOLOGY

Plant Kills Flying Bat

➤ "BUILT-IN RADAR" did not keep one bat from running headlong into disaster at the Shetek Lake State Park near Currie, Minn.

The tiny bat was found entangled and dead in a clump of burdock seeds, caught fast in the many barbed spines that cover the seed coats. Park naturalists speculate that the bat swooped close to spiny burdock seeds in pursuit of insects, was hopelessly caught in the barbs and died of stravation.

Science News Letter, October 1, 1955

SOCIOLOGY

Comics Have Existed For 20,000 Years or More

➤ THE HORROR COMICS that have parents, publishers and politicians in a dither are no more than technological refinements of 20,000-year-old cave drawings.

The comics, and particularly the more violent ones, have been around for 20,000 years and have been the subject of attack for almost as long, Dr. Charles F. Gosnell, New York State Librarian, told a Society of Engineers of Eastern New York meeting at Union College, Schenectady, N. Y.

Even the earliest drawings and comics were about violence, killings and oversexed persons. Comedy itself, Dr. Gosnell said, has been often "rustic, rural and crude." No one would call Dante's Divine Comedy pleasant, he added, but nevertheless it is a comedy.

"There seems to be a fundamental human urge for this type of thing," Dr. Gosnell told SCIENCE SERVICE.

"Like other urges, they can be made subject to some intelligent direction, but cannot be eliminated."

Comics are not all good or bad, he said. He pointed out three factors that those who are concerned with the problem should keep in mind:

1. Man has survived comics.
2. The picture story technique is very useful in modern times.
3. Those perturbed about the bad influence of comics should concern themselves in a positive way, such as getting better children's books for their libraries.

Science News Letter, October 1, 1955

HOROLOGY

Space Clock Tells Time On Earth and Mars

➤ A CLOCK that tells the time and date on Mars has been developed.

Its many dials may report that it is 24:30 o'clock on Sept. 52 in the year 3533. This may seem like a crazy, mixed up clock, but it could be telling the truth. There are 24 hours, 37 minutes and 12 seconds in a day on Mars. And Martian months are as long as 56 days.

The Hamilton Watch Company, Lancaster, Pa., put the timepiece on display at the Instrument-Automation Conference in Los Angeles, to show the kind of clock space ships of the future may have. As clocks in the television news studios tell the time in the world's major cities, space ships would need a clock telling the time both on earth and at their destinations.

Dr. I. M. Levitt, director of Fels Planetarium of the Franklin Institute of Philadelphia, conceived the "space clock" and made the astronomical calculations for it. R. B. Mentzer, assistant director of research in charge of process development for the Hamilton Watch Company, did the mechanical design.

Science News Letter, October 1, 1955

FORESTRY

The Bear That Stops Fires

"Smokey the Bear" has captured the kids, making half a million of them into Junior Forest Rangers, as militant an organization as you will ever want to find.

See Front Cover

By WILLIAM GRIGG

➤ "SMOKEY," the cinnamon-colored bear that looks down from the poster and says, "Only YOU Can Prevent Forest Fires," is the most powerful force in stopping forest fires in the U. S. today, Forest Service workers say.

What has he done?

He has captured the children. The kids will lecture for an hour if you get careless with matches or cigarettes. Today's youngsters will tell you exactly what that ashtray is for, and what car windows are not for.

Many of these youngsters know more about fire safety than their elders. And no wonder. They sleep with a big Smokey "Teddy" Bear, wear Smokey "T" shirts, dungarees and belts, eat Smokey cookies, read Smokey comics, and even take a Smokey bubble bath.

Each of these products carries a fire prevention message, including an invitation to join the Smokey Junior Forest Rangers. About one-half million children are now members.

Adult Members Also

The list of adult members who are selected on the basis of outstanding fire prevention work, reads like a page from "Who's Who."

The list of notables includes President Eisenhower, former President Truman, the governors of most of the states, and a most industrious fire prevention worker and "personal friend" of Smokey, a cowpoke named Hopalong Cassidy.

The Forest Service of the U. S. Department of Agriculture helps establish Junior Ranger Clubs and sends free membership cards and badges to those who request them.

One request came from Pasedena, Calif. In big print it read:

"Would you please send me another Smokey badge mine broke . . . Thank you very much, James Roosevelt Jr."

A North Dakota girl wrote: "I read that it cost billions of dollars to pay for the damage caused by fires so I am contributing five cents to help pay for the damage."

"Smokey Bear has been enrolled on our Permanent Record Cards as a member of the 5-B Class of Agnes Cotton School, San Antonio, Texas."

