Levensbericht van

Lord Adrian

(30 november 1889–4 augustus 1977)

door W. Storm van Leeuwen

Edgar Douglas Adrian was born in London in 1890, where he spent his youth until he started his studies in Cambridge as an undergraduate at Trinity College. This College played a major role throughout his entire life. In 1913 he obtained a researchfellowship at this College on basis of a brilliant thesis on nerve conduction. After having finished his medical studies he returned to Cambridge, where he became fellow of Trinity College. From 1951–1965 he was Master of this College and there he lived after the death of his wife, Hester Pinsent, in 1966, until a few weeks before he died.

Even as a young man at the beginning of his scientific career Adrian exhibited the thoroughness and brilliance which characterized his work throughout his entire active life unto old age. And even at that early age he had a relativating attitude towards it. This was expressed tersely in 1915 by Dr. Drysdale of St. Bartholomew's Hospital in London when recommending Adrian for a post on the Resident Staff at the National Hospital by the following closing sentence of his recommendation letter: „His attainments are equalled only by his modesty".* This sentence constituted a characteristic of Adrian throughout his entire life. Even when obtaining, quite rightly, the sort of honours of which even the most eminent scientist may only dream, as there were the Order of the British Empire, the Nobel Prize (1934), the peerage (1955), Master of Trinity College, Chancelor of the University of Cambridge, President of the Royal Society, Chevalier of the French Legion of Honour, many honorary doctorates and innumerable lesser honours, he never lost this modesty and this sense of relativity. This is illustrated well by the following sentences, taken from his Nobel Lecture in December 12, 1932. Mentioning his revered teacher and predecessor Keith Lucas he said:
„A few years later I had the good fortune to work with him, to appreciate his technical skill and his penetrating thought. I cannot let this occasion pass by without recording how much I owe to his inspiration. In my own work I have tried to follow the lines which Keith Lucas would have developed if he had lived, and I am happy to think that in honouring me with the Nobel Prize you have honoured the master as well as the pupil".

This does not imply that he did not realize the significance of his work. He always was well aware of the crucial issues to be solved. When applying a new method to his investigations it immediately became clear to him that an entire new field

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* I am most indebted to Dr. P. Merton and Dr. W. A. Cobb for providing me with this information.

of investigation was opened. This took place when he used an electronic amplifier which he had constructed himself, connected it to a capillary electrometer for measuring electrical activities of frogs' nerves.

The incident is described vividly bij A. L. Hodgkin * who, working in the same laboratory, in the same basement and in rooms annex to those of Adrian, carried out the classical work on the properties of nerve fibres for which he himself jointly with Huxley obtained the Nobel Prize. It seems appropriate to cite here the relevant part from Hodgkin's obituary: Hodgkin describes Adrian's distress when he observed rapid electrical oscillations which appeared whenever the muscle was hanging down freely and disappeared when it was supported. Then: „The explanation suddenly dawned on me, and that was a time when I was very pleased indeed. A stretched muscle, a muscle hanging under its own weight, ought, if you come to think of it, to be sending sensory impulses up the nerves coming from the muscle spindles, signalling the stretch on the muscle. When you relax the stretched muscle, when you support it, those impulses ought to cease.

I don't think it took more than an hour or so to show that that was what the little oscillations were. I was able to make photographic records of them, and within a week I was nearly certain that many of these oscillations were action potentials coming up sensory fibres in the nerve, and what was more, that many of them came from single nerve fibres and that by some extension of the technique it ought to be possible to find out exactly what was happening in single nerve fibes when the sense organs attached to them were stimulated.

That particular day's work, I think, had all the elements that one could wish for. The new apparatus seemed to be misbehaving very badly indeed, and I suddenly found that it was behaving so well that it was opening up an entire new range of data. I'd been bogged down in a series of very unprofitable experiments and here suddenly was the prospect of getting direct evidence instead of indirect, and direct evidence about all sorts of problems which I had set aside as outside the range of the techniques that one could use. The other point about it was that, as I said, it didn't involve any particular hard work, or any particular intelligence on my part. It was one of those things which sometimes just happens in a laboratory if you stick apparatus together and see what results you get".

The comment that Hodgkin made about the last sentence is that when most people stick apparatus together and look around they do not make discoveries of the same importance as those of Adrian.

Another characteristic of Adrian was his open mindedness towards the work and the scientific aspirations of others. Even to junior- and inexperienced scientists who, like myself, were interested in problems deviating from his own main line of research he was willing to spend ample time and thought and then to give the sort of advice which may shape one's scientific career. This open mindedness is illustrated well by his attitude towards Berger's discovery that at the scalp small rhythmic potential variations may be derived, originating from the brain. Berger called these potential variations the alpha rhythm and showed that this rhythm

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* Lord Adrian 1889–1977.

A. L. Hodgkin. Nature 1977, vol. 269, no. 5628, pp. 543–544.

was reactive to brain processes such as those accompanying eye-closure and -opening. The techniques available to Berger at that time for recording these small rhythmical potential variations were not very good and just marginal for producing reasonable graphs. Berger published his observations in a psychiatric German journal not automatically available to physiologists all over the world. For this reason Berger's meticulous extensive original and in fact pioneering work did not immediately obtain the attention which it should have had. In fact his observations were unknown to most physiologists and even when known, they were not believed. It was Adrian who together with his collaborator B. H. C. Matthews repeated Berger's investigation using a mirror galvanometer designed by Matthews in combination with an electronic amplifier, which considerably improved and facilitated the recording of the small potential variations at the scalp. Adrian and Matthews not only showed that Berger's claims were entirely justified, but they also added important new information on the localization and reactivity of the brain potentials. They published their findings in the Journal of Physiology in 1934, five years after Berger's first communication, and gave Berger all credit which he so richly deserved. Adrian's standing in physiology attached as it were official acknowledgement to Berger's investigations and it was the beginning of the general acceptance of electroencephalography.

Adrian was an inspiring speaker scientifically as well as socially. He was an excellent host both to important and wellknown public persons and to students and junior scientific investigators. The attention and hospitality which Adrian gave one during a dinner at the high table at Trinity College made it an unforgettable occasion.

Finally it can be stated that Adrian was one of the very small number of scientists who have opened new fields of investigation and who have actually given direction to the development of science.