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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE • JULY 20, 1946



Anti-Turbulence Screen

See Page 35

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TWENTY-FIFTH ANNIVERSARY

1946



The Victrola*, made exclusively by RCA Victor, gives higher fidelity and longer record life through its jewel-point pickup—

Your Victrola's jewel-point pickup

floats like a feather on water—

Instead of an ordinary, rigidly mounted needle, your Victrola radio-phonograph has a moving sapphire playing tip that fairly floats over the record.

It follows the groove with effortless ease, achieves new clarity of tone, adds longer life to records, and acts as a filter against surface noise.

Such a feather touch reduces "needle chatter," gives you all the rich warm flow of the pure music . . . the highest tones, the lowest tones, the overtones. Truly, your Victrola's jewel-point pickup brings you the ultimate in recorded music pleasure.

This pickup was perfected at RCA Laboratories—a world center of radio and electronic research—where RCA products are kept at the top of the field.

And when you buy an RCA Victor radio, television receiver, Victrola, or even an RCA radio tube replacement, RCA Laboratories is your assurance that you are getting one of the finest products of its kind that science has yet achieved.

Radio Corporation of America, RCA Building, Radio City, New York 20. Listen to The RCA Victor Show, Sundays, 2:00 P. M., Eastern Daylight Time, over the NBC Network.



New Victrola radio-phonograph, with Chippendale-style cabinet, priced at approximately \$275. "Rollout" record changer handling twelve 10-inch, or ten 12-inch records. Permanent jewel-point pickup—no needles. American and foreign radio reception. An outstanding radio-phonograph combination—thanks to research at RCA Laboratories.



RADIO CORPORATION of AMERICA

MEDICINE

Disease Causes Found

The Donovan body, germ causing one type of venereal disease, has been found to cause some cases of arthritis and osteomyelitis.

A NEW CAUSE for some cases of arthritis and the bone disease, osteomyelitis, was reported by Drs. John Lyford III, Robert W. Johnson, Jr., and Roger B. Scott of Johns Hopkins Hospital, Baltimore, at the meeting of the American Medical Association.

The cause is a germ called the Donovan body, Donovan being the name of the man who first discovered this microorganism in patients suffering with a venereal disease, granuloma inguinale. This was then a very rare disease. Only 125 cases were known in the entire United States 25 years ago, but now that many may be seen every week in venereal disease clinics.

The disease, the Johns Hopkins group found, is not limited to the genital and inguinal region where it causes ulcers and buboes but spreads throughout the entire body. Bones, joints, soft tissues and internal organs may be affected. They also found that it may kill its victim, a fact which previously was not known.

The first ulcer may be missed or may be treated and heal and the patient apparently gets over the disease. The Donovan bodies, however, may be carried through the blood to other parts of the body to cause an apparently different sickness and even death years later.

One patient the group saw had symptoms that at first were diagnosed as tuberculosis of the hip. Other patients may have infectious arthritis or osteomyelitis.

Instead of being caused by staphylococci, streptococci or some other germ, the infection in these cases will be due to the Donovan body.

Two ways of detecting the true cause in such cases have been developed. One consists in removing surgically a small piece of joint lining tissue and examining it under the microscope. The other consists in examining the blood serum. Patients with granuloma inguinale will have a normal amount of albumin in their serum but greatly increased amounts of another blood protein, globulin. In no other disease is this albumin-globulin ratio reversed in this way, so far as is known.

While not all cases of arthritis or of osteomyelitis are due to granuloma inguinale, the Hopkins doctors think that in all cases for which no other cause can be found, doctors should look for this disease.

Unfortunately, so far there is no cure for the condition in any of its forms. Sulfa drugs, huge amounts of penicillin, arsenicals and fuadin have all been tried and failed. Hope for development of a cure, however, comes from the fact that Dr. Katherine Anderson of Vanderbilt University has been able to grow the Donovan bodies on chick embryos. This will make it possible to try in the laboratory all kinds of germ killers until one that can kill Donovan's bodies with safety to the patient is found.

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spherical bulge in the tunnel in which are stretched eight fine-mesh wire screens spaced nine inches apart, each one over 60 feet in diameter. The picture on the front cover of this SCIENCE NEWS LETTER shows one of these eight wire screens. These eliminate nearly all the swirling or turbulence in the airstream. This 63-foot spherical bulge and its screens are just ahead of the test section of the tunnel.

Air is circulated through the tunnel by two 18-ton variable pitch co-axial fans which are powered by electric motors of 11,000 total horsepower. By means of large centrifugal compressors, air pressure within the tunnel can be varied from one-sixth to six times atmospheric pressure. The purpose of reducing the pressure below that of the atmosphere is to attain greater speed. Increasing the pressure gives the same result as using larger airplane models.

The tunnel is constructed of welded steel plate and weighs 4,000 tons. Because it is made of steel, it has to be so mounted that it can move with changes and pressure. There is only one fixed point, at the forward end of the test section. The rest of the tunnel floats on 52 pin-ended columns.

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American scientists in Germany are able to find no counterpart of the American produced silicones, sand-based plastics, whose products include fluids, greases, varnishes and resin as well as silicone rubbers.



WIND TUNNEL—This is an aerial view of the new NACA wind tunnel showing the spherical bulge on the right.

AERONAUTICS

New Wind Tunnel

See Front Cover

THE MOST modern aviation wind tunnel in the world, now completed, was dedicated on July 17 at Moffett Field, Calif. It brings to scientists the most accurate means yet achieved for studying the problems of flight up to the speed of sound.

The new unique tunnel is located at the Ames Aeronautical Laboratory of the National Advisory Committee for

Aeronautics. It is described as a low-turbulence pressure wind tunnel with a test chamber 12 feet in diameter. However, by increasing the pressure of the air inside the tunnel to as high as six times atmospheric pressure, data secured on airplane models of 10-foot span are directly applicable to full-sized planes of 60-foot span.

The most distinctive feature of the tunnel is its unparalleled smoothness of airflow. This is accomplished by a large

GENERAL SCIENCE

Science Club No. 10,000

Bloom Radio Club of Chicago Heights High School, Chicago, Ill., is the 10,000th teen-age group to become affiliated with Science Clubs of America.

► THE HONOR of being club number 10,000 affiliated with Science Clubs of America falls to a radio club in the Middle West. It is typical of the teen-age groups that make up this international science organization, the largest in the world.

Club 10,000 has been organized nine years and has 19 members. It is the Bloom Radio Club of Chicago Heights High School, Chicago, Ill.

During its lifetime, 15 boys and one girl have become licensed amateur operators. At least 75 others have done or are now doing some phase of radio or radar work in the armed services.

Service to the school is a keynote of the club. Members installed bells, an electric clock and telephone in the school's agriculture building. The club operates the school's portable public address systems, maintains the movie projectors and other visual education equipment, and cares for the school's transcription players.

The first project of the club was to build and install the centralized sound system that gives the principal instantaneous contact with all 66 classrooms. Working on Saturdays, evenings and holidays, members of the club strung out seven miles of wire and connected 84 loud speakers in this project alone.

One member operates the sound system carrying school announcements and lunch-time music; another, the portable transcription player. Four members make sure the portable amplifier is in top condition for dances, social hours and banquets; in the fall the same unit is employed to carry play-by-play accounts of home football games.

