

Book Reviews

ALAN HODGKIN, *Chance and design: reminiscences of science in peace and war*, Cambridge University Press, 1992, pp. xi, 412, illus., £40.00, \$59.95 (hardback 0-521-40099-6).

Just over forty years ago a revolution in biology was heralded by a series of papers in the *Journal of Physiology* in which Alan Hodgkin and Andrew Huxley described the membrane currents across the squid giant axon, analysed the underlying ionic mechanisms and derived a mathematical hypothesis of the nerve action potential that depended upon the external concentration of sodium ions. For their work they were awarded Nobel Prizes in 1963 and both subsequently achieved a parallel array of distinctions and honours: knighthood, the Order of Merit; Mastership of Trinity College, Cambridge, Presidency of the Royal Society.

Sir Alan Hodgkin's autobiography, an extension of a brief chapter written for the centenary of the Physiological Society in 1976, now describes some of the scientific and personal background to that work. Particularly poignant is the successful experiment, in Plymouth in August 1939, when he and Huxley first recorded the potential difference across the axon membrane. Within three weeks of that achievement, Hitler invaded Poland, and the technique was abandoned for eight years whilst the young physiologists were seconded to other duties.

Those intervening years provide a substantial component of this volume, as reflected in its subtitle. Despite a strong Quaker upbringing, a visit to Nazi Germany in the early 1930s had stripped Hodgkin of his pacifist beliefs, and he was eager to enter war service, not least because a demanding job would alleviate the frustration at having to abandon his nerve experiments. After a short spell in aviation medicine, Hodgkin spent much of the war, like many other natural scientists, in radar research. His account supplements and illuminates several recent publications including *Radar days* by E. G. Bowen, whom Hodgkin thought inspiring, incisive, but shabbily treated by the authorities; and *Echoes of war* by Sir Bernard Lovell, from whom Hodgkin learned, amongst other valuable skills, the mysterious art of filling in Air Ministry requisition forms effectively.

After the war Hodgkin returned to Cambridge, teaching and tutoring students on accelerated two-year courses, slowly re-building equipment and beginning experiments on crab nerves, behaving, as his wife wrote, like a dolphin suddenly released into the open sea. With Huxley, recently demobbed from the Navy, he worked on a hypothesis about the role of sodium ions in the generation of the action potential, work terminated by the energy crisis of the winter of 1946 which made laboratory conditions impossible for the experiments. In the spring of 1947 he managed his first post war trip to the Marine Laboratory, Plymouth. Here, in a badly damaged building, with squid in short supply and unsure of his rusty experimental technique, he started testing the hypothesis more rigorously, and by July Hodgkin and Huxley were able to give a short paper to the International Physiological Congress, announcing the sodium theory of nerve excitation, the first solid step towards Stockholm.

As the author suggests, a fictional account might finish with the successful conclusion of the scientific project begun so many years earlier. Fortunately, Sir Alan provides a postscript: the Nobel ceremony itself, after a curious false alarm two years earlier; the trip to Stockholm three years later when his father-in-law, Peyton Rous, also won a Nobel Prize; the years as President of the Royal Society, especially the foreign visits to Japan and China, the latter still in the throes of the cultural revolution; and the period as Master of Trinity, are all engagingly described.

In both detail and generality this book gives a fascinating picture of an important facet of twentieth-century biomedical science, through the eyes of one of its most notable practitioners. The development of a nature-loving schoolboy into a mature professional scientist; the practical difficulties of experimental physiology, and the importance of finding the right question, the right collaborator and the right biological preparation are all emphasized, as are the responsibilities of science and scientists in wartime.

E. M. Tansey, Wellcome Institute