stains and their reactions; he showed that metachromatic staining depends primarily upon the presence of sulphuric acid groups attached to compounds of sufficiently high molecular weight. We have found that, owing to its solubility, hyaluronic acid is removed from tissues during fixation by ordinary histological methods, and, in order to prevent this, it is probably necessary to use some such fixative as Carnoy's fluid. It is therefore probable that the hyaluronic acid had been removed from the specimens of umbilical cord examined by Bacsich and Riddell and that the metachromatically staining substance described by them was chondroitin sulphuric acid, which Meyer and Palmer consider is a constituent of the connective tissue of the cord.

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Bacsich and Riddell[1], in their letter of March 3 on the structure and nutrition of the cornea, cartilage and Wharton's jelly, suggest that the metachromatic staining of the cornea with toluidin blue may be due to heparin or some other related compound. Jorpes, Holmgren and Wilander[2] briefly reported that a substance prepared from cornea which had the properties of a mucoitin sulphuric acid showed only a very weak heparin activity. They thought that this activity was due to the small amount of heparin extracted from the mast cells at the limbus, and that the general metachromasia was due to the mucoitin sulphuric acid. Meyer and Chaffee[3] have since isolated a mucoitin sulphuric acid from ox cornea and shown that it is the mono-sulphuric acid ester of hyaluronic acid, the sulphate-free polysaccharide which Meyer and Palmer[4] had isolated from Wharton's jelly and vitreous humour. They found that it is present in the cornea in a concentration of at least 1·8 per cent. They failed to isolate mucoitin sulphuric acid from the sclera, which shows no metachromasia.

A sample of ox cornea mucoitin sulphuric acid (ester sulphur 4·1 per cent) was very kindly tested for heparin activity for me by Dr. MacIntosh and found to be inactive. MacIntosh[5] compared the anticoagulant activity of various heparins and other sulphur-containing polysaccharides with their reaction with toluidin blue. He found that the two properties ran roughly parallel, mucoitin sulphuric acid having a negligible heparin activity and a colour value with toluidin blue of about 1 per cent that of the purest heparin. In spite of the relatively weak reaction between toluidin blue and mucoitin sulphuric acid, the concentration in the cornea is ample to account for the diffuse metachromasia. A 0·003 per cent solution of ox cornea mucoitin sulphuric acid gives an easily visible purple colour with dilute toluidin blue. There seems therefore no need to invoke heparin or some unknown substance to explain the metachromatic stain of the cornea substantia propria.

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Spontaneous Transmissible Tumours in the Syrian Hamster

SINCE 1930 a large number of Syrian hamsters have been bred in the Hebrew University, mainly for work on kala-azar. All the animals originated from a single family and have been distributed to laboratories to various parts of the world. A record of spontaneous tumours in Syrian hamsters is therefore of general interest.

During the last seven years, we have noted thirteen instances of spontaneous tumours among a thousand animals, which were carefully examined since they had been used for experimental work on leprosy. In one case a polymorph sarcoma was found. This tumour has been passaged twenty-five times during the last three years by grafts, by inoculation of macerated tumour and by heart blood. It metastases in lymphatic glands, liver, spleen, kidney, stomach, intestines, muscles, testes and ovary. It is not transmissible by filtrates of macerated tissue. Inoculated animals survived up to five months in the first ten passages and up to two months in subsequent ones.

Another polymorph sarcoma, also freely metastasing, was observed, and thirteen passages have been noted in sixteen months. Inoculated animals survive up to three months.

A carcinoma was discovered embedded in pancreatic tissue and was found to be readily transmissible and metastasing in lymphatic glands, kidneys, testes, spleen, pancreas, liver and lungs. Six passages have been obtained during twenty months. The majority of inoculated animals survived up to five months but a few lived up to one year.

Cortical hypernephromas (in the adrenals) have been observed in ten animals during the last seven years; but only two have proved transmissible by subcutaneous and intraperitoneal grafts. From one tumour five passages have been obtained in four years, and from another two passages in eighteen months. Minute metastases were found in the pancreas, lymphatic glands and suprarenals but longevity was not affected.

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