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Responsible Investigators: Wm. P. Longmire, Jr., M.D.; Jack A. Cannon, M.D.; Robert A. Weber, M.D.

University Department: Surgery

Financial Support 1954-55: None.

Title of Project: Studies of Cellular Growth in Infantile and Adult Tissue under Atypical Environmental Conditions.

Work in the tissue transplant laboratory has been somewhat curtailed during the past year by the military leaves of absence of the two principal investigators, and the resulting lapse of financial support. Nevertheless, the following information has been gained:

1. Successful cross-grafting of skin in chicks is possible only in the first seven days after hatching. However, if skin from donor chicks of different ages is grafted onto one day old recipient chicks, an incidence of survival of the cross-grafts is obtained only when skin from donor chicks no older than 14 days is used. It thus appears that tissue specificity factors are imparted to the skin at a slower rate than to the organism as a reacting unit. This phenomenon would indicate that tissue specificity factors may come from the infusion into the cellular structure of the organism of some specific agent produced in some central system.

2. A large series of re-grafting experiments has been completed (see Ref. #3). When a cross-graft

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which has survived into adult life is transferred back to its original donor, the graft occasionally survives but reaction and slough may also occur indicating that the graft is no longer compatible with the individual to whom it originally belonged. It has also been found and confirmed that a repeat skin grafting operation between the same adult donor and recipient is rarely successful even though the host is bearing a healthy graft obtained from the same donor and grafted onto the same host when the pair was one-day-old. Thus, compatibility between host and donor, when present, is almost always transient, and the tissue specificity of given cells appears to be alterable. In some instances where the homograft is successful the graft appears to lose the tissue specificity of its donor and assume the tissue specificity of the host.

3. Work has been initiated to discover whether the phenomenon present in the chick is also present in higher animals. The purpose of this work is to test the hypothesis that tissue specificity may be relatively lacking in fetal or infant individuals. It has been found possible to anesthetize a pregnant rabbit about one week before term, open the uterus, and perform cross-skin grafts between two of the fetuses. The wounds are closed and the grafted fetuses are allowed to go on to delivery. To date several viable grafted fetuses have been delivered.

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The mortality is high, however, and as yet we have been able to raise only one such grafted pair. Unfortunately, the grafts on these did not survive. The method is believed to have possibilities and work with it continues.

Publications:

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