detect others across the smaller depleted area. We have under way several more extensive and refined experiments designed to elucidate the above hypotheses, as well as to provide data on some variables not discussed here.

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Heterotransplantation of Human Tumors Into Cortisone-treated Rats

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Ever since the experiments of Murphy, starting in 1914 (*1*), the role of the lymphocytes of the host in the resistance to heterotransplantation has been the subject for intensive investigations. The production of antibodies by lymphocytes has been established (*2*), and the release of immune γ-globulin from lymphocytes demonstrated (*3, 4*). Murphy observed the persistence of transplanted mice tumors in x-irradiated rats (*5*). Recently it has been shown (*6*) that large doses of x-ray to rats and mice make these animals receptive to heterotransplantation of human tumors, and successive transplantations were carried out. The success of this experiment, as of those of Murphy, was related to the reduced lymphocyte counts of the irradiated animals. Prior to this experiment, transplantation of human tumors was successful only when it was carried out in the anterior chamber of the rabbit eye (*7, 8*).

As the administration of cortisone results in a greatly reduced lymphocyte count, heterotransplantation of human tumors in cortisone-treated rats was attempted. It was found previously by Foley and Silverstein (*9*) and by Howes (*10*) that the strain-specific resistance to transplantation of tumors in mice is greatly impaired by treatment with cortisone.

Biopsy material of human tumors was transplanted. Generally no more than 10–15 min elapsed between the removal of the tumor, establishing of the diagnosis by frozen section, and transplantation of the tissue into cortisone-treated rats. The tumor was cut into small fragments and transplanted, by the use of a trochar (1–2 mm diam), subcutaneously into the left inguinal region of 3 or 4 treated rats. The pretreatment of the rats varied because of the irregularity of the receipt of suitable material from the operating theatre. As rats had to be kept prepared, the number of injections before the transplantation varied between one and four. Young Wistar rats, mostly females, at the age of 4–6 weeks, were used. The rats received 25 or 12.5 mg of aqueous suspension of cortisone acetate subcutaneously at 2- or 3-day intervals. No untoward effects were manifest in the rats except for retardation in growth. Nine tumors were transplanted. Table 1 shows the origin of tumors transplanted and the results. Photomicrograms of tumors are given in Figs. 1 and 2. Rats were killed 4–21 days after transplantation, but as a rule after 8 days. The skin and muscle around the transplant were examined, and any nodules found were studied histologically. With the exception of one rat, killed 4 days after transplantation, no inflammatory reaction was found around the transplant. The survival of the transplanted tissue was judged by the size of the transplant, by the healthy occurrence of the tumor cells, and by the presence of mitoses in the sections. Reliable evidence for growth are the mitoses found several days after transplantation. The size of the transplants increased during the days following transplantation and was 4–5 times that of the original size after 10–14 days. The increase in size alone, however, cannot be taken as a measure of the growth of a transplant, since fibroblastic proliferation of the host tissues may also participate. No serial transplantation was attempted. Out of 9 tumors transplanted into 28 rats, positive results were obtained with 8 tumors in 14 rats. A carcinoma of the kidney was the only tumor not transplantable to any of the rats. This tumor was heavily infected. None of the tumors grew in all rats to which they were transplanted; the highest take was 3 out of

TABLE 1

Tumor transplanted	No. of rats	No. injections before transplantation	No. injections after transplantation	No. of successful transplants
Cancer of bronchus	4	2	3	1(4)* 1(12) 1(16)
Cancer of breast	3	4	2	1(8)
Metastasized lymphnode cancer of bronchus	3	2	2	2(13)
Cancer of breast	3	3	3	1(10)
Juvenile melanoma	3	4	3	2(8)
Cancer of breast	3	1	4	1(12)
Cancer of esophagus	3	3	3	2(8)
Cancer of kidney	3	2	3	0(7)
Ependymoblastoma	3	3	3	2(12)

* Figures in parenthesis represent the days after transplantation at which the rats were killed.

4 rats. The tumors seemed to regress 19–20 days after transplantation. A transplant of a bronchogenic carcinoma investigated 21 days after transplantation showed marked fibrosis and only a few degenerating tumor cells. Also, no inflammatory reaction was seen around this transplant. Two other transplants of the same tumor were found persistent in rats killed 8 days after the transplantation. Transplants into one group of rats not treated with cortisone was unsuccessful.

