

ELECTRONICS

"Scanner" Peers Through Steel in New Invention

➤ ELECTRON streams or gamma rays are used in the apparatus on which patent 2,370,163 was granted to Donald G. C. Hare of Roslyn, N. Y. It is intended to replace costly, high-powered X-ray tubes and slow-operating radium photography, now used in searching thick steel plates for hidden flaws.

Essentially, the device is very simple. A source of penetrating radiation is placed on one side of the steel plate, and a detector of such radiations on the other. Rays passing through the plate will have their intensity changed by blow-holes or other defects in the metal, and the changes will be recorded by means of appropriate amplification and electrical or photographic apparatus. The ray source and its faithful recording companion are moved back and forth, either on the opposite ends of a U-shaped yoke or on parallel tracks by means of synchronized motors, thus "scanning" every inch of the plate.

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AERONAUTICS-MEDICINE

Flying Ambulances Have Web Straps for Litters

➤ CARGO-CARRYING planes can be rapidly converted into flying ambulances through the installation of web straps from which to suspend litters. The new web strap suspension system takes the place of rigid metal framework that formerly hampered loading operations and presented a definite hazard to medical personnel moving about the plane in flight. Straps are more economical in weight and space.

Originally designed for use on the C-82 Packet cargo plane by Michael Cozzoli, project engineer of the Fairchild Engine and Airplane Corporation in cooperation with the Air Technical Service Command, Wright Field, the new method of litter suspension is now standard equipment in all large military ambulance planes, including the C-46 Commando, C-47 Skytrain and C-54 Sky-master.

Using the strap method, 34 litters can be set up in the C-82. Each tier of litters is suspended from the ceiling and hooked to fittings in the floor. Loops in the web straps at regular intervals accommodate the litter handles. A clamp attachment tightens the loop around each handle.

All litters are held in place against the

walls by brackets which are the same distance from the floor as the corresponding loops in the straps. The installation is permanent equipment with the airplane. When not in use the straps can be unhooked from the floor and rolled up into storage bags which are fastened to the ceiling. The equipment can be set up ready for use in less than two minutes.

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CHEMISTRY

Nylon Suit Protects Airmen in Frigid Waters

➤ AIRMEN dunked in near-freezing arctic waters in sub-zero weather after ditching their planes at sea may owe their lives to a new all-nylon anti-exposure suit that is coated with a substance to make it both water-tight and air-tight. Information regarding the substance itself was not revealed.

The protective cloth of the suit covers everything but the face. It was developed by the Personal Equipment Laboratory at the Air Technical Service Command at Wright Field. Under ordinary conditions an airman's survival in water 15 degrees above zero is a matter of minutes. It is reported to be one of the worst situations that a man can face.

During tests, airmen wearing the suit have spent an hour in water at very low temperatures. By use of thermocouples, scientists observed that at no time was any part of their bodies more than a few degrees below normal. The men themselves reported experiencing no real discomfort from cold.

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ORDNANCE

Tracer Elements Fixed on Separate Wad in Shotgun

➤ BODING ILL only to night-flying geese (or possibly also to night prowlers around chicken-coops) is a shotgun shell equipped with a number of luminous tracer pellets, the invention of Newland Knight of Mobile, Ala., patent 2,368,029. It differs from tracer shotgun ammunition heretofore proposed in having its tracer elements fixed on a separate wad that may be affixed to the front of an ordinary shotgun shell, instead of having them mixed with the main charge. The new method gives the user his choice of using tracer ammunition or not, without having to carry special shells.

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IN SCIEN

BIOCHEMISTRY

Penicillium Notatum Is Good Source of Vitamin D₂

➤ THE SAME MOLD, *Penicillium notatum*, that yields penicillin can be made a good source of rickets-preventing vitamin D₂ by irradiating it with ultraviolet light. Getting double value out of it in this way may help cut the cost of penicillin, it is suggested by three Swedish scientists, Dr. Ragnar Nilsson, Dr. Nils Olsson and Dr. Per Eric Nilsson, all of the Swedish Agricultural College at Uppsala.

The suggestion is made in a newly published memorial volume celebrating the sixtieth birthday of the eminent Swedish physicist, Dr. Thé Svedberg of the University of Uppsala. Copies of the book have just recently been received in this country.

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ASTRONOMY

White Dwarfs May Be Pulsating Stars

➤ WHITE dwarfs may be pulsating stars like the giant Cepheids, Dr. P. L. Bhatnagar of the University of Delhi reports in the British scientific journal, *Nature*. Although the pulsation may be too rapid to be observed directly, it may still exist in these exceptional stars which are of high temperature but still with an average density so great as to be almost incredible—sometimes millions of times that of water. The period of the pulsation would probably be less than ten seconds.

There seems to be no theoretical reason why the rhythmic expansion and contraction of a star, so far observed only in giant and super-giant stars, should not take place in denser stars and even in white dwarfs where the atoms have been stripped of their electrons, Dr. Bhatnagar states.

After a white dwarf has been created by the sudden collapse of a star, it is quite natural that the star should be left pulsating, the Delhi astronomer believes. Even if the physical conditions do not favor maintaining such action of the star, Dr. Bhatnagar estimates, once started the pulsation might last for about 1,000 years before it dies out.

