MEDICINE

Thrombin Treatment Promises To Save Lives of "Bleeders"

Tried Out Under Extreme Conditions on Animals, Blood-Clotting Substance Stops Hemorrhages

A HIGH-SPEED blood-clotting substance that may prove life-saving to "bleeders" and to patients undergoing surgical operations is reported by Drs. W. H. Seegers, E. D. Warner, K. M. Brinkhous and H. P. Smith, of the State University of Iowa (*Science*, Jan. 27).

Sprayed from an atomizer onto a profusely bleeding wound in an animal's liver, the material checks the bleeding completely in five seconds or less. A small amount (one cubic centimeter) of the material in a one per cent. solution will clot an equal amount of blood within two seconds. Blood normally takes from two to five minutes to clot, and the rate is so much slower in hemophilia that these patients may bleed to death from small cuts.

What the speedy blood-clotting material will do for human patients who are bleeding dangerously remains to be seen after the scientists learn whether the material is sufficiently germ-free to be safe for human use.

"Far more powerful" than any similar blood-clotting substance previously reported, this material is a gray-white powder obtained by special chemical treatment of blood and beef lung. This powder, which dissolves in water, is thrombin.

Thrombin and its role in blood-clotting has been known to scientists for some time. The gray-white powder which the Iowa scientists obtained, however, is a highly purified thrombin and is five times as powerful a blood-clotting agent as the most efficient thrombin previously reported.

This thrombin, the Iowa scientists report, is not poisonous when used to control the oozing of blood from the surfaces of tissues in surgical operations. When it is sprayed on such surfaces, a thin film of blood forms almost instantly and this seals the smaller blood vessels. The larger ones are kept from bleeding by being tied or clamped as a preliminary measure.

Bone and brain surgery should be especially helped by the new thrombin, it appears, if it proves applicable for human use. The prolonged bleeding from bone, often very troublesome to the surgeon during operations, can be checked by thrombin within five to ten seconds. The Iowa scientists report that in animals they have been able, by using thrombin, to cut out portions of the brain and to check with ease the "hemorrhage which is otherwise so difficult to control."

Science News Letter, February 11, 1939

NEW WILDLIFE STAMPS

The 1939 wildlife stamps, now going on sale, include a considerably larger variety of subjects than did the first series, issued last year. Two typical designs are those of a Chautauqua muskellunge, painted by Fred Everett, and of a cougar or mountain lion, by Morgan Stinemetz. The stamps are sold through the National Wildlife Federation and the proceeds used in promoting the study of wildlife problems and the conservation of native animal and plant species.

MEDICINE

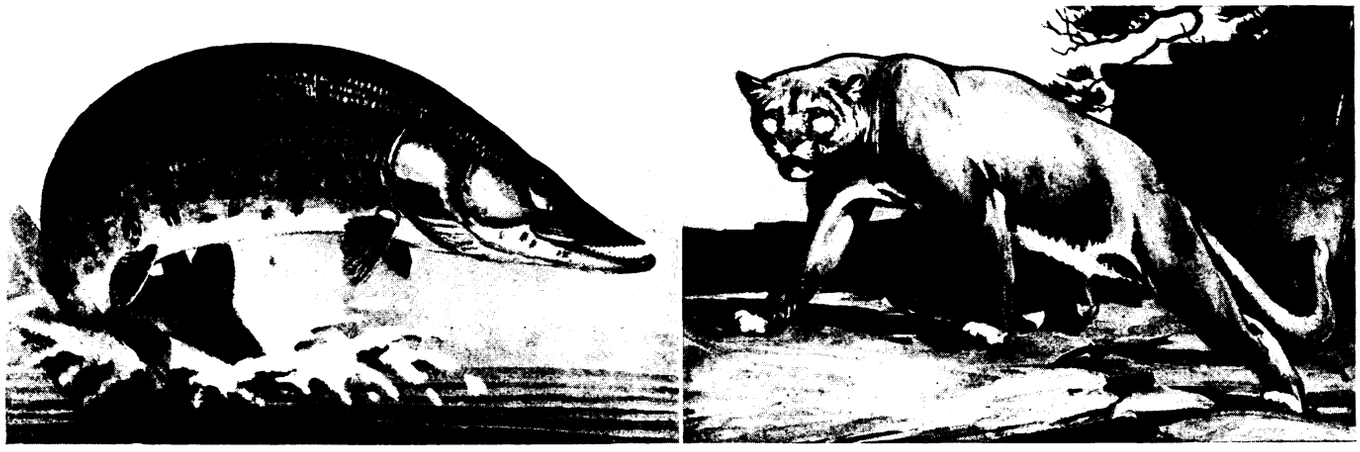
Time Important Factor In X-Ray Treatments

BILLION-volt X-ray tubes for cancer treatment have a magic sound that has won the popular imagination. High voltages and other physical matters such as depth of penetration and wave-length are, however, relatively unimportant in cancer treatment when compared to the prosaic factor of time.

The importance of the time factor has been stressed by Dr. Francis Carter Wood, director of the Institute of Cancer Research at Columbia University.

The time factor in X-ray treatment means the rate at which dosage is applied, Dr. Wood explained. Its importance has long been recognized in the use of drugs. If you swallow a teaspoonful of acetic acid, Dr. Wood said to illustrate this point, it would probably cause a fatal burn. But you can take the same quantity in a French dressing over the course of a week without the slightest damage. The healthy tissues can resist a small amount of the acid but they cannot stand it in a concentrated form.

