Dr. Bond be thanked for his paper; and that it be remitted for consideration to a committee. That the said committee be requested to report to the next Annual Meeting upon the present statistical tables of the Association as to whether, and if so in what direction, their alteration or amplification would be of advantage; that individual members of the Association be hereby invited to communicate to the committee any views they may have on the subject; and that such committee consist of Drs. Rayner, Hyslop, Whitwell, Stewart (Glamorgan), Bond, Yellowlees, Easterbrook, Nolan, Dawson, and Bedford Pierce; that Dr. Yellowlees be appointed Chairman, and Dr. Bond Secretary; that the quorum be three, and that the committee have power to fill any casual vacancy." These names have been very carefully chosen as those of gentlemen in every way competent to deal with the subject.

Dr. RAYNER.—I have great pleasure in seconding the resolution. We are indebted to Dr. Bond for having taken up this subject, and bestowed upon it so much time and attention. I shall be happy to be associated in carrying out the object he has in view. I suggest that the Treasurer's name be added to the others.

The resolution, as amended on Dr. Rayner's suggestion, was passed unanimously.

Observations on the Neuroglia Cell and its Processes.(1)

By R. R. LEEPER, F.R.C.S.I.

I WISH to-day to direct the members' attention to the neuroglia cell and its processes, although time does not permit me to do more than refer in the briefest manner to the present state of knowledge respecting the subtle relationship of the changes of these glia cells to insanity.

Neuroglia-cell change is as constantly found in the brains of the insane as are the other cellular chromatolytic and vascular pathological appearances with which we are familiar. The glia changes are, however, less readily seen, and require a somewhat more careful and painstaking study to demonstrate their diseased appearances than one is accustomed to give to the examination of the other cortical and medullary structures. Great, however, is the importance of the study of these changes and appearances, both in the normal and pathological brain. The normal function of these neuroglia cells is not clearly, if at all, understood, and I, for one, whilst admitting that much of what has been written may be correct, believe that the vibration of each ventricular systole finds one of its most distant and delicate expressions in the fibrillary network of the neuroglia, and these cells by their inherent elasticity serve

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not alone as a mere mechanical support, but as the vaso-motor mechanism of the higher centres of the brain, protecting them from sudden toxic action, isolating and cherishing them by physiological forces of which we may but dimly discern the purpose, and can but conjecture as to the means of their morbid or beneficent action. It may yet be possible to accord to the glia cells and their processes all the power and complexity of function which Cajal has claimed for them. One wonders at the frequent presence of pigment granules in all large nerve-cells of men and animals, and it seems to me a matter beyond conjecture that this pigmentary substance is essential to normal nervous function.

What, then, is the interpretation of the presence of these pigment granules in and around the neuroglia cells? Is it the crude substance we see around the neuroglia, and is the filtrate seen deposited in the neuron itself, or is this circular pigmentary precipitate in the neuron to be excreted *viâ* the vascular and intercellular processes of the glia cells? or, again, is this yellow granular pigment a kind of intercellular storage battery to be used alike by neuron and glia in the development of nervous force? The pigment grows more noticeable as the cellular structures grow older and require a stronger stimulus to excite them to a functional activity. Is this pigmentary substance, in short, an accessory to normal nervous cerebral function, or are we to regard it as a sort of intra-cranial stigma of degeneration, only appearing in cells whose functions are no longer capable of the highest activity, but still in some way necessary to their declining lives? The processes of the neuroglia cells closely resemble the flagella of certain motile bacteria, and are stainable by the same histological methods; and in connection with this fact it is well to remember that Spina and Vejnar have observed glia cells in movement, also a cilia-like motion of their reticular network in the living frog.

The sclerosis of the brain differs from that of all other tissues in that there is little contraction of the affected area, a fact which must be due to the elasticity and adaptability of the replacement tissue, which we know to be largely made up of proliferated and hyperplastic neuroglia cells; this shows that the neuroglia cell must possess a higher organisation than that of its ordinary fellow-worker in the connective tissue of other parts of the body, and I feel sure that its motorial and contractile

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powers will be fully verified as we gain more knowledge of its function.

No part of the neuroglia cell is more constantly looked for or better worthy of our attention than the so-called vascular process of Bevan Lewis. One frequently sees this process apparently in contact with an endothelial cell in a capillary wall, or attached to the vascular canal between the endothelial cells.

If a fine fibrillary network is always interposed between the termination of this process and the capillary wall, it is easy to understand the powerful effect which contractility of this process must have upon the cerebral circulation, and the hypertrophy of this process in morbid brains must have some direct pathological significance.

Again, this process may be the excretory channel for the products of cellular decomposition, the particles of chromatolysed nerve-cells finding their exit from the cortex by means of these octopus-like tentacular processes of the glia cells; or the converse may be the case, and we may find that the lymph is absorbed from the pericellular and perivascular spaces by these cell-endings and conveyed centripetally by these means for the nourishment of the glia and its dependants, to be subsequently passed into the neuron itself if the neuroglia exercises a trophic influence upon the nerve-cell.

In conclusion I wish to remark upon the importance of examining these cells as soon as possible after death, as they, in common with the other cellular structures in the cortex, rapidly manifest cadaveric change, and then examination is liable to give results of little value if not quickly fixed in a suitable fluid. My object in bringing these facts before you to-day is to endeavour to emphasise the importance of the study of these cells and their processes, and to notice the *rôle* which they play in cerebral function, morbid and normal; and I feel sure that increased knowledge of their structure and physiological function must mean a great gain to neurological science.

(1) Read at a meeting of the Irish Division of the Medico-Psychological Association in Dublin, May 23rd, 1902.

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