

MEDICINE

Chloromycetin Stems Whooping Cough Epidemic

➤ GOOD results with chloromycetin, one of the new mold remedies, have been obtained in fighting whooping cough during a severe epidemic of the disease in Bolivia. The death rate during this epidemic was twice as high as that from whooping cough in North America.

All the children who got the drug were free of fever on the second day after it was started and their coughing fits had greatly decreased. By the fourth or fifth day, the whoops were over.

Because of the limited supply of the drug and the large number of children with whooping cough, only those who were seriously ill got the drug. The good results in these seven children were reported to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Dec. 31, 1949) by Dr. Eugene H. Payne of Parke, Davis and Company, Detroit, where the drug is made, and the following Bolivian physicians: Drs. Miguel Levy, Gaston Moscoso Zamora, Moises Sejas Vilarroel and Edwardo Zabalaga Canelas, all of Cochabamba.

Science News Letter, February 18, 1950

ENGINEERING

Static Electricity Makes Drawings from Microfilm

➤ WORKING drawings of usable size, from microfilm copy, are being made at the Wright-Patterson Air Force Base in Dayton, Ohio, by a process which employs a charge of static electricity on a sensitive metal plate, it was revealed.

The process, now used for the past year or more, is known as Xerography, and is the invention of Chester A. Carlson, patent attorney of New York. Development work on the process of documentary reproduction was carried on cooperatively by Battelle Memorial Institute, Columbus, Ohio, and the Haloid Company of Rochester, N.Y.

The system uses a dry method of making a direct positive enlarged print in approximately one minute. No chemical solutions and no specially-treated paper are required. Unskilled persons can make good Xerography prints easily by following simple directions.

The metal plate used is coated with the non-metallic chemical element known as selenium. This accepts an image in much the same way as does a photographic plate. The Xerographic plate is sprayed with electrons emitted by the fine wires of a high voltage machine just before exposure in the camera or under the enlarger.

During exposure the electrons escape from the areas that receive light, but are retained on the dark areas. The surface of the exposed plate is dusted with a specially-prepared black developing powder. Electro-

static attraction causes the powder to adhere only to those portions of the plate where the electrons have remained.

Printing of this powder image is accomplished by placing a sheet of paper in contact with the powdered plate and then spraying the paper with electrons. The electric charge lifts powder particles from the plate and causes them to stick to the paper. The powder image on the paper is made permanent by a few seconds of heat-treatment. Made of resin and pigment, the powder is melted and fused to the paper by the heat.

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MEDICINE

X-rays Aid Injections For Neuralgia

➤ ALCOHOL injections into the nerve to kill the pain of trigeminal neuralgia, or tic douloureux, can be done with less pain and better results if X-rays are used to determine the position of the injecting needle, Dr. W. H. Sweet of Boston reports in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Feb. 11).

Patients with cancer of the face also are sometimes given these alcohol injections for relief of pain. The injections are made, according to Dr. Sweet's method, into the second and third divisions of the trigeminal nerve, also called trifacial and fifth cranial nerve.

Complete injections into the nerve were made in over 95% of those attempted when X-rays were used for guidance, Dr. Sweet reports.

Relief of pain in trigeminal neuralgia following the injections into the third division of the nerve lasted for at least 30 months.

Dr. Sweet states that he has heard of other physicians using X-rays in this manner but has not seen any published reports on it.

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MEDICINE

Cancer Cells Undergo Chemical Changes

➤ CHEMICAL changes in body cells when they become cancerous are reported by Dr. A. Clark Griffin and associates at Stanford University, Calif.

When rats are fed a diet containing a dye which produces cancer of the liver, there is an increase within the cell of the amount of a chemical, desoxyribonucleoprotein, which is important in the growth and organization of the cell. At the same time there is a decrease in the amount of vitamin B₂, or riboflavin.

These changes may in some cases, Dr. Griffin and associates believe, cause cancer cells to develop from normal cells.