One exasperated young girl wrote Smokey, "I have tried to break daddy from throwing out cigarettes from the car."

One boy went to the top: "Dear Master Eisenhower, I sent for some Smokey Bear things . . . I would appreciate if you could help me . . ."

Each day, Smokey gets about a thousand such letters. Some have Smokey seals stuck on them in place of postage stamps, but they still go through the mails.

The letters are not all from the U. S. Smokey has reached such places as Thailand (Siam), and the Fiji Islands. The Mexicans have adopted and adapted Smokey; south of the border he wears a straw sombrero.

"After all this, only a Moscow postmark could impress us," one Smokey staff member said.

Letters Are Delivered

The addresses on the letters are often pretty weird. "Smokey Bear Headquarters, Washington, D. C.," is the proper address, but the Central Post Office in Washington, D. C., has gotten used to letters addressed to "Smokey, U. S. A." or "Bear Headquarters, Washington."

The Forest Service likes being "Bear Headquarters." J. Morgan Smith, assistant director of the Smokey campaigns, keeps files of outstanding letters, works below a huge picture of Ike holding a Smokey "Teddy" Bear.

Mr. Smith speaks of Smokey as a "natural." Children love "Teddy" bears and, next to a pretty girl or a cute baby, nothing attracts adults like an animal, advertising experts say.

Smokey is more than a good "stopper." He is always easily identified with his fire message, because he is an animal of the forest and is dressed in the dungarees and hat of a forester. A survey by the Psychological Corporation of New York shows that Smokey and his message are identifiable by as many persons as can identify some of industry's most famous trademarks.

Credit Advertising Council

Much of the credit for this belongs to the Advertising Council, a non-profit service organization of private business, and an outgrowth of the War Advertising and Council that helped boost civilian morale during World War II.

During the War, the Council helped conduct a forest fire prevention campaign, using the slogan "Careless Matches help the Axis."

At the end of the War, the cooperative campaigners — the Council, U. S. Forest Service and state foresters—began to look around for a peacetime symbol. They experimented with Disney's "Bambi" and several other animals, but these somehow failed to capture the public's imagination. People sympathized with the animal victims of fire, but deer and squirrels and the other test animals could not be easily identified with the hard work of preventing forest fires.

The campaign officials, in a huddle over the character problem, came up with the idea that a bear might be the ticket. A bear is appealing, yet strong.

Smokey was born.

Portrait of a Bear

The bear idea grew under the skilled brush of Albert Staehle, famed cover artist for the *Saturday Evening Post.* Commissioned to do a special poster for the 1945 campaign, Staehle painted the bear pouring water on a campfire.

In the poster, Staehle had put a ranger's hat on the bear and stuck him in a pair of Levi's. Foote, Cone and Belding, the Los Angeles agency that voluntarily handles the Council's fire prevention advertising, felt the bear was "right."

The bear was named "Smokey" after Smokey Joe Woods, a well-known New York City fire chief. Now Smokey was ready for his debut.

In street cars and buses all across the nation, 90,000 cards were installed of Smokey reminding folks about their part in saving the forests.

After five years as a star poster figure in the national forest fire campaign, Smokey the Bear came to life.

For some time, Stuart Peabody, originator of Borden's "Elsie," had been urging that a live Smokey be used in campaigns. Then, a carelessly thrown cigarette started a forest fire in New Mexico that wiped out 15,000,000 board feet of timber. Unestimated numbers of wildlife were killed, and a little bear cub was orphaned.

Washington Zoo Now Home

Rescued from the disaster, the cub was cared for by a Santa Fe veterinarian, who healed the cub's burned feet. Through the cooperation of the New Mexico Game and Fish Commission, the cub was named Smokey.

The young celebrity needed no press agent. Newspapers, describing him as "the incarnation of a teddy bear," kept their readers informed as to little Smokey's health and diet, which was pablum and honey mixed with milk.

The National Zoological Park in Washington was designated as Smokey's home and, when he was flown there from New

Mexico, the papers reported he "obviously loved air travel, slept most of the time, waking to scratch his ears when the plane was descending."

At Washington airport, crowds of kids braved a rainstorm to meet their idol when he arrived by private plane. President Truman ordered that the cub be received in the airport's Presidential Room, which is reserved for distinguished official visitors.

At the reception, Smokey nibbled idly on the expensive green rug, curled up with his bottle and fell asleep. Then he was whisked off to the zoo. He got a formal reception and took up permanent residence there.

Smokey is a big bear now, a beautiful, reddish bear that could well have been the model for the poster in his cage.