In return for such liberal services, the school furnishes the club with a room and workshop. Here members in their spare time work with the maze of receivers, transmitters, test equipment and other electronic gear. Licensed members constructed and operate the group's own

radio station, W9HFN (radio call W9YB).

The club meets twice a week after school when members are instructed in radio theory. Anything from a crystal detector to a superheterodyne is discussed, diagramed and explained.

Every noon-time is code-time in the clubroom where members practice under the experienced eye of a license-holder. Each tries to reach the goal of a minimum receiving speed of 13 words per minute necessary for a Class B amateur license.

Like all science clubs, each member has a project—in most cases working with his own radio parts. Those who

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CODE PRACTICE—The club members are shown practicing code during the lunch hour in the physics room of the school.

cannot afford to buy their own are loaned one of the club's nine complete kits.

Repair Family Radios

From experimenting with radio parts, the boys soon learn how to repair radios for their families and friends. This free radio repair service is also extended to the teachers.

Members keep the club solvent by selling candy and ice-cream and running various concessions around the school.

Biggest morale booster to the group

was the return of their sponsor, James F. Sears, just back from the Pacific where he was captain in the Marine Corps Reserve. Next year they will have to keep in touch with him by radio as he is going on to college teaching.

Science Clubs of America includes about 250,000 members as energetic and alert as those of club number 10,000. Sponsored by Science Service, clubs specializing in any kind of science activity can join free of charge.

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ECOLOGICAL

Death Within Half Mile

Atomic bomb causes "lethal dose of radiological effects," evaluation report states; Bikini board urges research in interest of national safety.

THE MOST significant point in the Joint Chiefs' evaluation board's preliminary report on the first Bikini blast is that all human beings on ships within a half to three-quarters of a mile of the explosion would have been killed as though they had been exposed to super-gigantic X-ray machine, or worse.

That is the meaning of the expression "a lethal dosage of radiological effects" to which the report says "personnel within the ships would have been exposed." This would have happened on ships so close to the atomic bomb explosion that their superstructure suffered extensive blast damage.

Men aboard an atomically bombed ship, even one that suffered a half-mile miss, would run the risk of two other atomic bomb effects:

1. Flashburn due to initial radiation from the explosion, but men within the hull or shaded from the radiation would not have been immediately affected.

2. Blast of the explosion itself, which "would no doubt have been high for those in exposed positions on vessels within one-half mile."

Add these major dangers to the gamma and perhaps other lethal radiations, and it becomes doubtful if fighting ships so attacked would have sufficient men left in action to take them to a principal naval base for the extensive repairs that the board declares would be necessary.

Naval ships of the future, in addition to having a new kind of superstructure not vulnerable to such terrific explosions, would need to have radiological protec-

tion, which is quite different from armor-plating against shells from 16-inch guns.

While the Bikini board urges in the interest of national safety "further large scale research and development" so that the United States can retain its present position of scientific leadership, the House rules committee heard investigation reports of the House Un-American Activities committee that viewed with alarm the fact that Oak Ridge scientists actually write to people outside the country. Another attempt to support arguments for keeping military control of atomic energy research was the charge that scientific societies within and without Oak Ridge are devoted to the creation of some form of world government.

Supporters of such ideas might view with alarm also the news that the United Nations atomic energy commission is considering establishing a scientific panel for exchanging scientific information on atomic energy.

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MEDICINE

Radioactive Iodine by Mouth Cures Goiter

PATIENTS WITH one type of goiter can "very likely" be cured by swallowing one dose of radioactive iodine ~~at a cost of about \$250~~, instead of having to undergo surgical operation as formerly. Dr. Earle M. Chapman of Massachusetts General Hospital, Boston, reported at the meeting of the American Medical Association in San Francisco.

The goiter is the kind due to overac-

tivity of the thyroid gland and is characterized by bulging eyes, rapid heart action and nervous disability.

Of 46 patients treated with radioactive iodine between May, 1943, and May, 1946, 35 responded to a single dose. Two doses were necessary in three cases and three doses in five cases. In only three cases did mild overactivity of the thyroid continue. No other treatment was given.

The radioactive iodine is a colorless, odorless liquid. That used by Dr. Chapman was produced by the cyclotron at Massachusetts Institute of Technology.

Acute reactions to large doses of the drug resemble X-ray sickness.

An idea of the "extremely large relief and rescue problem" which confronted Japanese air raid defense authorities and surviving members of the medical profession after the atomic bombing of Hiroshima and Nagasaki was emphasized by Dr. George V. LeRoy of Chicago, a member of the joint commission for the investigation of the effects of the atom bomb in Japan.

In Hiroshima, there were 80,000 killed, 40,000 injured and 85,000 in need of immediate medical care. Dr. LeRoy reported. In the Nagasaki bombing 40,000 were killed, 25,000 injured and 50,000 were in need of immediate medical care.

"It does not seem unreasonable," said Dr. LeRoy, "to believe that in the hospitals of the western world where plasma, whole blood and penicillin are available in adequate amounts, a much lower mortality rate could be achieved than was observed in Japan."

Dr. LeRoy offered these "proper objectives" in the treatment of patients who have been exposed to the amount of gamma radiation emitted by an exploding atomic bomb: maintain fluid and acid-base balance, control infectious processes, combat hemorrhagic tendency and correct the anemia.

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PHYSICS

Distribution of Neutrons In Atmosphere Explored

ARMY BOMBERS have carried neutron counting apparatus as high as 45,000 feet above sea level in an exploration of the distribution of neutrons in the atmosphere. A scientific team from the Los Alamos atomic bomb laboratory, consisting of H. M. Agnew, W. C. Bright, and D. K. Froman, used a B-29 airplane in their experiments. Clouds of neutrons were discovered, and investigations are being continued.

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MEDICINE

Cancer of Larynx Cured

X-rays and radium treatment have cured cancer of the larynx which once depended upon surgery. This method also being used on other forms of cancer.

► **CANCER** of the larynx of a type for which the only hope of saving the patient formerly depended on removing the larynx, or voice box, now is being cured, in more and more cases, by X-rays or radium treatment.

Five-year cures in 18 of 47 patients, or 42%, are reported by Dr. Max Cutler, of the Chicago Tumor Institute. Three-year cures were achieved in 43, or 39%, of 118 patients. In his report to the Archives of Otolaryngology, Dr. Cutler points out that, unlike cancer of the breast or thyroid, cancer of the larynx can be considered cured if the patient remains well for three years. Most deaths from uncontrolled cancer of the larynx occur within three years of treatment.

The success in curing this kind of cancer with X-rays or radium results from a new method of using the rays from either source. "Concentration radiotherapy" is Dr. Cutler's name for the new method which is also used for treatment of similar forms of cancer. It is considered one of the most important advances in recent years in cancer treatment.

In using X-rays, a total dose of 6,000 to 6,500 r is given in 18 days to one spot, instead of the older method of giving a total of 6,000 to 7,000 r to two spots

over a period of four to seven weeks. "R" is the unit of measure for X-ray dosage.

The method of concentration radiotherapy is varied somewhat according to the location and early or late stage of the cancer. The object, however, is to give as intense radiation as possible since this seems more effective in curing radio-resistant types of cancer. The technic of treatment with radium at the Chicago Tumor Institute has been developed with the same object of giving as intensive treatment as possible.

