

PHYSIOLOGY

Anti-Bleeding Property Gained in the Lungs

THE LUNGS are the chemical plant where human blood acquires the clotting property that keeps normal people from bleeding to death after a slight cut or injury, Drs. William DeW. Andrus, Jere W. Lord, Jr., and Joseph T. Kauer have discovered in experiments at New York Hospital and Cornell University Medical College. (*Science*, Jan. 12)

In this breathing apparatus the platelets of the blood, as they disintegrate, "initiate the first stage of the clotting process by releasing thromboplastin, which, in the presence of calcium, changes prothrombin to thrombin," Dr. Andrus and associates suggest. Thrombin is what chemists call a ferment. It acts on fibrinogen to form fibrin, the essential portion of the blood clot.

The liver, the New York investigators believe, is the place in the body where prothrombin is formed. This chemical ancestor of blood-clotting thrombin is formed continuously in the liver, it is believed. The site of its transformation into thrombin has apparently never before been located.

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RADIO

Radio Typewriter Operated Simultaneously With Sound

LAATEST development in the static-less frequency modulation system of radio developed by Maj. Edwin H. Armstrong, which is challenging present supremacy of the giant network, operating on the conventional amplitude modulation:

Extraordinarily faithful sound, music, speech, etc., plus signals to operate a 100-words-per-minute radio typewriter are broadcast simultaneously on the same FM channel without interference with each other, forecasting radio stations of the future that will add to present conventional sound programs a volume of news reports, stock figures, a typewritten information service.

Multiplexing of an FM channel down in the ultra shortwave or megacycle region of radio at a wavelength of about 7 meters or 43,200 kilocycles means that two channels instead of one can add to the familiar broadcasting service—a radio-typewriter as demonstrated in Washington, or a facsimile service, or a radio-photo service or (what is most exciting of all to ordinary radio listeners) stereo-

scopic sound which means that what is happening on an orchestra stage or at a great public gathering can be projected into your home with perspective sound. You'd be able to follow an actor as he walks across the stage; you'd be able to tell that the drums are on one side of a symphony orchestra and the harp on the other.

Just now frequency modulation is asking a little more room in the ether . . . in the area of the radio spectrum that was waste and unwanted a few years ago. In a band of 5 megacycles, FM could duplicate the present broadcast services. In one television channel 30 FM channels find plenty of room. The FCC is being asked to give a little more space to FM. In the 40 to 120 megacycle region where FM is most effective, 56% of the space is assigned to television, 31% to government use, 9.5% to amateur and only 2% to FM.

FM broadcast stations can themselves relay programs around the nation without land wires once stations are established at about 40-mile intervals, a fact that has cost-saving implications. The transmitting stations cost less for FM than for conventional radio. Maj. Armstrong predicts the receivers will be no more costly once the demand comes. He should know since he is daddy of the superheterodyne and the regenerative circuits so essential to ordinary receivers.

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CHEMISTRY

Transparent Belts Made From an Elastic Plastic

THOSE transparent belts now on sale, which are strangely and slowly elastic, are made from one of the few plastics that are elastic. Most of the synthetic substances, used in large variety and quantity, that are called plastics are rigid and solid materials, plastic only during manufacture when their ability to change shape is of great advantage.

The chemical stuff from which the transparent and vari-colored belts are made is one of the polyvinyl resins made from natural gas, coal, oil, salt and air. Better than leather and rubber in many respects, it is flexible and tough as well as elastic. It will not oxidize nor crack, nor is it affected by mold, mildew, water or perspiration. Heat is used to join two pieces together simply and rapidly. The belts are almost the same sort of material as the polyvinyl layer in the new highest safety glass sandwich.

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IN SCIEN

BOTANY

Daffodils Big as Plates From Thiamin Solutions

DAFFODILS with blossoms as large as salad plates. Red tea roses with five-inch buds. Extremely dilute solutions of Vitamin B₁ (thiamin) in water used on growing plants produced such effects in researches at the California Institute of Technology.

In human beings this vitamin prevents and cures the serious nervous disorder known as beri-beri. In garden and field it is also useful. In addition to making plants grow vigorously and producing abnormally large flowers, this vitamin allows the transplanting of flowers and trees at any season. Concentrations as low as one part in 100,000,000 prevent "root shock" when flowers, shrubs, and trees are transplanted.

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MEDICINE—PHYSIOLOGY

Heart Disease Remedies Act Like Gland Hormone

DISCOVERY that medicines used in heart disease, such as digitalin and strophanthin, can to a certain extent double for the life-essential hormone of the adrenal gland cortex has apparently given scientists a new clue to the chemical composition of this gland substance which is a life-saver for Addison's disease patients.

The heart disease remedies prolonged the life of animals lacking adrenal glands, Dr. Raymund L. Zwemer and Bertrand E. Lowenstein, of the College of Physicians and Surgeons, Columbia University, report. (*Science*, Jan. 19) From this fact and others gleaned in their latest studies, they conclude that the gland hormone may be a glycoside just as the plant extracts digitalin and strophanthin are.

Patients suffering from Addison's disease, in which the adrenal gland cortex fails to produce enough of its hormone, have been helped by a synthetic chemical made in Switzerland which scientists believe from its effect on the patients is the same as the hormone from the gland. This synthetic chemical has been called desoxycorticosterone acetate.

