PUBLIC HEALTH

Aid Found to Protection Against Lead Poisoning

➤ A NEW AID to protection against lead poisoning was announced by Dr. Lall G. Montgomery and Everett Johnson of Muncie, Ind., at the meeting in Chicago of the American Society of Clinical Pathologists.

People who have been exposed to lead, as in certain industries, excrete through their kidneys more than the normal amount of certain pigments called porphyrins, the Muncie scientists found.

Among college students, student nurses and employees of an industrial plant in which there was no measurable lead exposure, less than 2% excreted more than normal amounts of these pigments. Among employees of industries in which variable amounts of exposure to lead were possible, 34% excreted more than the normal amount of porphyrins. Several patients with lead poisoning all excreted increased amounts of the porphyrins.

The porphyrin excretion, by giving an index of exposure to lead, might help prevent lead poisoning by showing which employees were in danger and needed to change their work and also which spots in industries needed extra protective measures to reduce the exposure to lead.

Science News Letter, October 30, 1948

BIOLOGY

Quickest-Maturing Animals Produce Most Offspring

➤ THE SOONER they mature the more offspring they have. This principle, demonstrated in laboratory animals by Drs. Harold H. Cole and Robert B. Casady of the University of California College of Agriculture in Davis, Calif., will be of obvious practical importance if it is found to hold good in farm animals, they point out.

The two scientists used two inbred strains of rats in their research. One strain, developing to maturity at an average age of 36 days, produced 8.9 young per litter. Rats of the other strain, which required as much as 42 days to reach maturity, produced litters averaging only 6.5 young.

General application of this principle in chickens and turkeys has already been demonstrated by other researchers.

Science News Letter, October 30, 1948

MEDICINE

New Operation Overcomes Paralysis of Vocal Cords

➤ PARALYSIS of the vocal cords can be overcome in some cases by a new operation devised by Dr. William C. Thornell of Cincinnati.

Dr. Thornell reported his operation to the American Academy of Ophthalmology and Otolaryngology meeting in Chicago. He explained that it is for cases in which the vocal cords have become paralyzed because of nerve damage that sometimes happens during operations in nearby parts of the neck.

In these cases the patient has trouble breathing, develops a shrill "crow" in trying to breathe, and may lose his voice entirely.

Former operations to correct the condition were done from the outside of the throat and patients often had to wear a tube through the front of the neck to the windpipe to breathe.

Dr. Thornell operates from inside through the mouth. He removes a tiny cartilage from the tissue supporting the vocal cords. This lets one cord pull aside by its own tension. The air-way is then opened and the patient can breathe normally without the tube from the outside of the throat.

Normal breathing was fully restored in three patients and two of them, he reported, found their voices much improved.

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MEDICINE

Facts on Nervous System May Come from Antibiotic

➤ STREPTOMYCIN, the mold chemical which has been rescuing thousands of persons from germ diseases, may give the most important addition to understanding of a certain part of the nervous system that has been made in the past 100 years. This by-product value of a famous germ-fighting chemical was suggested by Capt. Page Northington, U. S. Navy, at the meeting of the American College of Surgeons in Los Angeles.

Capt. Northington was studying the effects of streptomycin on the eighth cranial nerve. Part of this nerve is concerned with hearing and part with equilibrium, or balance. It is the nerve which is involved in Meniere's disease. Some patients, usually those getting large doses of streptomycin, have suffered damage to this nerve. They have ringing or noises in the ears and walk with a drunken gait.

The main site of damage, Capt. Northington believes from his studies, is not in the nerve and not in its end organ in the brain, but in the "vestibular nuclear complex and adjacent cochlear nuclei" of the internal ear.

If this is confirmed by further studies, a correlation of this information along with clinical examination and functional ear tests should provide some specific knowledge of deafness and tinnitus, or ringing in the ears, of central origin. It would also provide "the most important addition to understanding the functional organization" of the nervous system of the vestibular part of the ear "since original observations on the peripheral components were made by Flourens and Meniere 100 years ago."