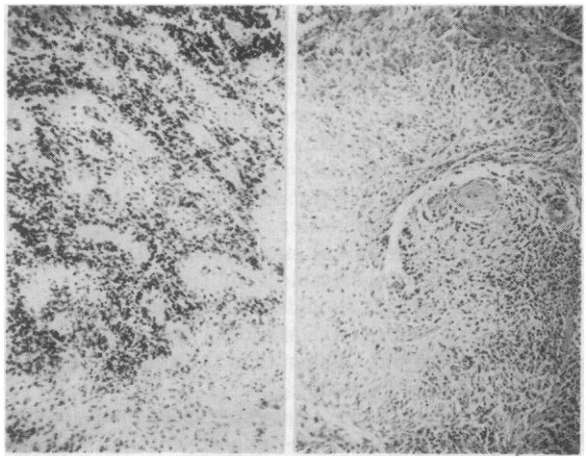

FIG. 1. Ependymoblastoma: Left, original tumor, ×70; right, transplant 12 days old. Note mitosis.

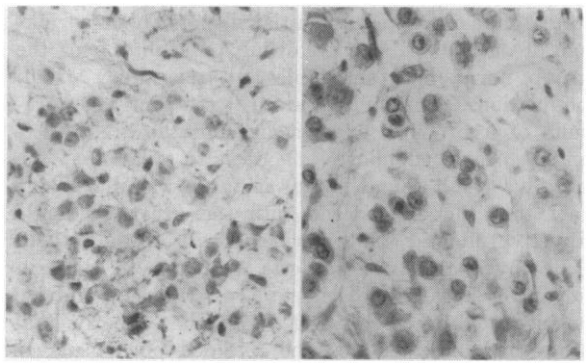

FIG. 2. Bronchogenic carcinoma: Left, original tumor, ×300; right, transplant 12 days old. Note mitosis.

In two rats with successful grafts, blood counts of the heart blood were made at the time each animal was sacrificed. The total blood count in one rat was 1900 leucocytes, with 10% lymphocytes; in the other, the count was 1900 leucocytes and 7% lymphocytes. The number of leucocytes in normal rats is 12–15,000, with 65–75% lymphocytes. The red blood cell count was about normal.

Other changes found in cortisone-treated rats were the reduction in the size of adrenals, spleen, and thymus. In the spleen a very marked increase of the giant cells was observed. An increase in the number of splenic giant cells after transplantation of chemically induced tumors in mice was studied by Parsons *et al.* (*11, 12*). In 4 rats, killed 9–14 days after transplantation, marked dilatation of the pelvis of the kidney was found, and in the histological preparation a corresponding dilatation of the collecting tubules was observed. In all rats, a marked development of the mammary tissue was found. The ovaries contained ripening follicles, but no corpora lutea.

It is as yet impossible to state whether the survival of human tissue transplants in rats is directly connected with the disappearance of lymphocytes of the circulation or whether a disturbance occurs in the whole cellular metabolism of the cortisone-treated animals. It was not attempted to establish in which percentage of all tumors heterotransplantation might be successful, or which kind of tumors are more suitable for transplantation. The aim of this study was to show that cortisone changes the inner environment of an animal in such a way that its resistance to heterotransplantation is greatly diminished.

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Conformity to Social Norms in Stable and Temporary Groups[1]

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When members of small face-to-face groups, whose structure had facilitated verbal interaction, were confronted with a green rectangle and asked to estimate its length anonymously, the dispersion of their perceptual judgments was significantly greater than the dispersion of estimates from groups whose structure had tended to inhibit such interaction (*1*). Further, when the individual estimates and their average or norm were presented to each group, respectively, and members were asked to re-estimate the length of the rectangle anonymously, a significantly greater reduction in dispersion of estimates compared to the initial

[1] This work was undertaken in the summer of 1949 as part of the Conference Research Project at the University of Michigan, sponsored by the Office of Naval Research (Contract N60nr-232. T.O. 70), under the general direction of Donald G. Marquis, chairman of the Department of Psychology.

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