For cancers that could be removed surgically without removing the entire larynx, or voice box, modern irradiation treatment gives as good results as surgery, Dr. Cutler reports. In more advanced cancer which would require removal of the entire larynx to save the patient, curability by irradiation is high unless the vocal cords are completely fixed. In that case, removal of the larynx is necessary.

Further improvement in the technic of irradiation and earlier diagnosis, Dr. Cutler believes, will further lessen the necessity for surgical removal of the entire larynx.

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AGRICULTURE

Farming Is Hazardous

► **FARMERS**, who are engaged in one of the most hazardous of all occupations, need to learn the facts of how, where, and why accidents happen on the farm, two Mayo Clinic physicians declared in a report to the American Medical Association. The physicians are Drs. H. Herman Young and Ralph K. Ghormley.

"In spite of medical and surgical advances that have been and are being made, one cannot help but be impressed with the almost utter hopelessness of many patients who have been injured while at work on a farm. The best cure still lies in prevention of the accidents."

Some of the facts farmers need to know, as learned from these doctors' experiences in treating injured farmers, are:

1. Falls lead all other causes of accidents and caused five deaths in every 100 accidents. Commonest type of fall is from some piece of farm equipment. Commonest injury is one or more broken bones.

2. Farm machinery comes next in number of accidents caused. In this group, the tractor, the cornpicker, the corn shredder and buzz saw, in that order, causes most accidents.

3. Livestock accounts for the third largest number of accidents. Although the bull is generally said to be the most dangerous animal on the farm, horses accounted for most of the livestock accidents in the Mayo Clinic patients.

Children are often among the accident

victims on farms. They have no more right, the Mayo doctors warned, "to be near or on a piece of operating farm equipment than around a punch press or on a moving locomotive, and yet they are permitted to be there daily."

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ECONOMICS

UNESCO Plans Scientific Priorities for World

► **RESTORATION** of scientific facilities in war-damaged countries will be recommended for priority action by the United Nations Educational, Scientific and Cultural Organization, UNESCO preparatory commission has agreed.

Four other recommendations for priority action were: Mathematical computing laboratories, probably in Asia; assistance to international scientific unions; science cooperation offices in remote regions; and a regional research center for the Amazon area to study tropical problems and resources.

The Brazilian delegate offered the financial help of nine South American countries already supporting the Amazon project.

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PUBLIC HEALTH

Fire Prevention Codes Should Be More Strict

► **CERTAIN CHEMICALS**, explosive dry-cleaning fluids, paints and motion picture films are included in a list of hazardous materials used in city industries given at the meeting of the National Fire Protection Association by Percy Bugbee, its general manager.

No business handling materials that are fire hazards, he asserted, should be permitted to operate in a city unless it operates under the provisions of a city fire prevention code which embodies essentials found necessary by national experience.

The codes, he said, should cover occupancies and processes such as explosives, inflammable liquids, paints, varnishes and lacquers, compressed gases, pyroxylin plastics, motion picture film, X-ray film, fireworks, garages, dry-cleaning establishments, lumber yards, refrigerator equipment, fumigation, matches and hazardous chemicals.

We feel, he continued, that the fire prevention code should include also provision for the maintenance of fire equipment in buildings, maintenance of exit

in buildings, particularly places of public assembly, and control of common fire hazards such as rubbish, bonfires, grass and brush fires, and the like.

Mr. Bugbee urged the establishment of fire prevention bureaus in all cities. The first American municipal bureau of this sort was established in New York City in 1912. All but 14 of the cities of over 100,000 population now have them, and also many smaller cities. Most of these bureaus are official arms of fire de-

partments.

War demands for men, he said, weakened both fire departments and fire prevention bureaus. "The severe and continuing rise of fire losses that we have experienced may well be traced in some part to the lessening of inspection work by fire departments, and if there was ever a time when the fire prevention bureaus in our cities should be strengthened, it is now."

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tor roads which will mask the inherent limitations of the small car in the aspects of hill climbing and acceleration."

"The European car," he added, "must have material and man-hour content not greater than one-third that of American vehicles."

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PUBLIC HEALTH

Birth Card Adopted by Seven States, One City

► BIRTH CARDS that fit easily into a billfold are now being issued by seven states and one city. Much handier than a birth certificate, it is a combination birth registration and identification card.

The type of card varies with the issuing state. Most states use an indestructible, laminated card, thus assuring that facts will not be changed after issuance. Some include a place for the holder's photograph. On some the person's race is listed along with the date and place of birth, on others merely the father's race is given, the Census Bureau states.

Mississippi was the first state to issue birth cards to people whose birth is registered in that state. Now these handy cards are issued by six other states—California, Nevada, Ohio, Oregon, Tennessee and Washington—and one city—New Orleans.

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CHEMISTRY

Remove Perspiration Stain With Ammonia or Vinegar

► PERSPIRATION stains that spoil the fresh look of many summer clothes, can often be removed at home. The method you use will depend largely on how long the stain has been left in the garment.

As body perspiration is usually acid, counteract fresh stains with alkali. Dampen the spot with water and hold for a few minutes over the fumes from a bottle of ammonia water, recommend clothing specialists of the U. S. Department of Agriculture. A few drops of ammonia water diluted to half strength can be applied directly to cottons, linens and other materials that do not spot with water, if rinsed thoroughly.

Use vinegar, a mild acid, for perspiration stains that have been allowed to "set" for a few days. Sponging with vinegar sometimes restores the color, though an old stain, which may have become alkaline, is more difficult to remove than a fresh one.

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AUTOMOTIVE ENGINEERING

Radical Car Changes

► WHILE 1946 would-be drivers are wondering when they will be able to get their hands on a wheel again, automobile designers and engineers are talking about the car of 1950, and the new features planned.

Foreseen are supercharged engines and engines of extremely high compression ratios, and cars with independent wheel suspensions, hydraulic steering and rubber torsion springs. The occasion was the summer meeting of the Society of Automotive Engineers.

Present and prospective motor fuels, according to Earl Bartholomew of the Ethyl Corporation, offer real possibilities for high fuel economy and great power output. Gains potentially are similar, he said, whether superchargers or higher compression ratios are employed. Motor fuel octane numbers and antiknock ratings on the order of 86 premium and 80 regular grade fuels are already available. He stated that short, compact, V-type or opposed engines of 8.5 compression ratio operating on fuels in the 100-octane range appear to be inviting, especially by way of fuel economy, which further could be enhanced by progress in designing automatic transmissions.

A light five-passenger car is equipped with rubber torsion springs, independent wheel suspension and hydraulic steering. It was described by representatives of the B. F. Goodrich Company. The springs consist of rubber cylinders bonded internally to central shafts and externally to outer shells, either of which is held stationary and the other rotated by a wheel support arm.

Front suspension of the car is by single wheel support arms mounted diagonally from the dash on the outer member of cylindrical rubber torsion springs. Rear suspension is of the inde-

pendent swinging axle type, with a universal joint at each wheel.

Steering is accomplished by two balanced hydraulic circuits, one being a hydraulic tie rod between the front wheels, the other a pump circuit, with both kept under minimum positive pressure by a spring-loaded reservoir.

The one-ton car is the top limit in Europe for all but a wealthy few; the Society was told by Laurence Pomeroy, technical editor of a London automotive journal. Increasing attention, he said, is being given to designing a half-ton car.

