infection with X-irradiated metacercariae will influence the course of normal infection in mice and rabbits.

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Development of Transplantation Immunity in the Regionalized Lymph Node following Extirpation of the Original Regional Lymph Node

THE extirpation of the regional lymph node doubles the survival-time of a cutaneous homograft on the ear of a rabbit^{1,2}. If we perform an indirect colour lymphography before and after extirpation, we can observe a further node which is connected to the lymphatic system within 2 weeks and which previously did not belong to this collecting area³.

We have tried to verify whether this regionalized node is a source of transplantation immunity. To this end, we made use of the fact that the cells of a regional node and a cutaneous graft against which the node was immunized, grafted on various sites of the same ear of a rabbit, produce a considerable oedema of the ear within 48 hr.⁴.

The experiments were carried out on Chinchilla rabbits weighing 1,800–1,900 gm. In the control group a 2 cm. × 2 cm. full thickness cutaneous homograft was transplanted on the ear of the rabbit. One week after rejection of the graft (it survived about 11 days) the regional lymph node was extirpated after indirect colour lymphography and transplanted on the ear of another rabbit. Over it a cutaneous graft was transplanted against which the node was immunized. 48 hr. later both ears were weighed. In the second group the regional lymph node was extirpated simultaneously with the cutaneous grafting. Again a week later, after rejection of the graft (it survived 25 days on the average), the regionalized lymph node was extirpated after indirect lymphography and together with the respective graft it was transferred to the ear of a further rabbit. In the third group an experiment similar to that of the control group was performed, with the exception that we extirpated the preauricular node which, in this case, was not a regional one and therefore not immunized against the graft.

Table 1. OEDEMA OF THE EAR 48 HR. AFTER TRANSPLANTATION OF GRAFT AND LYMPH NODE CELLS IMMUNIZED AGAINST THIS GRAFT

	Weight of ear (gm.) after 48 hr.	
	Control side	Influenced side
Regional node and graft	15.1 ± 1.5	32.2 ± 2.7
Regionalized node and graft	15.8 ± 1.4	30.7 ± 2.5
Non-immunized node and graft	15.7 ± 1.9	16.4 ± 1.8

The results are summarized in Table 1. After transplantation of the regional node and of the respective graft a considerable oedema developed so that the weight of the ear doubled compared with that of the non-influenced one. Similarly, after transplantation of the node regionalized following the extirpation of the original regional node and the

transplantation of the respective graft, a considerable oedema occurred and the weight of the ear doubled again. If we, however, transferred the preauricular node which was not regionalized because the original retroauricular node was intact, no oedema occurred after transplantation of the respective graft.

This leads us to presume that the node which is connected to the lymphatic system after the extirpation of the original regional node becomes one of the sources of transplantation immunity.

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Coccolith Formation

WITH the application of culture methods to the study of coccolithophorids, evidence is now accumulating¹ in favour of the older hypothesis that coccoliths are formed inside the cell. This hypothesis has recently received further support from electron microscope investigations of other types of scale-bearing Chrysophyceae². So far, however, the process of coccolith formation does not appear to have been studied by experimental means.

In young cultures of *Coccolithus huxleyi* (Lohm.) Kamptn., I have on numerous occasions observed one (Fig. 1) or two coccoliths in the cytoplasm between the two chromatophores. Their actual liberation has not been observed, but the following experiment suggests that the average time needed by the cell to produce a new coccolith may be less than 1 hr. Cells were grown in a medium of sufficiently low calcium content (0.01 gm. calcium/l.) to prevent coccolith formation entirely, and were afterwards transferred to sea-water and exposed to light. During the next few hours, various stages in the development of a coccolith cover could be observed. Single coccoliths were seen inside cells that were either still completely naked or carried one or more external coccoliths. After 6 hr., the majority of cells had produced 5–10 coccoliths.

By means of volumetric calcium analysis and simultaneous coccolith counts, it was found that the calcium content of one *Coccolithus huxleyi* is 5.5×10^{-13} gm. calcium. Assuming a cell radius of 2.5μ , an organic carbon content of 0.1 gm. per c.c. of

Fig. 1. Coccolith (indicated by arrow) inside cell of *Coccolithus huxleyi* (phase contrast, $\times 4,000$)