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CE FIELDS

METALLURGY

Electricity Helps Polish Metal in Newest Process

GETTING a high polish on metals without use of "elbow grease" is achieved by a new process developed at the Battelle Memorial Institute in Columbus, Ohio. Shiny surfaces of mirror quality are produced by the use of chemical solution and electricity.

A multitude of industrial applications are foreseen for the new process. It has the great commercial advantage of being much less costly than other methods of polishing.

Ordinary pieces of steel, nickel, copper, brass and zinc, just as they come from the mill, can be treated to give smooth reflecting surfaces that are even superior in quality to polishes obtained in the past by much harder work.

Along with the polishing, the metals are given a protection against corrosion that, while skin deep, is nevertheless effective.

The treatment is the reverse of the usual electroplating. The electricity takes metal away and leaves it polished, instead of adding a metallic layer as in ordinary plating. The solution used is strongly oxidizing in order to eat away the minute high spots of the metal surface. This solution also is the factor that causes the surface to be less susceptible to tarnish and corrosion.

Electrolytic polishing can be applied to intricate stamped metal articles, castings, wrought metal objects, wire and all sorts of metallic forms, many of which can not be polished by the older methods.

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ARCHAEOLOGY

Pig Latin and Love Songs Found on Pompeii's Walls

"UTSNAY" (meaning nuts), scrawls the smart modern youngster in Pig Latin.

Two thousand years ago young Pompeians were doing exactly the same thing, twisting words like urbanum around into "anumurb" and reversing their names. Only theirs was real Pig Latin, based on Latin itself.

"Particularly interesting" is the verdict on this childish practice, by Helen H. Tanzer, who has just published an archaeological report on "The Common People of Pompeii" (The Johns Hopkins Press), based on the irrepressible habit Pompeians had of scrawling on walls.

Archaeologists call the doodling of the ancients "graffiti." Pompeians were so addicted to wall scribbling that no less than 15,000 graffiti have been uncovered for archaeological study in the ruins.

A Pompeian with time on his hands and a sharp nail would write—what?

Well, he might get his political views out of his system.

He might show off by writing a classical quotation, badly spelled.

He might write his opinion, good or bad, of some inn's food, or the barber nearby.

Lines from popular songs were in his thoughts, and were amusing to scrawl. Love songs were as flowery as any crooner's ditties today. Sample: "Any one could as well stop the winds from blowing and the water from flowing as stop lovers from loving."

For archaeologists like Miss Tanzer, there is a mine of information in all this about occupations and customs of a famous city and a flash of insight into its psychology. Pompeii in the shadow of Vesuvius had its fun.

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PHYSIOLOGY

Seals Store Oxygen Supply In Hemoglobin of Muscles

SEALS, which can swim under water for six minutes or more without coming up for air, apparently store a big reserve of oxygen in the hemoglobin of their muscles. Research suggesting this possibility is reported by Douglas Robinson of Harvard University.

Mr. Robinson made a quantitative analysis of a sample of harbor seal muscle for hemoglobin, and found that it contained about seven times as much of this oxygen-holding compound as an equal weight of beef muscle. A calculation of the total oxygen that a seal could take under water, in lungs, blood, body fluids and muscle, indicated enough to last the animal 14.4 minutes if it did not move. This should be enough for six minutes of active swimming.

One observer, however, has reported an actively swimming immersion by a seal, of 15 minutes. For this, says Mr. Robinson, "there still seems to be no physiological explanation."

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MEDICINE

Find New Pneumonia Germ And Make Serum for It

DISCOVERY of a new kind of pneumonia germ, responsible for more illness than some of the other types, and development of a serum for detecting its presence and treating its victims are announced by the New York City Department of Health and Lederle Laboratories, Inc.

The germ is called pneumococcus Type 33. Hitherto scientists have recognized 32 types of pneumonia germs, following the classification by the late Dr. Georgia M. Cooper, N. Y. C. Department of Health.

The newest one, Type 33, was isolated by Dr. Jesse G. M. Bullowa, of Harlem Hospital's pneumonia service, and was at first called the Wilder strain. Numerous specialists during the pneumonia season of 1937-1938 reported that they were encountering pneumonia in their patients which, though the germs seemed to be related to Type 9 pneumococci, did not respond to treatment with Type 9 pneumonia serum treatment. The germs, isolated by Dr. Bullowa, and by other investigators in the United States and abroad, were studied in the New York City health department laboratories where they were designated as a new type of pneumonia germ.

Serum for diagnosis and treatment of this type of pneumonia infection has been prepared by Lederle Laboratories, and reports since it has been in use show that it is a more frequent causative agent of pneumonia than some of the established higher types.

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AGRICULTURE

Female Paper-Mulberry Is Really Weaker Sex

LAATEST in the battle of the sexes in the plant world: the female of the paper-mulberry tree, that supplies paper to Asiatics and clothes to South Sea Islanders, is not so hardy as the male when transplanted to the U. S. A.

In this tree, as in many others, the male or staminate trees are not capable of carrying on the species. There must be female trees nearby to bear strange flowers and mulberry-like fruit. Prof. E. A. Andrews of Johns Hopkins University finds that male trees survive as far north as New York but the females disappear farther south than Baltimore. So he asks: "Is the female of the species more tender than the male?" (*Science*, Jan. 12)

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