The reason for this, he said, is because in the United Kingdom the most prosperous country of Europe, 78% of potential buyers must have the utmost in economy, 15% must make close studies of operating costs, and only 7% are able to buy cars on the basis of preference and performance.

As an example of European design trends, Mr. Pomeroy described a new French model, a three-wheel car with aluminum-alloy one-piece body and chassis and a 15-horsepower two-cylinder engine giving speeds of perhaps 50 miles an hour but with fuel mileage as high as 94 miles per gallon. At the other end of the scale, he said, is a German car with a six-cylinder engine giving speeds of 100 miles an hour with fuel mileage from 20 to 30 miles per gallon.

"Economic factors prescribe that normal European cars should not exceed 2,000 pounds all-up weight, and should be capable of at least 30 miles per gallon in day-to-day running," he asserted. "Improved body form will permit such cars to sustain road speeds of 70-80 miles per hour, and this will make the small economy car increasingly competitive with larger types. This competition will be fortified by world developments in mo-

PHOTOGRAPHY

Special Film Used To Record Ultraviolet Rays

► SPECIAL photographic film with a fluorescent coating, developed by the Eastman Kodak Company, was used in a spectrograph in the nose of a giant rocket to record, a hundred or so miles above the earth's surface, ultraviolet rays radiated from the sun.

The rays to be recorded are those that never reach the earth, being unable to penetrate the earth's atmosphere. Also they are unable to penetrate the gelatin emulsion on ordinary films. The fluorescent coating used glows under ultraviolet and this glow leaves a photographic image on the film.

The rocket carrying the film and its holding apparatus were used in the Navy V-2 rocket tests at White Sands, N. Mex., in an attempt to secure new information of value to weather prediction, radio communication, stratosphere flight, and astronomy. Instruments for other purposes will be rocket-borne also.

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PSYCHIATRY

Too Much Security Bad for Children

► PARENTS should be careful not to provide too much security for their children after the early developmental age; rather, they should teach them how to live in an insecure world.

This is the opinion of Dr. Karl M. Bowman, professor of psychiatry in the University of California Medical School.

Dr. Bowman says that since there is no such thing as complete security in the world, an overemphasis on that concept is dangerous. The child should be given a feeling of security in the early developmental stage, but from then on he must be taught how to face the realities of an insecure world.

"We should aim to develop personalities capable of dealing with all situations and able to bear stress and strain, rather than to create a social organization which relieves individuals of all necessity for strength of character and feeling of responsibility," Dr. Bowman says.

"Unfortunately at the present time the idea is growing that the government is responsible for everything, and that we have no responsibility either for

our own condition or for that of our fellowmen. Such a philosophy will inevitably lead to a type of collectivism in which a limited few will dominate the behavior and thinking of the many.

"This trend is neither new nor progressive. Actually it is a regressive tendency: a return to a more primitive and archaic social organization which will inevitably lead to the same injustice, tyranny and suffering which have existed recently in Germany and Italy. In spite of this many persons of the so-called intelligentsia wish to develop this type of organization, and cannot see what the consequences will be."

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ENGINEERING

Lead Alloy Sheathing Improves Telephone Cables

► AN IMPROVED lead alloy has been developed for the familiar flexible tube that stretches from pole to pole enclosing a bunch of telephone wires and, with them, forming a telephone cable. It is an arsenical lead, containing small amounts of tin and bismuth.

The new cable sheathing, to be known as F-3 alloy, is a development of the Anaconda Wire and Cable Company. L. F. Hickernell and C. J. Snyder, of the company, told the American Institute of Electrical Engineers. It has already been installed on some commercial lines, and is suitable for underground installations as well as suspension in the air.

This new material, they said, when suitably hardened by heat treatment also has physical properties which may meet the requirements set for medium-pressure gas-filled cable. The sheathing is characterized by strong, tough welds, outstanding resistance to bending fatigue, excellent creep resistance and bursting strength.

Operating experiences have demonstrated that the attainment of good service of most electric power cables has become substantially more a function of the characteristics of the sheath than of the insulation, they explained.

A satisfactory cable, they stated, must have resistance to slow bending fatigue, resistance to creep, or expansion, at low internal pressures and to bursting due to high internal pressures, resistance to abrasion and corrosion, stability from age-hardening, and resistance to vibration fatigue caused by traffic or swinging in the wind.

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IN SCIENCE

NUTRITION

B Vitamin Necessary For Rat Mothers

► REPRODUCTION IS seriously impaired by a shortage of pantothenic acid, one of the B vitamins, animal experiments at the University of California show.

In recent experiments with rats Dr. Marjorie Nelson, research fellow, and Dr. Herbert M. Evans, director of the Institute of Experimental Biology, showed that female rats on a diet deficient in pantothenic acid always had defective litters, failed to become pregnant, or had the rat equivalent of miscarriage.

These results applied to rats fed on a deficient diet beginning as late as the day of mating with normal male rats. Care was taken that no dietary factor was deficient.

Reproduction has also been found to be impaired by deficiencies of vitamin E, vitamin A, essential fatty acids, low protein intake, riboflavin, an amino acid called tryptophane, and biotin.

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BIOCHEMISTRY

Quick-Drying Liquid Protects Corn Seeds

► A QUICK-DRYING liquid treatment to protect seed corn against disease and decay will become available commercially late this summer, the du Pont Company has announced.

A protective covering with the consistency of buttermilk is coated on the seeds by the new system called the slurry method. The covering is a water suspension of powdered "Arasan" SF fungicide, that has been successfully used on seed corn in powder form. Active ingredient in the disinfectant is tetramethyl thiuram disulfide.

Using the liquid eliminates the need for masks to protect workmen from flying dust in the powder treatment, while the corn dries quickly enough to be sacked directly from the treater.

The mechanical treater controls the flow of the fungicide, and one pound of the powdered "Arasan" in a gallon of water will coat 32 bushels of corn.

Science News Letter, July 20, 1946

THE FIELDS

AGRONOMY

Fifty New Range Grasses Bred in California

➤ A VERITABLE king's banquet of new grasses is being prepared for America's range cattle by University of California College of Agriculture specialists. Fifty new range grasses that will remain green and tender during hot summer months have already been bred with the aid of colchicine by the University's division of agronomy.

In producing the new grasses, hybrids are first created from existing species. Then these hybrids are made fertile by doubling their chromosome number through the use of colchicine.

Dr. R. M. Love, of the division of agronomy, says that the 50 new strains represent at least 20 new species. Tests show they are more vigorous than their parents and stay green better during summer months. They also survive better under dry conditions.

The scientists are now selecting the best of the 50 new grasses for vigor and fertility, and seed is being grown for large scale tests.

Science News Letter, July 20, 1946

MEDICINE

Drug Aids in Treatment Of Aphasia in Veterans

➤ A NEW TREATMENT which promises to bring recovery to many of the nation's war veterans who are disabled by brain injuries has been announced by the Office of the Surgeon General of the Army.

The patients are healthy, physically able-bodied young men but are more or less disabled because they have lost the ability to speak, or to understand what is said to them, or to read or to write. The condition is known as aphasia. It comes, in these cases, from injury to a special area of the brain. A man with this condition may be able to write what he wants to say but not to say it. He may understand what is written but cannot understand the same words when he hears them. Or he may suffer from what the Surgeon General's report terms "weird combinations" of such difficulties.

