

The X-ray powder diffraction patterns were identical. The molecular weight was 201.0 as calculated from X-ray diffraction data.

Analysis: $C_{11}H_{16}O_2NP$ (199.1)
 Calculated C 24.1 H 5.06 N 7.04 P 15.6
 DL-Phosphothreonine 24.0 5.13 6.89 13.4
 L-Phosphothreonine 24.9 5.19 7.03 14.0

The phosphorus was determined by Teorell's method⁵. The low figures seem to be due to difficulties in hydrolysing.

These facts seem to indicate that the phosphoric acid in casein is bound not only to serine, but also to threonine.

A full account of this work, which was sponsored by the Swedish Medical Research Council, will appear elsewhere.

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¹ Ljpmann, F., *Biochem. Z.*, **262**, 3 (1933).

² Ågren, G., de Verdier, C.-H.; and Glomset, J., *Acta Chem. Scand.*, **5**, 324 (1951).

³ Partridge, S. M., and Brimley, R. C., *Biochem. J.*, **49**, 153 (1951).

⁴ Plimmer, R. H. A., *Biochem. J.*, **35**, 461 (1941).

⁵ Teorell, J., *Biochem. Z.*, **264**, 310 (1933).

Survival of Adrenal Gland Homografts in the Rabbit's Skin

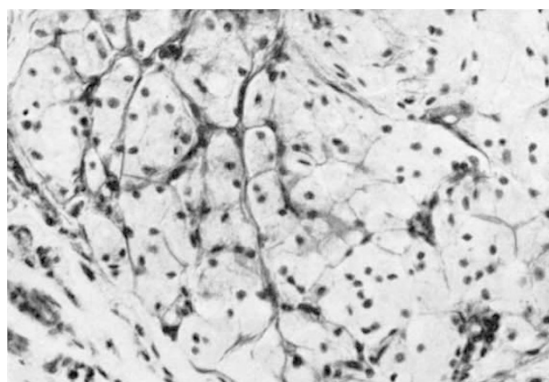
An exception to the rule that tissue homografts in non-inbred mammals survive only for a few weeks has been observed in adrenal gland grafts transplanted from one adult rabbit to the skin of another. Such grafts live for many months, and appear to succumb finally to a type of disuse atrophy rather than to the usual homograft reaction.

Slices of adrenal gland including capsule, cortex and medulla, and weighing on the average about 25 mgm., were inserted into the fascial layer of the skin of the abdomen. At monthly intervals the grafts were exposed and measured and, beginning with the second month, tiny biopsy samples were taken. The grafts gradually diminish in size from the first month onwards.

Removal of one or both of the host's adrenal glands within five weeks of grafting was not followed by any noteworthy prolongation of the life of the graft or change in its histology. The chief determinant of the length of life of the graft appears to be the size of the original transplant; the results indicate that, in general, the bigger this is the longer will the graft survive. The biggest are still alive after seven months.

The medullary tissue did not survive, the grafts being composed of a capsule surrounding a mass of polyhedral cells which resembled enlarged zona fasciculata cells (see photograph). These cells gave positive reactions to tests for lipids, phospholipines, cholesterol and vitamin C, and there was a well-developed network of reticular fibres among them. They exhibited mitotic figures in a graft removed at two weeks, and in another removed at six weeks, after transplantation, but not in older grafts. Some of the signs of a homograft reaction, namely, infiltration of lymphocytes and plasma cells, and dilatation and congestion or destruction of the blood vessels, were observed in a few specimens, but they were usually weak or localized. The majority of grafts showed none of these signs.

The cells in most grafts undergo a slow process of degeneration. Their cytoplasm enlarges and frequently develops large fat droplets; the cell bound-



Cells of an adrenal gland homograft after five months in the skin of a bilaterally adrenalectomized rabbit

aries become indistinct and cells coalesce, so that multinucleate forms are common. Pyknotic and elongated nuclei are numerous in older grafts.

This degeneration of the homograft tissue is not surprising in normal or unilaterally adrenalectomized animals. But it also occurs in bilaterally adrenalectomized animals, and since these showed no distress after the disappearance of their grafts this suggests that accessory cortical tissue may take over the function of the glands. No cortical tissue was found on macroscopic examination of the sites of adrenalectomy at autopsy. The effect of later adrenalectomy and of implantation into the deeper parts of the body is now being tested.

The chief interest of the phenomenon lies in the apparent failure of the usual homograft reaction in these grafts and the indication that, contrary to the rule with other tissues, the larger the graft dosage the longer the survival. Submaxillary gland homografts transplanted to the same site and in the same dosage were found, when examined after two months, to be completely destroyed.

These findings are also of interest in relation to the reports of successful treatment of Addison's disease by means of adrenal gland homografts^{1,2}. Lux, Higgins and Mann³ reported survival up to twelve weeks of homografts of adrenal gland from new-born rabbits and guinea pigs when the grafts were first cultured in the presence of the host's serum and then transplanted into the groin. These grafts underwent a delayed, but ultimately strong, homograft reaction.

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 London, S.W.3. May 16.

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² Goldzieher, H. A., and Barishaw, S. B., *Endocrin.*, **21**, 394 (1937).

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Oxidation of Thiophosphate Insecticides in the Rat

THE problems encountered in assessing the toxicity of the organo-phosphorus insecticides towards mammals have been reviewed in a recent article by Aldridge and Barnes¹. It was pointed out that compounds such as O-*p*-nitrophenyl O,O-diethyl thiophosphate (parathion, E 605) are considerably more potent *in vivo* as inhibitors of true cholinesterase than would be expected from their inhibitory activity *in vitro*; the summarized evidence indicated that thiophosphates