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CE FIELDS

HORTICULTURE

New Lettuce Variety Is Promised for 1946

► A NEW lettuce variety, valuable for summer use because it does not shoot up a flowering stalk and "go to seed" as soon as warm weather comes, is announced by the U. S. Department of Agriculture. Propagation stocks of seed are now being distributed to growers, and it is expected that enough seed for general planting will be available by the spring of 1946.

The new lettuce was developed by Dr. Ross C. Thompson at the Plant Industry Station at Beltsville, Md., a short distance outside of Washington. It has frilled, light green leaves with the very wrinkled surface known to horticulturists as "savoyed."

Gardeners refer to the "going-to-seed" process in lettuce as bolting. Because of its reluctance to do this, the new variety has been named "Slobolt."

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GEOGRAPHY

Australia's Future Meat Supply Is Endangered

► MEAT from Australia, now available in generous quantities to our troops in the wide Pacific war areas, through reverse lend-lease, faces an uncertain future because of declining yields of water from the artesian wells on which the country's entire pastoral industry depends; declares James E. Collier, University of Missouri geographer.

All of interior and western Australia is dry country, with annual rainfall of 20 inches or less. It is therefore incapable of development for high-yield agricultural purposes, and is best adapted for grazing cattle and sheep. Water for the livestock, both on the range and along routes over which the animals are driven to market, is supplied mainly from deep wells.

These artesian wells are failing. For a good many years, water has been taken out of the great underground reservoirs faster than new supplies have been trickling in. Many wells that used to be free-flowing have passed over into the sub-artesian category, requiring pumping.

Total number of artesian wells in Australia was about 8,765 at last counting,

as compared with approximately 2,200 in 1900, but the total present flow of water is estimated at only 340,544,000 gallons a day as compared with 673,752,000 gallons a day at the turn of the century. That is, despite a quadrupling in number of wells, the yield has fallen off to about half what it was 45 years ago.

Some artesian water sources remain untapped, Mr. Collier states, especially in the interior and western basins of Australia. However, the likeliest way to increase available water, in his estimation, is to conserve present supplies. Most of the water is now carried away from the wells in open earthen ditches, and this involves prodigious waste through seepage into the ground and evaporation into the always-thirsty desert air. Water-conserving installations may be expected to cost money, but with water constantly growing scarcer and more valuable the expenditures begin to appear economically justifiable.

Mr. Collier's facts and conclusions are presented in a report to the *Scientific Monthly*. (Feb.)

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CHEMISTRY

Simple Chemical Test Determines Butter Quality

► A SIMPLE chemical test has been developed to determine the quality of butter, to replace the ordinarily used method that depends on the human senses of taste and smell. A chemically pure fat solvent, saturated with a neutral red color, is used. Melted butter put in it brings out the red; the more rancid the butter, the stronger the color. The development is the result of work at the Cornell University Agricultural Experiment Station.

The chemical used is pure xylo. In the test, one cubic centimeter of milk-fat is melted in the xylo, which has been saturated with the neutral red color, and the resulting product compared with the different shades of red in a standards series. These standards contain known quantities of oleic acid, one of the acids commonly measured in butter. A strong red color after the processing indicates a strong rancid butter. The lighter the shade of red, the less the rancidity.

The new method may be used by creameries and butter dealers with only the simplest training. It may possibly be usable also in grading cream. It was discovered in 1942 by Prof. George Knaysi, bacteriologist, while working on types of fats in the cells of bacteria, and later applied successfully to butter by him.

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SOCIOLOGY

Expectation of Life Is Index to Social Progress

► THE LENGTH of life to be expected by a newborn baby, which has increased from 41 years in 1840 to about 62 years in 1930, has kept pace with scientific advancement during those years and is an index of social progress, Dr. Hornell Hart and Hilda Hertz of Duke University report in the *American Sociological Review*.

"High expectation rates," they say, "reflect good working conditions, long life, relative freedom from bereavement, health, high scales of living, efficient government, and effective education. Low expectation rates reflect early death, widespread bereavement, prevalence of disease, poverty, filth, vermin, political corruption or inefficiency, and ignorance."

The expectation of life in cities has increased much more sharply than life expectation in rural regions, it is pointed out. The progress has been going on for the past 400 years. Expectation of life has increased as much since 1800 as it did during the entire preceding 50,000 years, the scientists conclude.

Although present trends would indicate that no infant in the future could rely on living to more than from 70 to 75 years, they believe, there is no reason, they feel, why new discoveries such as a cure for cancer or the reasons for aging should not bring new and even more sweeping upsurges in life expectancy.

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ENGINEERING

Lamme Medal Awarded Soren H. Mortensen

► THE LAMME medal of the American Institute of Electrical Engineers has been awarded to Soren H. Mortensen, chief electrical engineer of the Allis-Chalmers Manufacturing Company, for his pioneer work in the development of self-starting synchronous motors and for his contributions to the development of large hydraulic and steam turbine driven generators.

Mr. Mortensen, a native of Denmark, was educated in that country and in Germany and came to America in 1903 for employment by the Westinghouse Electric & Manufacturing Company, and later by the Allis-Chalmers firm. He became chief electrical engineer of the latter company in 1942.

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