In May of 1952, a pressure group pushed an unusual bill through Congress. The bill made "Smokey the Bear" a kind of trademark of the U. S. Forest Service, state foresters and the Advertising Council. The pressure group was an unorganized but effective lobby of hundreds upon thousands of American children.

Smokey, who had begun as a poster character for the fire prevention campaign, had been adopted by the youngsters.

The "living model" for fire prevention campaign posters lives in a fireproof home at the zoo. There he draws crowds of kids who learn, "Only YOU Can Prevent Forest Fires," which the photograph on the cover of this week's SCIENCE NEWS LETTER shows in part.

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ARCHAEOLOGY

First English Colony

➤ HARDY MEMBERS of America's first permanent English settlement had their "little luxuries" along with hardships and starvation, recent finds at the site of the Jamestown, Va., colony have disclosed.

Archaeologists and laborers are working overtime excavating the historic site to uncover its buried secrets before the 350th anniversary celebration of the Virginia colony in 1957, John L. Cotter, the project's archaeological supervisor, told a U. S. National Park Service audience in Washington.

Jamestown was founded by Capt. John Smith May 13, 1607.

Among recent discoveries is a pit used by the enterprising colonists to store ice cut in the winter from frozen ponds. The ice was buried in the pit with alternate layers of straw, allowing the colonists to have cool wines and foods through the hot Virginia summer.

Archaeologists Cotter and E. B. Jelks have reluctantly concluded that the original wooden fort, constructed in 1607, has been washed away by the James River.

Other important finds, however, have shed light on how the pioneers lived. In one spot, the scientists turned up a little "industrial complex," remains of a brick house that apparently served as a shop for pottery and iron work. Nearby they found its pottery kiln and a forge.

Associated with the shop was a "borrow pit," from which clay was taken for the pottery industry. This pit had been filled with the refuse of the 17th century colony, and from its "junk," the archaeologists recovered valuable items.

Among the treasures were the front and back plates of a pikesman's suit of armor, called a cuirass, and a swept-hilt rapier, all dating from the first quarter of the 17th century.

The archaeologists also explored the ruins of the third and fourth state houses at Jamestown, and discovered a cemetery of some 300 buried under them. The graves probably go back to the first settlers, Mr. Cotter said, and very likely contain individuals who perished in the "starving time," in the winter of 1609-10, from which 50 settlers out of some 500 survived.

Other important finds at the Jamestown site include:

Remains of a possible mansion-type house, which was possibly a public building, dating from 1650-75. It had been burned at least twice.

Remains of a multiple-unit house, 170 feet long and 21 feet wide, which served to house several families. It probably was built from 1675 to 1695.

The remains of the original plantation of Governor Berkeley at Greenspring, about four miles from Jamestown.

A very early forge found under the ruins of an old Confederate fort. Several flintlocks from ancient guns were recovered around the forge, where they had obviously been exchanged for new ones. This forge dates from 1607-25.

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BIOPHYSICS

Ultrasound Pierces Brain Bloodlessly

➤ BETTER TREATMENT of sickness caused by disease or damage to the brain and central nervous system may come from brain-piercing studies at the bioacoustics laboratory of the University of Illinois.

The brain-piercing is done by ultrasound waves. These can be focused either to the gray matter or the white matter of the brain by appropriate dosages. Only the part focused on is damaged. There is no bleeding. In fact, blood vessels are most resistant to the action of sound.

As a result, scientists feel they have a "unique tool" for basic studies in neurology and for working out neurosurgical procedures.

The method is reported by Drs. W. J. Fry, J. W. Barnard, F. J. Fry, R. F. Krumins and J. F. Brennan in *Science* (Sept. 16).

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Books of the Week

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

THE AUTOMATIC FACTORY: A Critical Examination—Stephen A. June and others—*Instruments Publishing*, 81 p., illus., $1.50. Attempting to bridge the gap between the theoretical concepts and the actual industrial developments of the automatic factory.

BASIC SYNCHROS AND SERVOMECHANISMS—Van Valkenburgh, Nooger & Neville, Inc.—*Rider*, 2 Vols., 259 p., illus., paper, $5.50 a set, $2.75 per volume. This text, taught at Navy specialty schools, presents the subject without involving complicated mathematics.

THE FIRST BOOK OF HOLIDAYS—Bernice Burnett—*Watts*, 62 p., illus., $1.95. Telling about holidays celebrated in America, their origin, and customs associated with their observance.

FORESTRY HANDBOOK—Reginald D. Forbes and Arthur B. Meyer, Eds.—*Ronald*, 1212 p., illus., $15.00. Prepared as a working reference, this volume contains facts, techniques and working methods of modern forestry as practiced in the United States and Canada.