The treatment which is proving suc-

cessful, Captains Louis Lin and Martin H. Stein report, consists in first giving the patient a dose of the sleeping and relaxing medicine, sodium amytal. Under this drug's influence, emotional barriers are temporarily let down and the veteran gains confidence in himself. He is then able to profit from psychiatric treatment and careful retraining in speaking, writing or understanding words.

The patient's emotional attitude is the greatest barrier to recovery from aphasia, the Army medical officers found. The patients are in a pitiable state, and feel quite hopeless about ever again being able to speak or comprehend speech. The drug gives them respite from this feeling and they can begin to learn. Even if brain areas that originally were used for speech or reading or comprehending speech are destroyed, nearby areas can be trained to take over these functions when treatment is started early.

The retraining sometimes must begin at a kindergarten or even nursery level and requires much time and patience. The outlook, however, for these patients is good in the opinion of the Army medical officers.

Science News Letter, July 20, 1946

ELECTRICITY

Fiber Glass Insulation For Magnet Coils

➤ FIBER GLASS in silicone resin makes satisfactory electrical insulation in magnet coils, it was revealed to the American Institute of Electrical Engineers by Graham Lee Moses, of Westinghouse, and Julius J. Torok of Corning Glass Works.

The insulation of magnet coils presents problems different from those of rotating machines. Messrs. Moses and Torok reported on recent tests made by them to help solve these problems.

"The combination of fiber glass and silicone resin makes an important contribution to improving the thermal life of magnet coil insulation," they said. "The end of the reliable life of such coils is believed to be determined by the failure of the silicone resins as bonds. The glass fibers provide positive turn separation and the by-products of silicone decomposition are non-conducting."

"Silicone insulated magnet coils employing fiber glass insulated wires can be rated at temperatures appreciably above the 160 degrees Centigrade temperature by resistance proposed for silicone insulation on rotating machinery."

Science News Letter, July 20, 1946

INVENTION

Classification System Needed by Patent Office

➤ WANTED: a new system of classification for scientific and technical knowledge, for use in the U. S. Patent Office.

This office frankly states it needs a new system. It is now swamped with the 8,000 applications for patents received monthly, largely because existing systems of classifying technical knowledge are hopelessly inadequate to meet modern needs.

This makes it hard on the technical men of the office who have to search through office files to determine if applications received are for inventions actually new, or if they infringe on patents already granted. It is hard also on scientists and inventors who come to the office and have to grope through masses of material to find what they want.

The American patent system is now 110 years old and has granted over 2,400,000 patents. In early days inventions were for relatively simple devices. Now they involve almost every known field of science. Some are particularly hard to classify such as those that involve electronics or the newer fields in chemistry, and they defy satisfactory classification by any known system.

The Patent Office, established for inventors and staffed by technical experts who know inventions, now wants some inventor to come forward with a new classification system.

Science News Letter, July 20, 1946

ENGINEERING

Brake Control For Automobiles

➤ AN INVENTION, relating to brakes for motor vehicles of the fluid type, provides a way by which the brakes are controlled from the starter motor and the steering wheel. A cam on the shaft of the starter motor works a piston rod for forcing fluid from a cylinder to the brakes.

A mercury switch on the steering wheel, within easy reach of the driver, is used to close a circuit to the starter motor when a braking operation is desired. The frictionally held cam will move only a limited distance before slipping, thus preventing the brakes from becoming set.

Thomas A. Martin, Jamaica, N. Y., received patent 2,403,870 for this device.

Science News Letter, July 20, 1946

ANTHROPOLOGY

A World of Masks

False faces have been used in all lands and throughout all ages. To primitive peoples they represent evil spirits, while modern masks mostly protect.

By MARTHA G. MORROW

► WE LIVE in a world of masks and most of them are not in the museum.

The conventionally pretty girl who "ohs" and "ahs" over the grotesque medicine man's mask in the show case is herself wearing a modern false face.

Her rouge, lipstick and eye shadow conceal her face and make her conform to our idealized conception of human beauty. Dr. Margaret Mead, American Museum of Natural History anthropologist, helps us see through such modern girl deceptions, which do not differ fundamentally from strange and scientifically collected false faces that attract museum crowds:

Masks with grotesquely distorted features. False faces four or five feet high. Head ornaments with towering horns

and huge flapping ears. Palm-leaf head-dresses that cover the face. Double and triple masks with hidden strings to open the outer face and show another within.

Masks such as these puzzled and intrigued GI's who, fighting in far-flung lands, stumbled upon native ceremonials or discovered them hanging unused in tiny villages.

Then there is the bandit's handkerchief of blood and thunder wild west stories. Surplus gas masks are sold as Christmas toys. Skilled surgeons operate behind spotless face coverings. Welders seek the safety of helmets in rushing ships to completion.

Today's Masks Protect

Today masks are used primarily to protect the wearer against flying sparks or possible infection. Physical protection,

however, is one of the least important qualities of the magical false-face. As in pagan lands, occasionally masks dramatize the hopes and fears of our own children. Santa Claus with his rosy cheeks and long white beard still promises gifts. Witches and ghosts even today stalk the byways at Hallowe'en.

Used to disguise or protect, masks are found all over the world. Sometimes they help man imitate some spirit which he fears and hopes to control. Often an animal disguise aids in making an early kill. At other times they are used merely for dramatic effect—to give the actor added height, or make him extremely handsome or grotesque.

In primitive lands masks are still worn for ceremonial dances. Almost all the Negro peoples of Africa use false faces for worship and driving out evil spirits, for secret-society activities, and for festivals. They are made along the equatorial belt from Senegal to the Sudan, Gold Coast, Congo and Tanganyika.

Disguised with a mask, the wearer moves as he feels the mask-spirit would move. If he wears an animal head, he imitates the characteristic movement of the animal. The goat, for instance, wags its beard and leaps. The bull menaces with its horns and charges. These movements, repeated over and over again, give birth to the rythmical dances performed by the wearer, reasons Dr. Paul McPhalin of the Cranbrook Institute of Science, Bloomfield Hills, Mich.

All Types Material Used

Everything from wood, reed, fabric, shells, to fur and metal are used in making masks. Wood, one of the best materials, has been used in all parts of the world. Frequently the mask is hewed from a living tree, to catch the spirit of the tree.

False faces may be small, covering only a portion of the wearer's face. Or they may cover the face and top or all of the head. Tall ones, adding many inches to the wearer's height, are worn like a helmet with the visor down the neck of the mask fitting around the head of the wearer.

Hidden strings in masks found along the Northwest Coast bring the natives of Haida, Tlingit and Salish face-to-face with their spirit ancestors. By pulling the strings to open and close the double



FALSE FACES—At left is a closeup of a grotesque wooden mask, trimmed with horsehair, worn by the Iroquois False Face Society dancer. Such masks are carved on the trunks of living trees. At right is a New Guinea ballet dress of palm leaves and festoons of bright orange gourds with a mask woven of fiber and a long nose, representing the Sepik natives' idea of beauty. These masks are now on exhibit at the American Museum of Natural History.

and triple masks, dancers portray their animal ancestors who could change to human form and back again.

