

SOME REMARKS *on the NERVES of the CORNEA of the RABBIT and FROG.* By H. N. MOSELEY, B.A., Radcliffe Travelling Fellow. (With Plate XIII.)

GOLD preparations of the cornea after they have been in the cabinet for five or six months in a glycerine mount, generally turn dark and very often lose their transparency so thoroughly as to become apparently spoiled. It will be found, however, that from such specimens really beautiful preparations can often be obtained. After this long maceration in glycerine, the cornea can readily be torn into a series of extremely fine layers, so fine, indeed, as in the case of the frog, to be only one cornea-corpuscle thick. As the nerves continually get darker and darker by the further reduction of the gold chloride, these thin layers are extremely instructive with regard to these nerves generally, and especially with regard to their relation to the corpuscles, which it is extremely difficult if not impossible to determine when several layers of corpuscles with the surrounding nerves are in the field at once. Although so much has been written on the subject of the nerves of the cornea, it is hoped that the following remarks and accompanying drawings may not be without interest.

Schweigger Seidel in his exhaustive essay on the structure of the cornea in 'Ludwig's Arbeiten,' has figured the points of junction of the larger nerves of the frog's cornea, and has described them as resembling in some degree those of Auerbach's plexus. Those from the cornea of the rabbit have, I believe, not yet been figured, though they are far more complex in internal structure than those of the frog. This structure is only to be seen to advantage in very fully stained preparations which have been macerated in glycerin for some time and then separated into fine layers. The separate fibres of each plexus thus come into view. Two of these are figured in the plate (Plate XIII, figs. 1 and 2), having been drawn with a camera lucida. It will be observed that every branch of each plexus has connecting fibres which connect it with each of the other branches. As the branches are given off in an irregular manner, the plexus thus assumes also an irregular form. The two figured are selected as good typical examples. There are commonly in each plexus two or three fine fibres which do not pass through the general mass, but take as it were a short cut from one branch to another. There are nuclei in each plexus, but they are no longer visible in preparations such as those which

are intended only to show the peculiar arrangement of the fibres.

It is still a question among histologists whether the nerves in the body of the cornea are in connection with the corpuscles. Kühne first described this connection. Kölliker is opposed to him, and Engelmann has observed such a connection in very few instances. On examining a preparation of the cornea in which the nerves are well stained as there figured (fig. 4), it appears at the first glance as if anastomoses between nerves and corpuscles occurred in all directions, it is only after carefully tracing the fibres one by one that such is found not to be the case. The fibres nearly always pass either under or over the processes of the corpuscles. Still there can be no doubt that in gold preparations a direct continuity is to be observed between the substance of the corpuscles and that of the nerves. Such, however, occurs, as far as I have been able to observe, very seldom. No certainty can be arrived at, unless a very thin layer not more than one corpuscle thick be examined, so that no deception may occur from superposition. Two corpuscles from such a preparation are figured (fig. 3); they are from the cornea of *Rana esculenta*. There can be no doubt here about continuity of substance, and the appearance is the same when the preparation is examined with very high powers. If Schweigger Seidel's view as to the post-mortem nature of the corpuscles be correct, it naturally follows that such connection as this is also an artificial production due to the reagents employed. It is merely here contended that an actual connection between corpuscles and nerves is to be seen in gold preparations of the cornea, a fact doubted by many observers. The nerve in connection with a corpuscle is not by any means one of the finest twigs. In the same preparation is another case in point in which the nerve is much finer. The present example is merely chosen because it is so very distinct.

Figured also in the plate (fig. 5) is one of the finest nerve-fibres from the front of the cornea of *Rana esculenta* just below the epithelium. Kölliker mentions the varicose appearance of these fibrils as seen in gold preparations. As their appearance is very remarkable, a drawing of them is given as seen under $\frac{1}{12}$ immersion of Gundlach. The varicosities are so regular that there must be some structural peculiarity which causes them to assume this form under the action of the reagents. I have not noticed anything very similar in other fine nerve-fibres when treated with gold.