FOUNDATIONS IN THE DUST: A Story of Mesopotamian Exploration—Seton Lloyd—*Penguin*, 256 p., illus., paper, 65 cents. Telling of pioneer archaeologists working in Mesopotamia, and extending the story to include excavations of more recent times.

FRONTIERS OF ASTRONOMY—Fred Hoyle—*Harper*, 360 p., illus., $5.00. In a science where most experimental work can be done only by observation, chance, according to the author, is used too often in astronomy to explain things not clearly understood. This book is an attempt to write coincidence and chance out of the field of astronomy.

GENETICS IS EASY: A Handbook of Information—Philip Goldstein—*Lantern Press*, 2nd ed., 238 p., illus., $4.00. Revised and enlarged to include more information about many of the new concepts in heredity.

GLASS FIBERS WITH ORIENTED CHAIN MOLECULES—Martin Goldstein and T. H. Davies—*Mellon Institute*, 4 p., illus., paper, free upon request direct to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa.

A GUIDE FOR THE ORGANIZATION OF FIRE SAFETY IN MODERN INDUSTRIAL ESTABLISHMENTS—NFPA Industrial Committee—*National Fire Protection Assn.*, 18 p., paper, 35 cents. Intended as an outline in development of a fire safety organization on the plant and the multiplant basis.

HAWLEY'S TECHNICAL SPELLER—Gessner G. Hawley and Alice W. Hawley—*Reinhold*, 146 p., $2.95. Containing over 8,000 "hard-to-spell" technical words from the vocabularies of science and technology.

INTERLINGUA: A Grammar of the International Language—Alexander Gode and Hugh E. Blair—*Storm*, 2nd ed., 118 p., $3.50. Since the first edition was published in 1951, numerous journals have adopted Interlingua as a secondary editorial language for abstracts and summaries, and several international congresses have found it useful as a substitute for multiple translation in their program.

ISAAC NEWTON—Harry Sootin—*Messner*, 191 p., $2.95. The biography of the 17th century scientist who made many discoveries that are the basis of modern physics and chemistry.

LEOPARD IN MY LAP—Michaela Denis—*Messner*, 254 p., illus., $4.95. An adventure story written by a woman about trips taken with her husband into the most primitive parts of Africa, South America and Central America.

THE MERCK VETERINARY MANUAL: A Reference Handbook of Diagnosis and Therapy for the Veterinarian—*Merck*, 1398 p., $7.50. Emphasizing primarily diagnosis and therapy, but including pathological and epizootiologic features.

THE ORIGIN OF THE EARTH—W. M. Smart—*Penguin*, 224 p., illus., paper, 65 cents. An account of what is known and thought about the origin of the earth and planets, distinguishing accepted theory from speculation and guesswork.

THE PHYSIOLOGY OF DIAPAUSE IN ARTHROPODS—A. D. Lees—*Cambridge University Press*, 151 p., illus., $2.50. Studying the condition of arrested growth typical of many hibernating insects and mites, physiologists have found material for investigating fundamental aspects of growth.

PROBLEMS AND CONTROL OF AIR POLLUTION—Frederick S. Mallette, Ed.—*Reinhold*, 272 p., illus., $7.50. Proceedings of the First International Congress on Air Pollution held in New York City, March, 1955, under the sponsorship of the committee on air-pollution controls of the American Society of Mechanical Engineers.

SCIENCE AND THE COURSE OF HISTORY—Pascual Jordan, translated by Ralph Manheim—*Yale*, 139 p., $2.50. A series of radio talks pointing out the influence scientific research has had on the course of human events.

SCIENCE FOR TODAY AND TOMORROW—Herman and Nina Schneider—*Heath*, 378 p., illus., $2.44. Many phases of general science are covered in this text for the sixth-grade student.

SCIENCE IN OUR WORLD—Herman and Nina Schneider—*Heath*, 346 p., illus., $2.36. Experiments the student can perform make science come alive in this text for fifth graders.

SCIENCE IN YOUR LIFE—Herman and Nina Schneider—*Heath*, 314 p., illus., $2.28. A text introducing fourth-grade students to science.

SOUTHERN AFRICA: A Geographical Study: Volume I, Physical Geography—John H. Wellington—*Cambridge University Press*, 528 p. and maps, illus., $12.50. An attempt to present the more important aspects of physical geography of the subcontinent at the mid-century. Volume II of this series has already been published (see SNL, July 2, p. 12).

SYMPOSIUM ON THE ANTIMETABOLITES: Their Modes of Action and Therapeutic Implications—O. D. Bird and others—*National Vitamin Foundation*, 66 p., illus., paper, $2.00. These substances provide the basis for the modern chemotherapy of infectious diseases.