The Eskimo hopes to attain power over the natural world by wearing a spirit mask. They have the shape of a human face, but one or more features are distorted to resemble a bird, fox, wolf or seal. Feathers and fur attached to the edge of the masks move back and forth with the motion of the dancer.

A surprise awaits those who see masks from Guatemala for the first time. Instead of representing natives of Central America, they portray blond Spaniards with their blue eyes, pink cheeks and curly hair. These are used in pageants depicting the Conquest of Mexico, and battles between Moors and Christians.

Beautifully carved masks made by the Ibos of the Niger river include a long, straight nose, thin lips and small teeth. Remarkably Egyptian in character, these are the Maw masks, painted in white to represent the primitive conception of the resurrection in reembodyed spirits.

Peace with spirits of the other world is the chief aim of the masked dancers in Borneo. Of weird design and elaborately carved, they are worn to insure

good harvest by capturing the timid Rice Soul at planting time.

Iroquois Dances

False faces are worn right here in the United States, not only by the Hopis and Papagos of the Southwest, but also by Iroquois in New York state. Dancers of the Onondaga tribe suddenly appear outside the council house wearing grotesquely twisted faces. Pounding with their clubs and shaking their turtle-shell rattles, they rush into the house. Creeping and crawling on all fours, they shake their rattles along the floor. The Iroquois False Face Society dance is performed today, as it was when white men first appeared on these shores, to appease the devils and drive out the witches who bring disease and misfortune.

Recalling legends and superstitions of long ago, masks such as these are being exhibited at the American Museum of Natural History throughout the summer. Iroquois husk faces that look like door mats with holes for eyes and mouth are displayed along with gaudily colored Devil-dancing masks from Ceylon. As unrelated as they may seem, they were all used to mystify the audience.

Science News Letter, July 20, 1946



TODAY'S MASK—Most of the masks of today, at least those of civilized people, are used for protection. The man in the picture is welding iron beams on a construction job. The mask is his protection against flying sparks.

pressed over the bleeding point it sticks there until fibrin is liberated from the blood to hold the sponge clot in place. Like the oxidized cellulose gauze, this gelatin sponge can be left in the body and finally will be absorbed after bleeding has stopped. This development was reported by Drs. Hilger Perry Jenkins, Rudolph Janda, James Clarke, Edward H. Senz and Howard W. Owen of the University of Chicago department of surgery.

The gelatin sponge has formed a reinforced clot firm enough to stop bleeding from wounds of the heart, but Dr. Jenkins believes it is only a first step toward better aids for controlling bleeding. It is not a substitute for stitching a cut blood vessel nor for tying it to prevent bleeding, but is for use when these methods would fail.

Safer operations with less blood loss and possible development of operations that cannot be performed today because of the danger of hemorrhage are foreseen by Dr. Jenkins as a result of future developments of the gelatin sponge or the oxidized gauze.

Both are so new that neither Dr. Jenkins nor Dr. Frantz can say in what conditions one might prove better than the other. Both doctors are equally enthusiastic about both developments.

Science News Letter, July 20, 1946

MEDICINE

Hemorrhage Preventives

Tubes of fibrin from blood will save children threatened by hemorrhage; new types of gauze and sponges avert bleeding in operations.

► TUBES MADE of fibrin from blood are expected to help doctors save children threatened by death from hemorrhage due to cirrhosis of the liver, it was revealed at the meeting of the American Medical Association in San Francisco. In such cases, doctors try to overcome the danger of bleeding to death by operations to shunt the blood circulation from one vein to another. The fibrin tubes are expected to help by holding the cut ends of the blood vessels together without the need for stitches which may cause blood clots. Experimental work which has convinced the investigators the tubes are ready for use was reported by Dr. Orvar Swenson of Children's Hospital, Boston.

Danger of fatal hemorrhage in operations or accidental injuries may be averted by two kinds of sponges shown at the exhibits. One of these is made from oxidized cellulose. Dr. Virginia Kneeland Frantz, of Columbia University, dropped

a bit of the gauze into a glass containing soda bicarbonate solution having the same alkalinity as the blood.

The gauze, unlike ordinary surgical gauze, immediately started dissolving, showing how it can safely be left in the body eventually to be absorbed.

Next Dr. Frantz dipped the oxidized gauze and ordinary gauze into blood. The oxidized gauze at once became a sticky, thick mass that would stop further bleeding, while the ordinary gauze became a soggy mass as it soaked up blood. When used on open wounds where the surgeon fears infection, the oxidized gauze can be removed without starting fresh bleeding because it gets jelly-like and comes off without trouble.

The other anti-hemorrhage aid to surgeons and first aiders is a gelatin sponge. When blood enters the sponge a reinforced blood clot is formed. If it is

Do You Know?

Live timber is seldom static; it is either growing in size or declining in net usable volume.

Roses need fertilizer only once in a year, but they need plenty of water during the hot days of late summer.

Welding is increasingly replacing rivet joints in the construction of all classes of metal railroad cars.

Fungi have long been used by man for useful purposes such as in yeast to bring bread and ferment wine, and molds to give flavor to cheese.

About 31,000 miles of mainline railroad tracks now have rails weighing 130 pounds per yard; the heaviest rails used 50 years ago weighed 80 pounds per yard.

British scientists report that by a suitable treatment of common seaweeds *Gigartina stellata* and *Chondrus crispus*, known collectively as Irish moss, an agar can be produced similar to the true agars formerly obtained from Japan.

The shy wood ibis of the southern coast of the United States, a distant relative of the European stork, is the only member of the stork family in this country.

YOUR

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AND ITS CARE

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ASTRONOMY

Brilliant October Meteors

The Giacobini-Zinner comet, recently rediscovered, is expected to provide meteoric fireworks in October when the earth nears its path.

➤ THOUSANDS UPON thousands of "shooting stars" will flash on an October morning this fall, bringing one of the world's most brilliant meteoric showers, if present expectations of astronomers are fulfilled.

The earth plowing through debris from a comet will be the cause of this expected meteor shower scheduled for the early morning hours of October 9.

The earth comes within 135,000 miles of the path of Giacobini-Zinner comet at that time. The earth arrives that close to the comet's path at a point where the comet passed by only eight days earlier.

In 1933 one of the most remarkable of meteor showers startled the world. It made first page news when reported from Europe. Each minute for many hours as many as 400 meteors a minute were actually counted. This brilliant and historic display was caused by the same comet, now rediscovered. But in 1933 the earth was about 500,000 miles from the comet's orbit, over three times as distant as the 1946 prediction, and the comet had preceded the earth by 80 days, not eight days. For this reason, the 1946 display may be even more remarkable than the 1933 Giacobini shower.

The Giacobini-Zinner comet was rediscovered on May 29 by Dr. Hamilton M. Jeffers of Lick Observatory, Calif., and this sets the astronomical stage for the possibility of "fireworks" next fall. The comet itself is quite remarkable to view now or later. At present it is far too faint to be seen with the unaided eyes or even through binoculars.

Discovered in 1900 and having a period of a little over six years, it is only when the comet returns to the vicinity of the earth so that its path comes close to the earth, as in 1933 and this year, that it has the chance to cause a spectacular meteor shower.

