the outer exposed surface. The scales have an imbricated formation and are rather brittle in consistency. The surface that was in opposition to the skin lesion was slightly saucer-shaped and has a gray color devoid of pigmentation. Microscopic examination shows marked keratosis of the proliferated upper strata of epidermis. The pigmentation noted above is of very superficial extent. The destroyed growth which came away a month after the radium application showed no essential difference from the above except that there was much less marked pigmentation.

Evidently Roentgen-ray keratoses, while in the precancerous state, are curable by radium applications.

850 Seventh Avenue.

TISSUE EXTRACT AS A HEMOSTATIC

A PRELIMINARY REPORT *

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For some time we have been carrying out experiments with various preparations which increase the coagulability of the blood and would therefore be expected to be of value in stopping hemorrhage. The most useful of these preparations has been found to be one made from tissue. At first homologous tissue was used—in the case of bleeding in human beings, human uterine tissue; more recently, however, the liver or the brain of cattle has been employed. This tissue is obtained fresh from the slaughter-house, washed thoroughly free from blood, ground up in a machine, extracted in salt solution in the refrigerator and then filtered. In its preparation, aseptic precautions are observed as far as possible. The extract, which contains some fine suspension of tissue in addition to tissue juice, is made up with 0.3 per cent. of trikresol and preserved in this way. Aerobic and anaerobic cultures of this fluid have been found sterile. In addition to this liquid preparation, a powder has been prepared—the tissue has been desiccated and then finely ground up in a mortar.

Thromboplastic preparations treated with this small percentage of trikresol have been found to maintain their potency for at least a month. This is a distinct advantage. The difficulty has been that these preparations rapidly undergo autolysis with the formation of antithrombic substances, rendering them not only inert, but of negative value.

It is not intended in this brief report to enter into the details of our experiences with this product. We have found, however, in animals, that bleeding following a skin incision or incision into the liver is quickly checked by the local application of these preparations, and that when it has been given intravenously, for example, 2 c.c. of a 10 per cent. solution injected into the ear vein of a rabbit, it has been possible to shorten the coagulation time by one half. In human beings we have had only a very limited experience with this thromboplastin given intravenously, having as yet confined ourselves mainly to its local use. Recently it rendered most welcome service when applied locally in two cases of hemophilia. One of these cases, a boy aged about 9 years, who has been under our observation for a year or more, was sent to the hospital on account of bleeding from the tongue which he had bitten while playing. As is so

frequently the case in hemophilia, the bleeding was a mere oozing, which at first appeared to be of insignificant importance; it continued unchecked, however, in spite of the local application of fibrinogen, pure thrombin, calcium solution, gallic acid, serum and coagulose. The last-named preparation, as well as horse serum, was also injected subcutaneously, but without effect. After the boy had been bleeding almost continuously for four days, as he manifested increasing anemia and his pulse was becoming weak and his general condition critical, it was decided to obtain a donor and perform a transfusion on the following day. On the evening in question, however, as a last resort, a preparation of tissue extract was made from a uterus which had been removed in the operating room that very day. This was applied locally with almost instantaneous effect; the bleeding ceased and did not recur. In the test tube, the addition to blood of this tissue extract, which in the laboratory we have termed "thromboplastin," brings about coagulation with almost explosive rapidity. In the case of oxalated plasma (calcium must also be added), the clotting proceeds so quickly that no fibrin threads can be seen in the transparent clot. It is therefore to be expected that a substance with such properties would be especially indicated in hemophilia—a disease in which the primary, if not the entire defect, consists of a delay in the coagulation of the blood.

A second case bore out this supposition. This concerned a boy about 5 years of age, a marked bleeder with a pronounced family history of bleeding. The coagulation time of his blood had frequently been found to be remarkably delayed; ten drops at times took over three hours to coagulate in a small flat-bottomed tube. One day last December he began to bleed from a tear of the frenum of the tongue, and after various hemostatic measures had been resorted to in vain, he was referred to the Research Laboratory. There was found to be a soft clot incompletely covering the wound, from which there was slight but continuous oozing. On removal of this clot, the blood flowed more freely. Thromboplastin was applied on cotton for a few minutes, with the result that the bleeding ceased at once and did not recur.

These two cases seem to establish the value of thromboplastin in hemophilia. It remains to be ascertained whether it will be of value in purpura, a condition so frequently confused with hemophilia, but which is not characterized by a greatly delayed coagulation time, but by a marked decrease of platelets. It has been effective in controlling hemorrhage when the blood is normal, for example, after tonsillectomy, and therefore may be found of value in checking the bleeding which so frequently disturbs the operator in the surgery of the nose, brain, the abdominal organs, etc. When given intravenously, thromboplastin may prove to be of aid in checking various acute internal hemorrhages which are the result of ulceration or rupture of the vessel walls.

16 West Eighty-Sixth Street.

Failure to Meet Liabilities Means Bankruptcy.—Sick people are an expense to the state, whether the expense be borne by the state or by individuals, for the wealth of the state is but the aggregate wealth of its people, and any state that will not assume the duty of caring for the public health will fail in its competition with other states.—H. L. Sutherland, *Bull. Mississippi State Board of Health*.

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