THE UNITED NATIONS AND THE MAINTENANCE OF INTERNATIONAL PEACE AND SECURITY—Leland M. Goodrich and Anne P. Simons—*Brookings Institute*, 709 p., $6.00. The first volume in a series aimed at an analysis of the issues arising from the experience with the United Nations system, and an evaluation of the implications of the various proposals being made to amend the United Nations charter.

THE URANIUM DEPOSITS OF THE UNITED STATES—Robert W. Schnabel—*U. S. Geological Survey*, Mineral Investigations Resource Appraisals Map MR 2, 1 map, paper, 50 cents. Showing the location of the more important uranium deposits discovered before June, 1955.

WHEN YOU GO TO THE ZOO—Glenn O. Blough and Marjorie H. Campbell—*Whittlesey House*, 128 p., illus., $2.75. Telling what goes on "behind the scenes" at the zoo to help children understand and appreciate the work of the zoo keepers.

WHO FISHES FOR OIL?—Norman Bate—*Scribner's*, 44 p., illus., $2.50. Telling young children in simple language about off-shore drilling for oil.

WORLD ECONOMIC GEOGRAPHY: With an Emphasis on Principles—Earl B. Shaw—*Wiley*, 582 p., illus., $6.50. Exploring physical and man-made factors as they show relationships to making a living.

PUBLIC HEALTH

Wipe Out All TB Germs

Tuberculin test, which detects tuberculosis earlier than any other phase of an examination, even before symptoms are evident, is key to ultimate destruction of every TB germ.

➤ THE BEST CHANCE of ultimately tracking down and destroying the last tuberculosis germ lies in tuberculin testing of school children everywhere, four TB fighters report in the *Journal of the American Medical Association* (Sept. 17).

The four are Drs. J. Arthur Myers of the University of Minnesota, Frederick G. Gunlaugson of the Minneapolis Division of Public Health, Edward A. Meyerding of the Minnesota Tuberculosis and Health Association, and Miss Jean Roberts of the Minneapolis Division of Public Health.

"The tuberculin test," they state, "has become the master key to the tuberculosis problem.

"It detects the presence of tuberculosis earlier than any other phase of an examination."

The tuberculin test is a skin test. A tuberculin reaction means that tuberculosis germs have invaded the person's body and sensitized it to proteins of the TB germ. The person who reacts to tuberculin has been infected by TB germs, even though he may not yet be sick. But he "has tuberculosis as certainly as the one dying from the disease," the Minnesota scientists say.

Microscopic spots of TB damage to tissues develop within an hour after the germs invade the body. These tiny spots of damage progress and may liberate tuberculosis germs that cause new lesions. From the first ones, therefore, more such spots may evolve to cause illness and death.

The tuberculin test can detect tuberculosis during this earliest phase of the disease, while the lesions are still of microscopic size.

This test "now promises to tell the physician the only time to start treatment if complete cure is to be accomplished," the scientists state.

This, they explain, is because during this early stage the damaged tissue spots are still supplied with blood that can carry germ-killing medicines to the germs in them. When the damage has become so great that the tissue spots are dying or dead, the medicines cannot get to the germs to destroy them. It is then too late to cure the disease. All that can be done is to try to arrest its progress.

"If our present or subsequent antimicrobial drugs prove effective in the numerous investigations now being conducted," the scientists say, "it will be the first time in history that physicians have been able to cure tuberculosis."

By tuberculin tests of all school children, doctors will be able to detect the disease at its earliest stage and cure it by treating the reactors. Then they will have to make the test periodically on all non-reactors so that if they become infected they can also be found in time for cure.

Tuberculin tests, the scientists say, bring to light many times more cases than mass X-ray surveys.

The value of tuberculin testing of school children with subsequent tracing of their infection to its source in a case of sickness in the family or school was shown by a study of school children in Minneapolis.

Starting in 1926, tests were given about every 10 years to grade school children in 24 parochial schools. In 1926 almost half the children tested, 47.3%, showed tuberculosis infection. In 1936 the figure had dropped to 18.9%. In 1944 it was 7.7% and in 1954 it was 3.9%.

Science News Letter, October 1, 1955

PHILOLOGY

Navy's Jet Pilots Have Own Chatter Patter

➤ "THE CAT MAN gave a yellow-bar the two-finger windup on the slingshot."

This is not cool chatter between some young hep-cats in a smoke-filled jazz joint, but the deadly serious jargon of the nation's young Navy jet pilots.