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MATHEMATICS

Translations Give Science Peek Behind Iron Curtain

➤ PEEKING behind the iron curtain to discover new things that Russians are finding out about mathematics, American scientists are now being furnished with English translations of important Russian articles that have reached this country.

The American Mathematical Society in New York has begun to issue these translations, made under a grant from the Office of Naval Research. Scientific literature in the USSR is now written only in the Russian language, although up until 1947 most articles had English, French or German summaries.

Although mathematical notation is a universal language, the explanatory words are also important. The translations are found necessary to give access to important original work that the Soviet mathematicians are doing.

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ZOOLOGY

Cocktail for Oyster May Be Sugar or Starch Chemical

➤ THE cocktail for the oyster in your oyster cocktail has been discovered. It is a chemical, perhaps of the sugar and starch group, which occurs naturally in sea water.

It is what stimulates the oyster to start pumping its food out of the sea. When the amount of this chemical in the water falls below a certain level, the oyster does not pump. Above this level, the more there is of the chemical, the more the oyster pumps.

These findings, which seem to give the first clue to what makes oysters pump for food, were made by Albert Collier, Sammy Ray and Wayne Magnitzky in Pensacola, Fla. The facilities of the U. S. Fisheries Station were made available to them for this research which is reported in the journal, SCIENCE (Feb. 10).

When the temperature and saltiness of the water are at their optimum, the oyster will open for a short time which the scientists call the "testing period." If the oyster's cocktail chemical has reached a high enough concentration, the oyster will immediately start pumping. If the amount of the chemical in the water is not high enough, the oyster will immediately close.

This goes on for days at a time. The oyster may miss the period of high concentration of its hunger-chemical if it fails to open while this concentration is high.

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CE FIELDS

PHYSICS

First Step in Atomic Process in Sun Confirmed

► VERIFICATION has been obtained on earth of the first step in the famous atomic transmutations that keep the sun and stars stoked with energy.

While this new high-voltage research reported from the California Institute of Technology, Pasadena, Calif., is not directly concerned with the theory of the so-called hydrogen bomb, it is new evidence that the source of star energy is the interaction of carbon, nitrogen and hydrogen in the terrifically hot interiors of the stars.

Drs. Robert N. Hall and William A. Fowler of Caltech's Kellogg Radiation Laboratory, subjected ordinary carbon of mass 12 to bombardment with the hearts of hydrogen atoms, called protons. According to the theory of Dr. H. A. Bethe first put forth in 1938, gamma radiation (like X-rays) is given off and a new kind of carbon, mass 13, is formed. This is the first step in a cycle that results in helium being formed and the original kind of carbon being restored to the star. The energy results from the conversion of mass just as is the case in the atomic bomb.

Working with bombardment levels of about 100,000 electron volts, which is small compared with the higher values of giant accelerators, Drs. Hall and Fowler determined the nuclear reaction rates, which the scientists call "cross sections" of the atomic heart. Their results give a rate about 40 times that used by Dr. Bethe, now at Cornell, in his original theory. This means that the individual carbon atom in the center of the sun would live about 50,000 years instead of 2,500,000 years, as the original theory had it.

The important thing about the new experiments, reported in the *PHYSICAL REVIEW* (Jan. 15), is that they are generally consistent with the Bethe carbon-nitrogen cycle of stellar energy. This gives another bit of evidence as to how the energy of the universe is kept renewed. It is from such facts that atomic theory behind earthly developments, such as the possibility of new energy sources, is being discovered.

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MEDICINE

Anti-TB Drug Tried In Veterans Hospitals

► LATE in 1950 is the earliest date at which tuberculosis patients, in general, expect to get treatment with Tibione, German synthetic drug considered promising as an aid to streptomycin and PAS (para-aminosalicylic acid).

But some patients in 24 hospitals of the Veterans Administration, at the National Jewish Hospital, Denver, Grasslands Hospital, Valhalla, N.Y., and Ocean View Hospital, Staten Island, N.Y., may be getting the new drug now.

