MEDICINE

Protein Combats Shock

Solution of proteins may possibly prove to be a substitute for blood plasma in treating hemorrhage from war wounds.

➤ A POSSIBLE substitute or supplement for blood plasma in treating shock from hemorrhage in war wounds in case of shortages of plasma is announced by Dr. Robert Elman and Dr. Carl E. Lischer, of Washington University School of Medicine and Barnes Hospital, St. Louis (*Journal, American Medical Association,* Feb. 13).

The substitute would be a solution of hydrolyzed proteins, enzymatically digested, from either beef blood plasma or casein, the chief protein of milk. In laboratory experiments such solutions showed themselves as good as blood plasma for treatment of animals in shock from repeated hemorrhage.

The animals that got the protein solutions survived for a 50% longer time and could withstand 25% greater blood loss than untreated animals, and their blood pressures also stayed at higher levels.

Solutions made from pure crystals of all the essential amino acids also were definitely beneficial but not as markedly as the solutions of hydrolyzed proteins.

Caution is needed before the encouraging results of these experiments can be applied to treatment of human patients suffering surgical shock from hemorrhage, the scientists warn. They believe further study is justified because of the practical advantages such solutions offer.

While plasma and whole blood are "of vast importance in the treatment of shock," they point out, "it is probable that in wartime the number requiring such treatment might well exceed the available supplies of plasma and that in the armed forces many situations might arise in which blood donors were not available."

The injection of one quart of plasma requires bleeding four donors and considerable processing, not to mention the transport and storage space problems. Solutions of amino acids and hydrolyzed proteins, on the other hand, are as convenient to give, the scientists state, as sugar and salt solutions.

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***SEWING STEEL** — Electric stitches are being made in this stainless steel structure by fusing sheets of metal together wherever the worker applies the electrodes. Resulting connections are much stronger than would be rivets of the same size.*

ENGINEERING

Electricity Sews Metal

➤ STITCHING METAL? Why not? Airplanes and railroad cars and all sorts of things are being made that way out of stainless steel—even masts for ships.

Sewing is done with an electric thread but no needle pierces the metal. Instead, two pencil-like electrodes clamp the steel sheets between them. Suddenly a young lightning bolt is shot across them—clean through the metal. It all happens in a very small part of a second.

In that flash of time some of the metal in the path of the current comes to fusion heat. It so happens that the greatest heat is generated just where the sheets are faced together, and a little spot of one sheet becomes fused to another little spot of the other. Both sheets are then joined together by a stainless steel connection. In stainless steel it is a strong connection — much stronger than would be a rivet of the same size.

But the connection can't be seen. It is between the inside surfaces of the sheets. "How do we know they are joined, and how strongly?" This is answered by a simple little device called the recorder. This instrument actually measures the amount of current used—even if for so brief a flash—and also the time during which the current is applied. Both readings tell the exact amount of electric heat used, and the amount of the heat in turn tells how much metal has been brought to fusion —hence the size of the weld.

The value of each weld is also recorded on a piece of tape by the recorder. If any one weld fails to come up to specifications, a bell rings and shuts off the welding machine. The bell is sometimes known in the shop as the "raspberry". You can well imagine that the welder does not like to have the "raspberry" loudly advertising his failure.

Many women have been trained and employed by the Budd Company to do this new kind of stitching in the fabrication of airplane parts and structures.

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ENGINEERING

Rockets Help Heavily Loaded Planes Take Off

➤ POWERFUL rocket jet motors may be used soon as auxiliary power to assist heavily loaded bombers and cargo planes in the take-off. Cargo carried by a plane is limited to the weight with which it can get off the ground. Auxiliary assistance to help get it into the air would permit it to transport a much heavier load than is now possible.

Auxiliary power during the take-off has been often suggested and various sources of power have been tried. There is nothing new in the idea. The Wright brothers used a land catapult at Kitty Hawk. So far as is known, rocket power has not been used in America, but it is