The jargon evolved by carrier-based flyboys, who are known in the lingo as jet jockeys, has been set down in *Skyline* (Aug.), magazine of North American Aviation, "to help ordinary civilians dig the patter of these jet-age products."

Possibly losing something in translation, the cat man quotation means that the catapult officer signaled a pilot who is an ensign to run his engine up to rated take-off power preparatory to being launched from a catapult.

"Making a roger pass will be a piece of cake and they'll get a cut from Paddles everytime" lets everyone know that it will soon be easy to make a perfect approach, resulting in an okay sign from the landing signal officer on every attempt.

Other terms and phrases in the Navy jet pilot's glossary include:

air boss—air officer in charge of flight operations

poopy suit—rubberized exposure suit

hot poppa—fire-fighting rescue crewman in an asbestos suit

the groove—an imaginary extension of the centerline of the landing deck

stack wash—smoke and heated air from ship's smokestack

Science News Letter, October 1, 1955

NATURAL RESOURCES

Scots Probing for Huge Off-Shore Coal Field

➤ AN OFF-SHORE COAL PROJECT that could rival our own off-shore oil boom is under way in Scotland. Engineers there are probing the sea bottom for what they believe might be the largest remaining virgin coal field in the United Kingdom.

A $700,000 steel tower, similar to the sea forts used during World War II, now stands a mile off shore in the Firth of Forth, a large bay in eastern Scotland. Its drills are boring deep into the estuary floor in search of a fabulously rich coal field that is believed to stretch across the inlet.

Geologists agree there is coal down there, but how much is still in doubt. British government experts suspect the reserve is as great as 6,000,000,000 tons, a 6,000-year output for the largest Scottish mine. The United States, which is the largest coal-producing nation, produces about 400,000,000 tons a year.

The bore hole is now being drilled into the bay's floor about a mile off shore, and in 70 feet of water it will be about 2,000 feet deep. A second underwater hole will be bored nearly three miles from the coast, it is reported in *Mining Engineering* (Aug.), journal of the American Institute of Mining and Metallurgical Engineers.

The British National Coal Board is footing the bill for the project to determine where the richest coal deposits are in the bay. Shafts from mines on the shore, some of which are already reaching under the bay's floor, could then be directed toward the richest veins. The coal could be mined from the water's surface or by long underground shafts from the land. The coal-mining industry is nationalized in Great Britain.

No off-shore coal mining is being done in the United States, but Chile, Canada and Japan are profitably tapping coal deposits miles out to sea.

Science News Letter, October 1, 1955

BIOLOGY

NATURE RAMBLINGS

by Horace Loftin

Arctic Cattle

➤ AN AIR FORCE plane recently flew from Manitoba, Canada, to Richmond, Vt., with one of the strangest cargoes the Air Force has ever been called on to carry.

The plane brought four musk ox calves, taken from their huge, shaggy mothers in the bleak Arctic barrens of the Northwest Territory.

These calves were added to three others brought to a Vermont farm last year, making a total of seven in this unique herd—the only "domestic" musk oxen in the world.

As a matter of fact, it is still too early to speak about domesticated musk oxen. This tiny herd is merely the first step in an attempt to raise the Arctic beasts in captivity and eventually make them useful producers of meat and wool for the colder regions of the world, where cattle cannot be kept economically.

Musk oxen, *Ovibos moschatus,* belong to a sub-group of animals lying somewhere between bison and sheep, and they show many characteristics of both. They inhabit some of the most solitary, dreariest country on earth, where they have made a stubborn fight for survival. Although they were formerly present in northern Europe, now they are restricted mainly to Arctic areas of North America and Greenland.

Adult musk oxen are about six feet long and stand about three and one-half feet at the shoulder. They are heavily built, with short legs and powerful shoulder muscles. In winter, their long, shaggy coat reaches almost to the ground. The coat has long, coarse outer hairs covering a fine under-wool that protects them from the frigid Arctic winds. The musk oxen "raisers" hope to use the wool commercially.

Earlier attempts to domesticate musk oxen have met with failure. In the 1930's, the U. S. Department of Interior imported some of the animals from Greenland to Alaska, where it hoped to establish them on a commercial basis.

The experiment proved unsuccessful, and the musk oxen were removed to tiny Nunivak Island in the Bering Sea. Even today a small herd remains on the island.

Science News Letter, October 1, 1955

BIOCHEMISTRY

Scientist Needs Tears For Eye Research

➤ SURPLUS TEARS are being sought by Dr. Robert Brunish of the University of California at Los Angeles Medical Center for use in his research.

Dr. Brunish is studying the chemical structure of tears as a possible clue to the elusive eye irritant in smog, and to learn something of other factors involved in shedding tears. The research is being supported by the Estelle Doheney Eye Foundation.