Science News Letter, October 30, 1948

IN SCIEN

ENGINEERING

Fiber Glass Boats to Be Tested by the Army

➤ GLASS BOATS are to be tried out by the Army. They will not be transparent like ordinary glass; they will be made of fine glass fiber, matted or woven together and impregnated with a plastic.

The boats will be of the assault type, powered by an outboard motor, and large enough to carry a dozen or so soldiers. One advantage is that they will weigh only three-fourths as much as present aluminum boats; also they have great strength.

Construction is simple. A one-piece boat can be made, using an inflated rubber bag against a mold of wood, gypsum, steel or aluminum over the sides of which the fiber glass and plastic mixture has been spread. The inflated bag gives the necessary pressure. The temperature required is from 225 to 325 degrees Fahrenheit. The manufacturing process is similar to that employed in making fiber glass wings for airplanes.

These boats will never need painting. Coloring matter is included in the plastic used, which is an alkide resin adhesive. Even scratches in the finish will not show. Field repair can be effected with a hot patch. The fungus-proof material has high impact resistance and does not warp with temperature changes.

Science News Letter, October 30, 1948

ENGINEERING

Magnetic Particles Reveal Flaws Inside Metal Tubes

➤ MAGNETIC iron oxide particles, fluorescent lights, a mirror and a surveyor's telescope are being used to detect tiny flaws on the inside surfaces of holes bored in long metal forgings. The process is a laboratory technique and is not for commercial uses.

This flaw-detecting method, in use in laboratories of the General Electric Company, can indicate flaws one five-hundredth of an inch wide in a boring 35 feet long. It involves magnetizing the forging and then blowing the iron oxide particles down the hole.

These particles align themselves with the north and south magnetic poles of any cracks or flaws which are present. Then a small cylinder on which three fluorescent tubes and a small mirror has been mounted is slowly drawn through the hole. The surveyor's telescope is used to view the mirror. Flaws in the forging, being outlined by the iron oxide particles, are visible.

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CE FIELDS

GENERAL SCIENCE

Rocket-Borne Cameras Snap Large Section of Earth

See Front Cover

➤ PICTURES covering the largest section of the earth ever to be photographed at one time were recently taken from a V-2 rocket. It was shot up about 60 miles above the White Sands, New Mexico, Proving Ground, and from it were photographed about 800,000 square miles of the earth.

Two other rocket-borne cameras were installed in a Navy Aerobee which zoomed to a height of about 70 miles and photographed about 300,000 square miles.

Each camera took more than 200 photographs at one and one-half second intervals.

At almost the peak of the Aerobee's flight, altitude 57 miles, the curvature of the earth and the surface haze can be plainly seen as shown on the cover of this week's SCIENCE NEWS LETTER.

The Aerobee rocket photographed a strip 1,400 miles in length, stretching from upper Wyoming on the north to deep into Mexico on the south. The width of the area photographed ranged from 45 to 400 miles at the horizons.

Scientists of the Applied Physics Laboratory of the Johns Hopkins University in Silver Spring, Md., cooperated in this project with the Navy Bureau of Ordnance.

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GEOLOGY

Coral Reefs May Add to Petroleum Supply Some Day

➤ CORAL REEFS in distant waters may some day contribute to the petroleum supply—but not in time to help present shortages. It will be crude oil for future eons which may be hundreds of thousands of years from now.

It is the tiny animals that form coral reefs that are manufacturing the petroleum drop by drop, the American Chemical Society was told in Cambridge, Mass., by Prof. Werner Bergmann of Yale University. Stony coral, he said, contains minute amounts of a wax-like substance which apparently becomes entrapped in the ever-growing reefs.

It would require only a relatively minor geological change to bring about a disintegration of the reef, and only a slight rise in temperature to liquefy the waxy material and bring it together.

It is not inconceivable, therefore, that some coral reefs of a very distant past have contributed to the formation of present-day petroleum, and that present reefs, such as the Great Barrier Reef near Australia, are accumulating material for the formation of petroleum in a very distant future.