Astronomers are reluctant to make too positive predictions. Dr. Fred L. Whipple of Harvard Observatory, a world authority on meteors, cautions: "No certain predictions can be made concerning the magnitude of any meteor shower." He recalls the vast expectations built up

that there would be a great shower of Leonid meteors in 1899, whereas this event disappointed both astronomers and the public. But Dr. Whipple does feel that next October "the circumstances are extremely favorable."

Science News Letter, July 20, 1946

NARCOTICS

Strong Warning Issued Against Use of Demerol

➤ A STRONG warning against Demerol, pain-killing drug recently hailed in a popular article as "God's Own Medicine," is issued by Federal Commissioner of Narcotics H. J. Anslinger in the *Journal of the American Medical Association*, (July 13).

Demerol has addiction, or habit-forming, properties similar to morphine, in spite of popular reports to the contrary, Mr. Anslinger states.

"I cannot too strongly warn the members of your Association about the danger of addiction to Demerol," he declares.

Demerol's addiction properties were shown in studies by Dr. C. K. Himmelsbach of the U. S. Public Health Service at the Federal health service's hospital at Lexington, Ky. In addition, Mr. Anslinger points out, Drs. Hans H. Hecht, Paul H. Noth and F. F. Yonkman, of Detroit, also warned of the danger of Demerol addiction.

"Demerol was placed under federal narcotic control by the Congress because of evidence given before that body of dangerous properties," Mr. Anslinger says.

Numerous cases of addiction involving the use of Demerol are in the files of the Bureau of Narcotics, and Mr. Anslinger fears "a wave of Demerol addiction" if physicians believe what he considers "reckless and dangerous statements" recently made.

Demerol was discovered in Germany and made its appearance in Argentina several years ago. Both countries immediately placed it under strict control.

Science News Letter, July 20, 1946

There is no ready way to distinguish between edible and other mushrooms.



Unjustly Accused

➤ **GOLDENROD** is in bloom again, and sneezes ring from noses tormented with irritating pollen. So thousands of sufferers see cause where there is only coincidence, and the goldenrod gets the blame.

What actually happens is that the two commonest species of ragweed come into bloom at just about the same time as goldenrod. Their flowers are green and inconspicuous, though they shed thousands of times more pollen than does goldenrod. Hay-fever sufferers, glaring about with red and watery eyes, ignore the camouflaged trouble-causers and fix upon the masses of bright blossoms. Goldenrod pays an unfair price for its

conspicuous beauty.

But, some will argue, a bunch of goldenrod was brought into the house yesterday, and I started sneezing almost immediately. True enough. The sneezes could have come from one of three causes. They could have been purely psychological: we have a tendency to do the thing we are afraid will happen. The goldenrod's own pollen might possibly be responsible: allergists say that a very few persons do react to goldenrod, though they are counted as single individuals to the thousands who are sensitive to ragweed. Likeliest way for goldenrod to cause sneezes is as a passive carrier for ragweed pollen, that has settled like dust on its flower-heads and leaves, and gets shaken off again when the stalks are picked and carried away.

Best thing to do, if you think goldenrod makes you sneeze, is go to an allergist and get yourself tested with all the pollen extracts in his armory. That will settle the question of guilt or innocence with reasonable conclusiveness.

The chances are always against goldenrod's being responsible. Its pollen appears to be inherently less likely to cause an allergy than is the pollen of the ragweeds. Not only that; it is far less likely to be adrift in the air, for it is the large-grained, heavy, sticky kind of pollen that is adapted for insect carriage, as contrasted to the light, dry, powdery pollen of the ragweeds, which is adapted for floating on the lightest hint of a breeze.

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1. The biting dog should be immediately taken to a veterinarian or the local health department so that he can be put under observation to learn whether he has rabies; 2. The person who was bitten should see a doctor at once. If the bite victim was another dog, this animal should also be taken to the veterinarian for confinement and observation so that he cannot spread the disease if he has caught it.

Science News Letter, July 20, 1946

AGRICULTURE

Making Hay While The Sun Isn't Shining

➤ **MAKING HAY** while the sun doesn't shine seems to be the motto of a Pennsylvania farmer whose hay curing process has been reported to the American Society of Agricultural Engineers by R. C. Miller of Ohio State University.

The farmer, Herbert Muffley, near Easton, Pa., used a large fan, an automobile engine and an improvised wind tunnel to dry hay in his barn after having baled it in the field. With this makeshift equipment he made hay that sold for \$60 per ton as opposed to \$45 a ton for his best field-cured hay.

Barn curing with a small power unit is generally used for loose, long hay but Mr. Muffley increased his returns by using 28 to 48 horsepower from an automobile engine in an old-fashioned overhanging Dutch barn with a lean-to shed.

Science News Letter, July 20, 1946

PUBLIC HEALTH

Vaccinate Against Rabies

➤ **NOW THAT** the "dog days" are here, they may spur communities to intensify the fight against rabies. Traditionally, this is the season when the disease is more prevalent in dogs and humans. U. S. Department of Agriculture scientists explain this may be because people and animals move about more freely. Actually, the hot weather does not have any effect on the disease itself and the term "dog days" is said by these scientists to be just one of several myths associated with rabies.

The word "hydrophobia," sometimes used as a name for the disease, is another myth, the Agriculture scientists point out. The word means fear of water, but rabid, or mad, dogs do not show any such fear. Even foaming at the mouth is not a reliable sign of the disease.

The first sign of rabies in a dog is a change in his disposition. He seems to lose his normal desire to recognize and be friendly with other dogs and people. Dogs which have previously been somewhat aloof may, on the other hand, become unusually affectionate, friendly and gentle. The vicious, aimless snapping and crazy running about come later.

Vaccination of dogs to protect them against this disease is advised by the U. S. Bureau of Animal Industry. Other measures to prevent spread of the disease are prompt segregation of any dog suspected of being rabid, prompt examination of the brain of any suspect dog, quarantines and impounding all strays.

When a rabid dog or one suspected of having rabies bites a person or another dog, two things should be done at once:



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PHYSICS

Speeding Up the Proton

► SCIENTISTS IN the front lines of physical exploration of atomic particles are excited about a new kind of high voltage machine that promises to speed along the hearts of atoms at accelerations of several hundred million or even billions of volts, comparable to or exceeding the cosmic rays from outer space.

The linear accelerator, as it is called, was tested about for the first time at the Berkeley, Calif., meeting of the American Physical Society by Prof. Luis W. Alvarez of the University of California.

Using the resonating cavities from second-hand radar sets left over from the war, it is understood that an accelerator about 40 feet long that will operate at about five million volts direct current is being built and should have its first trials next fall. It would be used to accelerate hydrogen atom hearts, protons, useful in all sorts of atomic or nuclear research such as produced the atomic bomb.

Eventually the resonating units, each giving a kick to the particles, might be strung out for a mile or more in a

straight line. This would give accelerations equivalent to hundreds of millions or even billions of volts, if all goes well.

Work on the linear accelerator "atom-smasher" was begun when it appeared that the cyclotron had reached a limit in its voltage at about fifty million. This was before a frequency modulation scheme was used a few months ago with the cyclotron that now makes it possible to operate it at several hundred million volts. A new giant 184-inch cyclotron is being built at the University of California, under Nobelist Ernest O. Lawrence.

Another atom-smasher, the synchrotron which has unusual qualities all its own, is being developed by Prof. Edwin M. McMillan. It will develop 300 million electron volts. With the giant cyclotron it makes a pair of the most powerful instruments for atomic bombardment in the world.