The U.C.L.A. scientist reported little difficulty in obtaining children's tears. They flow profusely for science from his own children and from the children's ward in the U.C.L.A. hospital. But adults do not cry readily for science, so he is short on grown-up tears.

Tears are not just drops of salt water, according to Dr. Brunish. They are a complex solution with a surprisingly high protein content.

Apparently tears shed in pain, sorrow or anger differ from those prompted by peeling an onion, or those caused by smog and other irritants. It is hoped that these differences may be detected and furnish some clue as to the nature of the irritant in smog.

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Questions

ARCHAEOLOGY—With what were dice played in prehistoric times? p. 215

□ □ □

BIOLOGY—What is basis for thinking music tastes may be inherited? p. 214.

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CHEMISTRY—Of what value would a chemical treasury be? p. 216.

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FORESTRY—Where was Smokey the Bear found? p. 218.

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MEDICINE—What enzyme slows the polio paralytic process? p. 215.

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PUBLIC HEALTH—How could all TB germs be wiped out? p. 221.

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PUBLIC SAFETY—How can accidental deaths of hunters be reduced? p. 213.

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SOCIOLOGY—How long have horror comics been in existence? p. 217.

□ □ □

Photographs: Cover, Fremont Davis; p. 211, General Electric Company; p. 213, U. S. Army; p. 214, Owens-Illinois; p. 224, Bakelite Company.

FORESTRY

Suspect Jobless Set Fires

➤ FOREST FIRES have a tendency to crop up in areas of unemployment, a government survey has shown.

Arsonists, such as the one suspected of setting ten potentially dangerous blazes in remote Nevada County, Calif., strike their matches for many different reasons. One of them seems to be the need for a job.

The big California "Rattlesnake Fire" in July, 1953, similar to the recent fires in Klamath and Sequoia National Forests of California, burned 14 young missionary students to death. The blaze later proved to be a "job fire."

The arsonist confessed he was out of work and that this was one way he knew to create a job for himself. After starting the fire, the arsonist applied for a job as cook in the fire fighting camp.

Such job fires were known to exist "without question" on a large scale during the depression, forestry experts pointed out. Now, in relatively good times, job fires seem to be more localized phenomenon in low employment areas of the country.

According to the study, taken informally by forest fire experts in Washington, forest fires gravitate toward such areas more than can be explained by mere chance..

Fire fighting is hard, risky work, but the wages are good. A volunteer fire fighter is paid the average going wage of the community.

The experts found that, in a Tennessee-Kentucky-West Virginia coal mining area two years ago, there was an epidemic of large and minor forest fires when coal orders were few and men were being laid off. The fires were away from the towns and from the coal mines.

Since then, although forest conditions have not changed much, there have been no woodland fires to mention in that section. Perhaps times are getting better or workers have had enough fire fighting to reject being firebugs, the experts speculate.

Some southern states have consistently bad firebug records.

About 90% of the forest fires that charred a total of 8,832,963 square acres of U. S. woodlands last year were man-caused. The percentage of those started maliciously, however, was small.

Science News Letter, October 1, 1955

BIOPHYSICS

Speedy Heart X-Rays

➤ APPARATUS for taking X-ray pictures at an exposure of one-thousandth of a second instead of the usual one-sixtieth was announced at the American Roentgen Ray Society meeting in Chicago.

It is expected to be especially useful in taking X-ray pictures of the heart and its blood vessels.

Blood in the human heart and major arteries moves at velocities faster than 20 to 40 inches a second. This makes the heart valves move rapidly, and even "the most cooperative patient" cannot make his heart stand still for an X-ray picture.

The apparatus for taking the faster exposure X-rays was reported by Dr. Charles T. Dotter of Portland, Ore. He worked with Thomas Rogers, electrical engineer of the Machlett Corporation, in whose laboratories at Springdale, Conn., the apparatus was constructed.

The differences between short exposure and conventional exposure films are striking, Dr. Dotter reported. Detail is far superior and the information derived considerably greater. Previously unrecognized anatomical structures are often shown clearly.

In examination of children and of patients whose illness causes involuntary movement, the new apparatus should be extremely helpful, Dr. Dotter pointed out.

It has an economic advantage also. Dr. Dotter quoted estimates to the effect that as much as $250,000 a year are lost in the United States as a result of undesired movement during X-ray examination. With the new device, Dr. Dotter said it should be possible to make diagnostic studies with far fewer exposures per second, "thus promoting film economy and minimizing radiation hazard."