The wax, which makes up about one-seventh of one percent of the coral, consists largely of hydrocarbons and complex alcohols, chemicals similar to those in petroleum.

A ten-year study of more than 100 different species of lower forms of marine life has revealed that the fats of sea-dwelling animals contain an unusually high amount of unsaponifiable fats, or fats that can not be converted into soap by treatment with caustic alkali. As a rule, he stated, the more primitive the animal, the higher percentage of unsaponifiable material in the fat. This is an important fact, the biochemical significance of which is not yet clear.

Science News Letter, October 30, 1948

PHYSICS

Spectrum Analyzer Aids Study of High Energy Rays

➤ A GIANT spectrum analyzer, used to determine how energy is distributed in the beam of X-rays from a 100,000,000-volt betatron, powerful atom-smasher, was revealed by General Electric physicists.

It is an eight-ton, scientific, labor-saving device which yields in a few months data that would take many years to acquire by older methods. The development was made by Dr. James L. Lawson, G. E. staff, and sponsored by the Office of Naval Research. The instrument is called a gamma ray spectrum analyzer.

The radiation produced by the powerful betatron is not uniform, but consists of a mixture of rays of various energies, Dr. Lawson explained. Accurate experimentation requires that the distribution of these energies be determined with precision.

This involves the secondary effect of pair formation, by which energy is literally converted to matter. The X-ray is changed to an electron, which has a negative charge, and a positron, similar but positively charged. In a magnetic field these particles are curved in opposite directions. Their curvature in a known magnetic field indicates the energy of the original X-ray. X-rays of high energy produce particles of correspondingly high energy, and these are bent less than those of low energy.

In Dr. Lawson's device, the X-rays hit a thin metal target where the electron-positron pairs are formed. These pass through a vacuum chamber in the field of a powerful electromagnet. They are then detected as they fall on a battery of 100 Geiger counters. Information from the counters is carried to a bank of registers. These show directly the spectrum, that is, the intensity of the beam at each particular voltage.

Science News Letter, October 30, 1948

BIOLOGY

Male Sex Cells Needed For Fertilization Counted

➤ HOW MANY spermatozoa—the motile male sex cells—are necessary to insure the fertilization of one egg and thus start a new life?

An answer to that question is now of great practical importance, with the development of artificial insemination in the livestock industry. Dr. C. R. Austin, of the National Institute for Medical Research in London, reports an effort to find it experimentally, in the British scientific journal, NATURE (Oct. 2).

For essential biological purposes, of course, only one male cell needs to penetrate the egg, so that its nucleus can bring about fertilization. However, it seems probable that a certain amount of a chemical compound known as hyaluronidase, supplied by the male, is needed to enable that one necessary spermatozoon to pass through the egg's covering membrane. With this quantity, some excess of the male fertilizing fluid seems to be required, containing large numbers of sex cells.

Rabbits and rats were used in Dr. Austin's experiments, because of their small size and low cost; but principles thus determined are indirectly applicable to larger animals. He found that a rat egg could be fertilized when less than one hundred male sex cells were present. In the rabbit, fertilization seemed to require the presence of a thousand spermatozoa.

Science News Letter, October 30, 1948

INVENTION

Microphone Clamps on Nose To Cut Outside Noises

➤ A TINY microphone that clamps on the base of the nose like a pair of pince-nez glasses is the newest aid for communications in noisy places like boiler-shops or engine-rooms of ships. It is the joint invention of William R. Blair of Washington and Albert E. Woodruff of Oak Park, Ill., to whom U. S. patent 2,451,317 has just been granted.

Reason for its use is that when an ordinary microphone is employed in such noisy places it picks up and amplifies the noise as well as the speaker's voice and thus makes the bedlam worse than ever. By clamping the microphone against the nasal bone, it is possible to eliminate the air gap and thus keep out the external noises, while it picks up the speaker's words by bone conduction.

The apparatus is held steady by a light head-band, and the light wire connection to the amplifying set leads back over one of the user's ears.

Patent rights have been assigned to Automatic Electric Laboratories, Inc., of Chicago.

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