With this new array of atomic artillery many new discoveries about the constitution of matter and the action of atomic particles may be expected in forthcoming months.

Science News Letter, July 20, 1946

ENGINEERING

New Vacuum Tube Amplifier Speeds Messages

► A HUNDRED million words a minute by telegraph, 10,000 cross-country telephone conversations at the same time, dozens of simultaneous television programs—these are the predicted possibilities of a new vacuum tube amplifier.

It is a product of the Bell Telephone Laboratories and will be known as the traveling wave tube. It is entirely different in appearance from previous type amplifiers. It has a stem over a foot long, and a cylindrical bulb at one end.

Inside the stem, running from one end to the other, is a coil of thin wire. The wave to be amplified is fed onto the coil at the bulb end through a wave-guide and is drawn off at the other end in the same way.

While the waves travel down the coiled wire, a beam of electrons is shot through the inside of the coil traveling faster than the wave. These electrons tend to slow down and give up some of their energy to the wave. As a result the wave gains a tremendous amount of

energy and becomes amplified many times.

The idea underlying the tube was proposed and was worked on during the war by a British scientist, R. Kompfner of Oxford University's Clarendon Laboratories. Dr. John R. Pierce of the Bell Telephone Laboratories, with Dr. L. M. Field, solved the electronic problems of the new tube and overcame effects which rendered earlier efforts of little practical value. F. H. Best handled mechanical design and construction problems.

Science News Letter, July 20, 1946

MEDICINE

Dengue Fever Differs From Colorado Tick Fever

► DENGUE FEVER and Colorado tick fever, which are strikingly similar in their effect on human victims, are separate diseases, it is revealed in experiments at the University of California Medical School.

In tests with human subjects, it was found that the contraction of one of the diseases does not give immunity to the other. Therefore, it is concluded that they are separate diseases.

The similarity of the two diseases was brought to light during the war, when American fighting men in the Pacific were plagued with dengue, which has almost the same symptoms as tick fever already known to American doctors.

The research was done by Dr. W. McD. Hammon, associate professor of epidemiology in the Hooper Foundation, and Dr. Lloyd Florio, of the University of Colorado Medical School.

Science News Letter, July 20, 1946

ORNITHOLOGY

Laysan Island Rail Now Extinct

► ADD TO THE war's casualty lists a species of small wading birds that has gone the way of the famous but long-departed dodo.

Wartime conditions rather than actual gunfire wiped out a species of rail, found only on Laysan and Midway Islands in the Pacific, Dr. Dillon Ripley of the Peabody Museum of Natural History has announced.

Rats, spreading rapidly due to war conditions, killed off the last of this species of the smallest stilt-legged wading birds that are related to snipes and sandpipers, Dr. Ripley reported.

Science News Letter, July 20, 1946



100,000,000 WORDS A MINUTE—
This new and simple vacuum tube amplifier developed by Dr. John R. Pierce of Bell Telephone Laboratories (holding the tube) may have far-reaching significance in long-distance telephone and telegraph transmission.

Books of the Week

DESCRIPTIONS OF TWO NEW LEAFBIRDS FROM SIAM—H. G. Deignan—*Smithsonian Institution*, 3 p., paper, 5 cents. Smithsonian Miscellaneous Collections, Vol. 106, No. 12.

ECONOMIC RESEARCH AND THE KEYNESIAN THINKING OF OUR TIMES—Arthur F. Burns—*National Bureau of Economic Research*, 69 p., tables, paper, free. The 26th annual report of the National Bureau of Economic Research, Inc., including an account of activities in 1945 and some plans for the future.

ECONOMIC STAGNATION OR PROGRESS—Ernst W. Swanson and Emerson P. Schmidt—*McGraw*, 212 p., \$2.50. A critique of the Keynes-Hansen school of economic stabilization.

THE ENDEAVOR OF JEAN FERNEL: With a List of the Editions of his Writings—Sir Charles Sherrington—*Cambridge Univ. Press*, 223 p., illus., \$3.50. A study of the life, personality, and work of Fernel who was a sixteenth century French physician.

EXPERIMENTAL HYPERTENSION—Roy Waldo Miner, Ed.—*N. Y. Acad. of Sciences*, 179 p., tables and diags., \$3.75. A series of papers on arterial hypertension, the results of a conference held by the Section of Biology of the N. Y. Acad. of Sciences Feb. 9 and 10, 1945, in New York City. Special Publications of the N. Y. Acad. of Sciences, Vol. III.

FORECASTING COLLEGE ACHIEVEMENT: A Survey of Aptitude Tests for Higher Education, Part I—Albert B. Crawford and Paul S. Burnham—*Yale Univ. Press*, 291 p., tables and diags., \$3.75. The first of a three volume series representing a comprehensive statement of general principles in measurement and guidance at the college-preparatory and freshman levels.

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Cochran—*Smithsonian Institution*, tables, 8 p., paper, 5 cents. Smithsonian Miscellaneous Collections, Vol. 106, No. 4.

PHYSICS—Walter G. Whitman and A. P. Peck—*American Book Co.*, 629 p., illus., \$3. A textbook for use in the high schools, emphasizing practical applications of physics and providing the foundation for an extremely flexible course.

PHYSICS AND EXPERIENCE—Bertrand Russell—*Cambridge Univ. Press*, 26 p., paper, 50 cents. The Henry Sidgwick lecture delivered at Newnham College, Cambridge, 10 Nov., 1945. An examination of the problem of knowledge in the physical sciences.

PIEZOELECTRICITY: An Introduction to the Theory and Applications of Electromechanical Phenomena in Crystals—Walter Guyton Cady—*McGraw*, 806 p., tables and diags., \$9. International Series in Pure and Applied Physics.

PROTECTIVE AND DECORATIVE COATINGS: Vol. 5—Joseph J. Mattiello, Ed.—*Wiley*, 662 p., tables and illus., \$7. Analysis and testing methods, including analysis of resins and drying oils, testing of metal finishes, spectral characteristics of pigments and resinography.

REVIEW OF THE NEW WORLD SPECIES OF HIPPODAMIA DEJEAN (COLEOPTERA: COCCINELLIDAE)—Edward A. Chapin—*Smithsonian Institution*, 60 p., diags., paper, 35 cents. Smithsonian Miscellaneous Collections, Vol. 106, No. 11.

THE VETERAN AND HIGHER EDUCATION: A Report to the President by the Director of War Mobilization and Reconversion—*Government Printing Office*, 39 p., tables, paper, 10 cents. An examination of the problems involved in the rapid expansion of our education facilities to permit the accommodation of those veterans and other students who will wish to go to school next fall.

WATER TREATMENT AND PURIFICATION—William J. Ryan—*McGraw*, 270 p., tables and illus., \$2.75, 2nd ed. Description of the design and operation of sedimentation tanks, coagulation basins, chemical feeding devices, filtration plants, softening apparatus, etc. This second edition includes latest methods for preventing boiler embrittlement, equipment for speeding up the lime-soda softening process, etc.

WOMEN IN INDUSTRY: Their Health and Efficiency—Anna M. Baetjer—*Saunders*, 344 p., tables, \$4. An attempt to make available valuable information for the proper placement of women in industry and to present facts about the relationship of employment to the health of women.

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