

MEDICINE

Aid to Stop Bleeding

New type specially treated cotton which the body can absorb can be used as pledgets soaked in thrombin. Need not be removed from wound.

► HELP in stopping bleeding during operations on the brain or elsewhere has been discovered in a new type of specially treated cotton, called oxidized cellulose. Dr. Virginia Frantz of the Department of Surgery, College of Physicians and Surgeons, Columbia University, has shown experimentally that this new material, unlike cotton, is absorbed when left implanted in the body.

Pledgets of the material soaked in thrombin have been used successfully to stop bleeding in 30 operations by Dr. Tracy J. Putnam, of the Neurological Institute and the College of Physicians and Surgeons, Columbia University. Surgeons will find details in a forthcoming issue of *Annals of Surgery*.

It is the thrombin, and not the oxidized cellulose, which stops the bleeding. Cellulose oxidized with nitrogen dioxide, however, gives the surgeon a better method than ever before for using the blood-clotting thrombin to check hemorrhage.

Developed about a year ago by Dr. W. O. Kenyon, C. C. Unruh and Edward C. Yackel, of the Eastman Kodak Research Laboratories, the new type oxidized cellulose has found its first publicly announced use in this life-saving application, though an earlier report suggests a possible future use in the fight against germ disease. Its birth in an industrial chemical laboratory and Dr. Putnam's report that it became available for surgical use "by a fortunate coincidence," suggests, however, that it may be finding other, as yet unannounced, uses in war industry.

Cellulose oxidized by nitrogen dioxide is a fluffy white material, looking like cotton wool. It has certain unique properties which make it especially useful to the surgeon. It dissolves slowly in slightly alkaline fluids such as blood. It is absorbed by the body from various tissues including the brain without causing inflammation of any consequence as was shown by Dr. Frantz. It can be sterilized by boiling for three minutes and can be kept in 70% alcohol until needed.

Further important medical and sur-

gical uses for it are foreseen by Dr. Putnam.

"Thin sheets of such treated cellulose," he states, "might be used to control bleeding from the cut surface of parenchymatous organs; for example, the bed of the gall bladder. A similar gauze might be used in skin grafting. For first aid use in the field, an antiseptic such as sulfapyridine, penicillin or gramicidin might be added to such tampons for packing deep wounds."

Dr. Putnam used this material by saturating it in a solution of the blood-clotting thrombin. Tiny pledgets were made by teasing out and folding the wet cotton.

The troublesome and often dangerous bleeding points during brain operations were first plugged with moist ordinary cotton and this was sucked dry. The pledget containing thrombin was then rapidly substituted for the cotton plug and covered with another piece of moist cotton which in turn was sucked dry by special surgical suction apparatus. Even with active bleeding from an artery, Dr. Putnam reports, this second tampon or plug could usually be removed within a minute leaving the treated cellulose solidly clotted.

The role of thrombin in the clotting of blood when it is shed has long been known and purified preparations have been available for some time to aid in checking hemorrhage. Its practical use in surgery, however, has been limited by difficulties of application.

When fluid preparations are used, Dr. Putnam explains, the clot which is formed in less than a second with flowing blood is apt to be washed away before it can stick to the cut, even though the blood flow is no more than an ooze. If the thrombin is applied on plugs or pledgets of ordinary cotton, the bleeding is checked even under adverse conditions but if the pledget is removed the hemorrhage usually begins again at once.

The new type cellulose, however, need not be removed, since the body can absorb it without injury. This means that the clot formed through the action



KATYDID — This unusual photograph of a familiar face was taken by George A. Smith of Quarryville, Pa., with a home-made spotlight and two-second exposure.

of the thrombin need not be disturbed and can remain in place to stop bleeding effectively.

This new kind of oxidized cotton is related chemically to the sugary outer coatings of certain pneumonia germs, technically known as their capsular polysaccharides. This and other findings about the two materials which may aid in the better understanding of immunity or resistance to pneumonia and perhaps other diseases were reported by Dr. Michael Heidelberger and Dr. Gladys L. Hobby, of Presbyterian Hospital, Columbia University, to the National Academy of Sciences.

The new oxidized cotton contains cellobiuronic acid units, separated by glucose, at intervals in the long cellulose chain and forms water-soluble salts. This type of structure is what gives virulence and type specificity to the sugary coating of Type III and Type VIII pneumonia germs.