The apparatus consists of a high tension switching tube, a triode, which can be used with ordinary diagnostic X-ray machine generators and tubes.

Science News Letter, October 1, 1955

The standard average birth weight of a Holstein *calf* is 93.6 pounds.

A man's dry *whiskers* are about as tough as copper wire of the same dimension.

MEDICINE

Radioactive Gold Saves Women Cancer Victims

➤ MORE WOMEN may be saved from cancer death by a prophylactic use of radioactive gold, Dr. H. B. Elkins of the State University of Iowa told the American Roentgen Ray Society meeting in Chicago.

The women to be saved are those whose ovaries are attacked by cancer. At present their survival rate, around 30 out of every 100 patients treated by conventional methods, is "disappointing" when compared to 50% to 80% survival rates for cancer of other childbearing organs.

"What is even more depressing is the low survival rate in early cases," Dr. Elkins said.

The poor results in saving women with ovarian cancers may be due to shedding of cancer cells from the cancer of the ovary. The shed cells would stay in the abdominal cavity after the ovary and its cancer had been removed. They might then grow and spread to kill the patient.

Certain ovarian cancers do shed cells into this cavity in the body, an associate of Dr. Elkins, Dr. William C. Keettel, has shown.

To destroy the cells shed from the main body of the cancer, the Iowa doctors inject radioactive gold after as much as possible of the cancer has been surgically removed.

Since 1951, 66 patients have had this treatment. It "shows promise of increasing the five-year survival," Dr. Elkins said.

Science News Letter, October 1, 1955

New Machines and Gadgets

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE SERVICE, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 798. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

LABEL GRIP for attaching markers to plastics acts as both a permanent and temporary adhesive. Labels put on with it stay on indefinitely or can be peeled off. The plastic adhesive takes the place of pressure-sensitive labels, and can be applied with brush or a labeling machine.

Science News Letter, October 1, 1955

FINGER POWDER for use in handling and sorting money and papers is a chemical preparation resembling gelatin. By simply drawing thumb and forefinger across the material a thin, tacky film remains on the fingers that makes paper sorting easy. The compound, packaged in a four-month supply, eliminates rubber fingers or wet sponges.

Science News Letter, October 1, 1955

LONG-RANGE CARTRIDGES for use against varmints will make hunters and farmers happy. The 244-caliber cartridges with bullet weights of 75 and 90 grains offer a combination of high accuracy and great shocking power. One rifle model has been chambered to take the 244 cartridge.

Science News Letter, October 1, 1955

DISPOSABLE SHOWER CAP is made of thin, flexible and translucent plastic film,

as shown in the photograph. The moisture resistance of the plastic protects hair from shower spray. The lightweight cap slips quickly over the head and stretches to shield most hair lengths. It can also be used as a storage bag for cosmetics.

Science News Letter, October 1, 1955

CHLORINATION OF WATER in swimming pools is made easy by using tablets which dissolve in a plastic basket. The baskets are fastened to the sides of pools at least one foot below the surface of the water. The chlorinating tablets provide a continuous, properly-distributed addition of chlorine to the water.

Science News Letter, October 1, 1955

PICK-UP DEVICE can serve as a butler, lawn cleaner, help to wheelchair patients and retriever. This lightweight mechanical arm and hand consists of a wooden shaft equipped with a pistol grip at one end and a jaw at the other. Measuring 37 inches in length, anything from paper to a can four and one-half inches in diameter can be grabbed with it.

Science News Letter, October 1, 1955

FLAME-CUTTING TOOL that can be used in any sized shop is capable of cutting shapes up to a full 42-inch circle or a 92-inch straight line. It has a permanent magnetized roller that can follow intricate metal templates. The drive shaft, equipped with a worm-gear drive, has no couplings, pulleys or belts.

Science News Letter, October 1, 1955

PERFUMED BABY PANTS, made of a specially-formulated plastic, withstand repeated washings in boiling water and stay soft and flexible. Elastic bindings around waist and leg openings provide a snug fit. Available in medium, large and extra-large sizes, the baby pants come in pink, blue and maize pastel tints, as well as clear.

Science News Letter, October 1, 1955

Do You Know?

Steelworkers are safer on the job than away from it, according to company records on *accident* frequency.

Americans eat more *lettuce* per person than any other vegetable except potatoes.

Mildew, a fungus growth, is insoluble and cannot always be removed from fabrics.

Sounds made by joint *bones*, ordinarily too weak to be heard, are being amplified several thousand times to make possible localization, measurement and permanent recording of bone abnormalties.

More *land* for crops is taken out of production each year by urban and highway expansion than is brought into production by reclamation of arid lands.