The same thing applies to X-rays. Giving large doses rapidly does much damage to healthy tissues, scientists now know. This big, rapid dose may damage the cancer tissue also, but what good is that, Dr. Wood asks, if healthy tissue is injured and ulcers or other trouble almost as serious as cancer arises.



X-ray treatment for cancer should be given very slowly, Dr. Wood advises. The slowness is the secret of the success of radium treatment. Radium has always been used in moderate quantities and over long periods because it was impossible to get large quantities of it and physicians had to get the effect by prolonging the treatment.

When physicians do the same thing with X-rays, they get the same beneficial results that radium gives, Dr. Wood declared.

Science News Letter, February 11, 1939

AVIATION

Plywood Airplane Parts Built By Revolutionary New Method

U. S. Army and Navy Officials Keenly Interested In Process Promising Cheap and Rapid Production

THE CHEAPEST and simplest process for mass production of airplanes ever devised is now under secret development at a factory in Bendix, N. J.

Airplane wings, seaplane floats and other large aircraft assemblies are made by wrapping sheets of flexible plywood around formers. The process is very much like the job of building a suit of clothes around a tailor's dummy. This revolutionary new method of plane construction is pioneered by Eugene L. Vidal, former chief of the now non-existent Bureau of Air Commerce.

Watched by Army, Navy and government aeronautical enginers with the keenest of interest, the process dispenses with costly molds and skilled labor required by other methods of using plastic-bonded plywood. The U. S. Navy is already testing seaplane floats made by the Aircraft Research Corporation, of which Mr. Vidal is president.

Cheap production of 10 or 10,000 planes of a given type is now possible for the first time. Standard methods of all-metal aircraft construction or of molding plastic-bonded plywood all require extremely expensive dies and molds whose cost can be borne only if a large number of planes are made.

After the thin plastic-bonded plywood sheet is wrapped around the formers and has been reinforced by the use of stiffeners, the whole wing or other section is placed inside a rubber bag, from which the air is then evacuated. Air pressure collapses the bag around the plywood, forcing it around the formers.

The wing and rubber bag are then placed in a steam curing oven. After the wing has been cured, the bag is removed. The formers are collapsed and withdrawn from the wing section, and are ready for use again. The rubber bag may also be used over, it is understood.

Mr. Vidal and his associates have not yet manufactured a whole airplane, confining themselves thus far to making the most difficult individual sections.

Science News Letter, February 11, 1939

ENGINEERING

Industrial Mobilization Planned For U. S.

WARNING that force and the threat of force govern the national policy of a number of nations in the world, Assistant Secretary of War Louis Johnson told members of the American Society of Mechanical Engineers that in industrial preparedness the United States is better off now than at any time in its history.

America must stand on guard while this world policy of force exists, Mr. Johnson added, but its preparedness is aimed for defense, not offense; for protection and not aggression; not to wage war but to keep out of war.

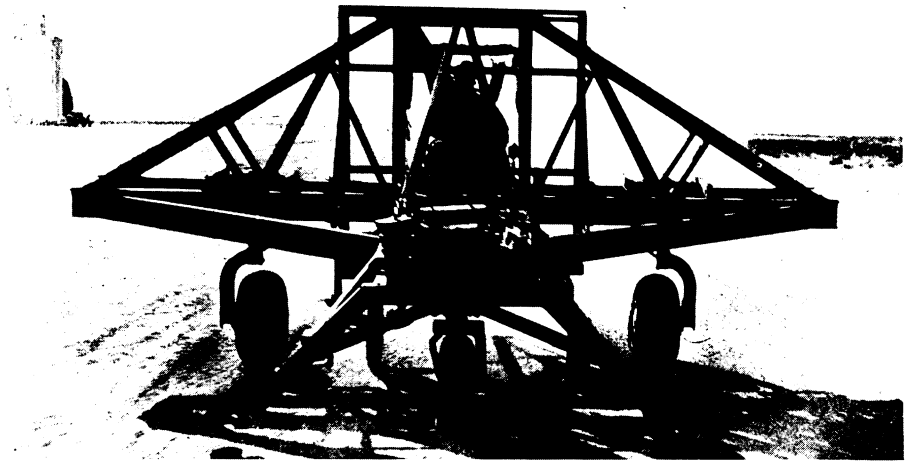
The industrial plans for America's participation in war are now laid, Mr. Johnson indicated. Ten thousand plants, throughout the nation, are earmarked for immediate wartime production if the need arises. Their managers know the tasks assigned to them and have expressed their ability to carry out these tasks.

Mr. Johnson paid tribute to mechanical engineers, as the key men in industrial production, for their cooperation with the Army in its preparedness program.

It was the U. S. Army, Mr. Johnson pointed out, which took Eli Whitney's idea of interchangeable parts for rifles and the concept of mass production and made it the basis of military ordnance.

These basic ideas are still paramount in American military policy. Thus the Army, said Mr. Johnson, ever seeks simple equipment which can be manufactured most easily.

"There is a tendency manifest among military designers of arms, ammunition and accessories," he declared, "to develop complicated machines not readily adaptable for mass production. Against such a trend, we must continually guard. We should strive to develop simple



FOR HAPPIER LANDINGS

This curious-looking cart is no cart at all but a frame used for testing the three-wheeled landing gear with which more and more airplanes are being equipped because of its greater safety. All possible take-off and landing loads were duplicated with this apparatus by shifting the weights on the frame and by towing the apparatus behind an auto.