The oxidized cotton, moreover, behaves immunologically like the pneumonia germ polysaccharides. It precipitates antiserum for these types of germs much in the way shown by the sugars isolated from the germs themselves.

These findings emphasize, the Columbia scientists state, the close correlation between the chemical composition of a germ's carbohydrate material and its specific behavior toward the antibodies developed by the body to fight germs.

Predictions as to how carbohydrates will react in various antisera can be made, the findings also show, when the con-

stitution of the repeating chemical unit in the carbohydrate is known.

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PUBLIC HEALTH

Plan Physician Control

New federal body to allot physicians to medically neglected communities is advocated by committee of physicians. U. S. Public Health Service would operate it.

► A CENTRALIZED federal body to control medical manpower and distribute physicians so that the health of the civilian population as well as the armed forces will be maintained is advocated in a statement by the Committee of Physicians for the Improvement of Medical Care, of which Dr. Channing Frothingham of Boston is chairman and Dr. John P. Peters of New Haven is secretary.

"Maintenance of the health of the civilian population is as much a national responsibility as is the control of the production and distribution and the proper allocation of commodities between the armed forces and civilians," declares this eleventh statement to be issued in the seven years of the committee's existence.

Only a nation-wide plan will be effective, it is argued, because of the barriers of medical licensure and the uneven distribution of physicians between the several states. No reliance can be placed, it is declared, on plans predicated upon the voluntary relocation of physicians.

Calling attention to the shortage of physicians reported by the Office of War Information, it is stated that "so critical has the situation become that the health of many communities is seriously threatened." The Procurement and Assignment Service now in operation has been unable to maintain an adequate supply of physicians in many areas, it is stated, although it was set up "to protect these civilian communities by preventing inequitable and uneven recruitment of physicians for the armed services."

The United States Public Health Service would be the operating agency entrusted with the responsibility of protecting the health of the civilian population, under the committee's plan. It is suggested that it may be necessary for the Public Health Service to grant commissions to physicians in order that they may be assigned to communities where

they are needed, without interference from state licensure.

Nurses and other medical personnel would be included as would be hospital and other facilities where they are needed. Health centers would be established at which groups, including specialists, could work as coordinated units. The plan contemplates the full use of Negro physicians and of qualified refugee physicians.

Where services are provided by U. S. Public Health Service officers who cannot accept fees, the persons treated, when they can afford it, would pay for their medical services on a pre-payment plan or by fees for services rendered. These funds would be devoted to an expansion of the medical services, a plan that is now in effect in certain localities.

Changes in medical education made by military authorities were criticized in the committee's report. Reduction of the premedical course to 21 months instead of the earlier war-accelerated 36 months period makes it "difficult to obtain adequate preparation for medical education" although this action will not give the armed forces more physicians until 1949.

Replacement of younger medical school teachers by older physicians threatens to cause "deterioration in the quality of teaching."

"Instead of vesting the control of our educational system in the military authorities," the report states, "it would be preferable to establish at once a comprehensive authority to assume direction of medical education, with separate bodies responsible for the major scientific and technical branches."

The endorsement of the committee is given to the bill, S. 1161, introduced into the Senate by Senator Robert F. Wagner (Dem. N. Y.) which provides "a framework and a basis for discussion from which a constructive program for

improved medical and health care of the American people may be developed." The bill provides for an advisory health council.

The Committee of Physicians' report also controverts the claims of the National Physicians Committee for Extension of Medical Services, another organization more closely aligned with the American Medical Association, that the private independent practice of medicine has been responsible for practically all the important advances of medicine in modern times.

Science News Letter, July 17, 1943

BIOLOGY

Penicillin Production on Large Scale Now Planned

See Front Cover

► PENICILLIN, powerful germ-killing substance made from a mold like that which grows on stale bread, may soon be manufactured on a large scale for military use if efforts of the Squibb Biological Laboratories and other large drug manufacturing companies are successful (See SNL, May 29).

The mold from which penicillin is made is pictured on the front cover of this week's SCIENCE NEWS LETTER. What



GERM KILLER—The hole of this doughnut was made when staphylococcus germs in the white area, which originally filled the plate, retreated before the onslaught of penicillin, germ-killing chemical from the mold, *Penicillium notatum*, seen as the white spot in the center of the hole and, greatly enlarged, on the cover.