MEDICINE

New Blood Expander

A microbe from the soil, Bacillus subtilis, yields a chemical which becomes a cross-linked glutamyl polypeptide, reported ten times more effective than serum albumin.

➤ FROM THE earth, source of many antibiotic remedies, scientists have now dug up a microbe which gives a promising blood plasma expander for treating burn shocked patients.

The particular microbe is called *Bacillus subtilis.* The plasma expander that comes from it is called a "cross-linked glutamyl polypeptide." This substance is reported 10 times more effective than serum albumin of blood at attracting water into the blood stream.

Development of this blood plasma expander from the soil bacillus was achieved by Dr. Max Bovarnick of the Veterans Administration, now stationed at the VA Hospital, Brooklyn, N. Y.

Simultaneously with announcement of this achievement, two other government scientists, Drs. Curtis B. Thorne and Riley Housewright of the Army Chemical Corps Biology Laboratory, Camp Detrick, Md., reported a method for growing the soil bacillus in large quantities so that low-cost production of the new plasma expander will be possible.

The subtilis bacillus does not yield the plasma expander directly. What it yields when grown on suitable medium is a simple straight chain peptide. Peptides are derived from proteins and are made up of two or more amino acids, commonly called protein building blocks.

The straight chain peptide from the subtilis microbe is a slender, rod-like molecule which slips out of the blood vessels too fast to be useful long enough as a plasma expander.

Dr. Bovarnick solved this problem by changing the simple peptide into the cross-linked glutamyl polypeptide, which has molecules shaped more like a Christmas tree and of the right size for staying in the blood stream long enough.

Tests on laboratory animals and humans so far show the new plasma expander can safely be injected into the blood stream, and stays there long enough so that its blood expanding property should see the patient through the emergency period after severe burns or other wounds, just as blood or plasma would.

After it has served its purpose in the blood stream, it is broken down by the body and then used in part by body tissues as food and in part excreted.

Next step on Dr. Bovarnick's program is to tag the expander with a radioactive chemical to learn exactly what becomes of it in the body.

The new expander can be sterilized by steam under pressure, does not form a jelly at freezing temperatures, and can be stored without loss of potency for practically indefinite periods in either the dry state or in solution.

The molecule size and shape can be changed without reducing the expander's efficiency. This means that different preparations of the substance could be made and the doctor treating a patient could select one that would stay in the blood for a few minutes or for hours, as needed.

Collaborating with Dr. Bovarnick and his VA associates, Drs. Bruce Kessler and Daniel O'Connell, have been researchers at the Merck Institute of Therapeutic Research, Rahway, N. J., where the microbe was grown and much of the animal work done.

Science News Letter, May 15, 1954

BACTERIOLOGY

Hard Shell Chemical in Disease-Causing Fungi

➤ ALL FUNGI that cause diseases in man or other animals have a horny chemical called chitin as the material for the skeleton of their cell walls.

Chitin is a polysaccharide, or carbohydrate, which is the principal constituent of the shells of crabs and lobsters and the shards of beetles.

The conclusion that it is in the cell wall skeletons of all disease-causing fungi of man and animals is reported by Drs. F. Blank of McGill University, Montreal, Can., and Ruth C. Burke of Yale University in *Nature* (May 1).

They base their conclusion on studies of *Coccidioides immitis,* the fungus that causes coccidioidomycosis, a lung infection known also as valley fever. They were studying its chemical composition to determine its position in the biological world.

Science News Letter, May 15, 1954

HERPETOLOGY

Finger-Size Snake Can Swallow Large Eggs

➤ SPECIAL EQUIPMENT and "know how" enable an African egg-eating snake no larger than a man's middle finger to swallow a goose egg.

Instead of teeth, the snake, *Dasypeltis,* has a series of thick gum folds and its mouth lining is pleated like an accordian. This means it can get very large eggs in its mouth.

Modified spine projections in its throat act as skids carrying the egg to the stomach entrance. There sharp spines cut the egg open and the throat muscles squeeze the egg's contents into the stomach.

Bony knobs in the throat roll up the sides of the shell into a compact bundle which is ejected from the mouth with a few wiggles. *Dasypeltis* gorges on eggs during Africa's two bird nesting seasons and lives on stored up fat the rest of the year.

Science News Letter, May 15, 1954

EGG-EATING SNAKE—This photograph, approximately one-third life size, shows the disparity between the snake and the egg it is swallowing. The jawbone seems to leave the scales of the skin region as it starts to swallow the egg. Note the suction folds, visible along the edge of the protruding jaw.