

work. So far as memory serves us he was an assessor in the Admiralty Court, and had to read documents and interpret maps and plans. His age was 68 years and he was due to retire in eighteen months' time. If he could continue at his work till he was 70 years of age he would retire on a small pension; but if he retired before 70 then he got no pension. Here was a pretty problem. We pointed out to him that, in view of the changes in the fundus of the eye we could examine, an operation for cataract was a more risky procedure than usual and that even if the operation were successful we could not promise that the fundus of the right eye would not show signs of disease as in the left. He said he quite understood this; in fact the uncertainty and possible failure had been insisted on by another ophthalmic surgeon whom he had consulted. But the latter had professed his willingness to undertake the risk and he hoped that we would be able to help him. Naturally we asked why he had not kept with his previous consultant, and then it came out that the question of fees was the stumbling block. Machaon's lowest fee was beyond the means of him whom we will call Binnacle, though it wasn't his name.

The operation was performed at Binnacle's own home and no untoward event occurred. During the post-operative week he got a sharp attack of gout in his big toe, from which we augured that the eye would do well. It did, and he got 6/9 vision with his glass and was able to complete his service and take his pension. A few years afterwards he had a slight stroke and asked us to go and see him as his sight had failed. He thought that perhaps a needling operation would restore it, but on examination the fundus was affected as that of the other eye and we had to tell him that no further operation would be of any use. We heard that he died not long after this. In this instance the result justified the risk, but we should not have cared to undertake many such cases.

ABSTRACTS

CONJUNCTIVA

- (1) **Rodin, F. H. (San Francisco).—Bacteriologic study of human conjunctival flora.** *Amer. Jl. Ophthal.*, Vol. XXVIII, p. 306, 1945.

(1) Rodin gives an analysis of 152 patients in whom bacteriological investigation of conjunctival scrapings was made. The scrapings were taken from the palpebral and bulbar conjunctiva by a platinum spatula. These were stained with Giemsa and by

Gram's method. Part of the scrapings was inoculated into media composed of Difco proteose peptone (No. 3) and 5 per cent. rabbit's blood. Cooked blood agar was used for promoting the growth of haemoglobinophilic bacteria. Anaerobic bacteria were cultivated in tubes of thioglycolate broth and also on blood agar in spray dishes. Corneal agar served for the growth of fungi.

To permit bacteriostasis of a variety of Gram-positive bacteria conjunctival scrapings were diluted serially and exposed for 10 to 15 minutes to the action of an aqueous solution of 1 to 20,000 to 1 to 40,000 crystal violet.

Animal inoculation into the scarified cornea of a rabbit was used for the detection of the herpes virus. Complement fixation tests were done in cases of gonococcal infection and lymphogranuloma venereum.

The organisms most commonly found were staphylococcus aureus and albus, haemolytic and non-haemolytic, toxigenic and non-toxigenic, and diphtheroids.

H. B. STALLARD.

(2) **Loewenstein, A. (Glasgow).—Trachoma virus and the morphology of inclusion bodies:** *Amer. Jl. Ophthalm.*, Vol. XXVIII, p. 282, 1945.

(2) In advanced trachoma the follicles consist of lymphocytes, plasma cells, fibroblasts and macrophages. The last do not contain inclusion bodies. Metachromatic granules were found in plasma cells. The appearance of the inclusion bodies differs in scrapings and sections. In scrapings they show polymorphy and individual elementary and initial bodies may be found alone in the cells.

In sections encapsulated inclusion bodies with many Giemsa-staining elements are found in the superficial epithelial layers. In the middle layers the encapsulated inclusions tended to be smaller with fewer elements. Groups of elements lying free in the epithelial plasma without either capsule or halo may be the virus itself as well. No encapsulated colonies were seen in the deepest layers of the epithelium. In the middle and deepest epithelial layers single reticulum cells full of metachromatic granules were present.

In the subepithelial tissues reticulum cells of fibroblast character were filled with blue and purple granules. The size varied but many were equally sized and equal to that of the intra-epithelial elements. Granules were free in the tissues, some single and others in colonies.

The diseased tarsus was found to be full of reticulum cells of fibroblast character with blue and purplish elements in large numbers both inside and outside the cells. Similar granules were not found either in the lymphocytes or in the plasma cells.

It is possible that both the intraplasmatic Giemsa-staining elements in the reticulum cells and the extra-cellular elements are the virus itself.

A letter to the editor of the *Amer. Jl. of Ophthal.* appears in the June number (p. 672) from Thygeson whose important researches have done so much to elucidate the problem of trachoma aetiology. This letter originates from a perusal of Loewenstein's article of which the author's summary, somewhat condensed, is given above. Thygeson reminds readers of published work not alluded to in the article.

Trachoma virus is a member of the psittacosis, lymphogranuloma-venereum group of viruses, a group about which much is known, particularly as to the elementary body—initial body cycle of morphologic variation which is characteristic only of the inclusions of this group. There can be no doubt that the initial body represents the early intra-cellular phase of the virus and the elementary body the late intra-cellular phase.

Inclusions indistinguishable from trachoma are found only in inclusion conjunctivitis among conjunctival diseases, a related virus disease which is also a member of the psittacosis, lymphogranuloma-venereum group. We now know that inclusion blennorrhoea, swimming-bath conjunctivitis and acute follicular conjunctivitis with inclusions are one aetiological entity.

Trachomatous inclusions are found in the epithelium only; sub-epithelial changes are believed to be produced by the liberation of soluble toxic products, a theory strengthened by the fact that soluble toxic products have been demonstrated for the related viruses of lymphogranuloma venereum, meningo-pneumonitis and mouse pneumonitis (Rake and Jones, *Jl. Exper. Med.*, 1944, Vol. LXXIX, p. 463).

The demonstration of a carbohydrate matrix for the inclusion body by Rice (*Amer. Jl. of Ophthal.*, 1936, Vol. XIX, p. 1), is of capital importance.

Studies of the closely related virus disease inclusion conjunctivitis has shed much light on the trachoma inclusion, since in this harmless disease many human inoculations have been possible. Thygeson demonstrated that the inclusion body requires about 48 hours for its intracellular development, a finding which is identical with the finding in psittacosis and is probably applicable to the inclusions of the entire group.

A. F. MACCALLAN.