Trials of the drug's ability, also of its possible dangers and shortcomings, are now under way in these institutions, Dr. Charles E. Dutchess, medical director of Schenley Laboratories, Inc., told the American Drug Manufacturers Association meeting in Cleveland. Schenley is making the drug available for these studies, after a favorable report by two American TB specialists, Drs. H. Corwin Hinshaw of San Francisco and Walsh McDermott of New York. These two went to Germany last summer to see doctors, laboratories and patients about Tibione.

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DENTISTRY

Speedy Drilling Heats up Teeth

► GOT a hot tooth? You have when the dentist drills, especially if he works at high speed without pause. And the heat adds to the pain and discomfort of the drilling.

A 100-degree temperature rise, on the average, takes place when the burr goes through enamel, a 38-degree rise when it drills in the softer, underlying dentin of the teeth. Maximum temperature rise during tooth enamel drilling is 140 degrees.

Low speed, intermittent drilling, with small cutting tool sizes and light pressure applications will keep the temperature down, Dr. Floyd A. Peyton, University of Michigan professor of dentistry, suggests. He reported his temperature experiments at the Chicago Dental Society.

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NUCLEAR PHYSICS

Atomic Bomb Defense Studied by Service Groups

► DEFENSE against the effects of atomic bomb attack is the fundamental reason for the studies of two groups of officers of the armed services now taking special courses at two American universities.

Known as the "radiological defense group," a section of 10 men representing all the armed forces is at Ohio State University, Columbus, Ohio, and another section of 27 officers is at the University of California, Berkeley, Calif.

When studies are completed, these officers will serve as advisers to U. S. military commanders on the new and technical problems involved in defense against radioactive materials. Studies are mainly in the fields of nuclear physics, in the department of physics and astronomy, and in biophysics. A branch of medicine known as toxicology is also included.

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INVENTION

Process Preserves Eggs Without Shells

► EGGS in all their freshness are preserved, without shells, by a quick-freeze process under a method for which a government patent was issued recently. A special container used is included in the patent.

The container in which the eggs are frozen and kept until wanted for use resembles the ordinary ice cube tray of the home freezer, but is considerably smaller. It is made of paper or plastic, with the interiors of the compartments coated with wax. Each compartment holds one egg.

The contents of each shell is placed in its own compartment with its yolk unbroken. The white surrounds the yellow. Small openings between compartments permit the white to flow until the top surfaces are on a level. The filled trays are then put into the freezer.

Patent 2,496,755 was awarded to Louis Schwartzberg, Chicago, for this invention.

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CHEMISTRY

New Stainless Steel Has Desirable Properties

► A NEW stainless steel, containing chromium, nickel and copper, will broaden the stainless steel field of applications because it has a unique combination of desirable properties never before available.

These include excellent corrosion resistance, high strength and hardness, ease of fabrication and low-temperature hardenability. It was developed by the Armco Steel Corporation in Middletown, Ohio, and will be known as 17-7 PH stainless steel. It contains 17% chromium, 4% nickel and 4% copper.

It is recommended for use in the chemical, petroleum, textile and food producing industries for springs, pressure tanks, conveyor parts, washers and similar parts. Its high strength and corrosion resistance make it especially suitable for many applications in the aircraft and automobile industries. Other suggested uses are in carpenters' handsaws, bandsaws, measuring tapes, corset stays and fishing rods.

A form of this new stainless steel, available in soft temper strip, sheet and plate, can be easily fabricated by standard procedures, and then brought to full strength and hardness by heat-treatment.

The process involves heating at 1,400 degrees Fahrenheit for 30 minutes, air cooling and re-heating to about 900 degrees. The hardening process is not only simple and economical but cracking, distortion and decarburization, encountered in conventional heat treating, are virtually eliminated.

Science News Letter, February 18, 1950