

# Behind the laboratory door

Hugh Rowell

**Explorers of the Black Box: The Search for the Cellular Basis of Memory.**

By Susan Allport. W. W. Norton: 1986. Pp. 271. \$17.95.

I STARTED this book filled with prejudice against it: I thought it probably combined muck-raking journalism with added publicity for an already over-exposed area. I apologize publicly for my suspicions. I will ask my graduate students and post-doctoral associates to read Ms Allport's work — they will find a great deal of value in it.

The author has written a very unusual book. I have an impression, based largely on reading book reviews, that historical accounts of research episodes and of the personalities and politics which shape them may not be uncommon in physics, but they are certainly rarities in biology. When they do occur, they are normally written by protagonists — one thinks of Watson's *Double Helix* — and are universally recognized as heavily biased renderings. Ms Allport, although a trained biologist, is not only an outsider to the area of research she describes, and thus with claims to objectivity, but she has also chosen to describe a still-developing episode, pursued by active scientists: she names all names, and she does not shrink from evaluations of personality, motive and character. Her chief characters include persons who devote exceptional efforts to obtaining publicity for their work, and can well be considered to have richly deserved the good and bad that it brings them — but I doubt whether many of them will be uniformly pleased by the image of themselves they see reflected here.

Ms Allport limits her study to a very small group of scientists and their work. They are the North American neurobiologists who in the past 20 years have busied themselves with the cellular basis of those functional changes in the nervous system of gastropod molluscs which are seen after exposing the animals to stimulus routines producing changes in the relation between stimulus and behavioural response: these workers characteristically describe the changes with terms originated by psychologists to describe outwardly similar effects in vertebrates, such as habituation, sensitization, associative conditioning, operant conditioning and the like. The author — like the scientists she writes about — ignores all related work on other groups of animals, vertebrate or invertebrate, or from other periods or other scientific communities.

With this tiny population she then attempts a very difficult feat, which has four components. First, she brings the

“general reader” enough cellular neurophysiology and learning theory to understand the work in question. Secondly, she gives a chronological account of the scientific progress of the various laboratories up to about the end of 1983. Thirdly, she portrays in detail the inter- and intra-laboratory rivalries and tensions, the disputes and the conflicting evidence, the cover-ups, the grantsmanship, the calculated absence of citations to the work of others, and the difficult questions of intellectual priority and of the influence over other scientists wielded by established workers with huge grants and with seats on most editorial and funding boards. Lastly, she attempts to portray the whole in a framework of the sociology of modern science, drawing heavily (and with due acknowledgement) on such authors as Robert Merton.

How well does she succeed? On balance, I would say that she does a very good job. Admittedly, the book has faults. The first third of it is unsatisfactory. There is no clear statement of aims, and the early, pedagogical parts are tedious. There the author often claims a scientific naivety — perhaps in an effort to strike a bond with the “general reader” — which the later chapters show her emphatically not to possess. There are also numerous anachronisms and historical errors — Lord Adrian is portrayed on p. 55 as using an “oscilloscope with a fluorescent screen” in the 1920s, and on p. 42 it is implied that chemical synaptic transmission was first conceived of after the introduction of the intracellular microelectrode. The distinction between these electrodes and extracellular microelectrodes as used in the cited work of Hubel and

Wiesel is not made. At one point, the crustaceans are said to be unsatisfactory for neurophysiology because they “die when they are opened up”.

However once fairly into her account of the work and personnel in the laboratories of Kandel, Alkon, Davis, Lukowiak, Gelperin, Sahley, Pinsker, Byrne and others, things improve dramatically. Not only is the difficult subject matter uncomplicatedly expounded, her portraits and character sketches are always highly identifiable, sometimes hilariously or embarrassingly so, and her accounts of events fit well with what I myself know. Most importantly, perhaps, the author has grasped many fundamental points about research in neurophysiology in particular and biology in general that evade many researchers. She sees clearly the dangerous tendency of the medically trained worker to ignore the implications of biological diversity in both organisms and cellular mechanisms. She understands that at least some non-medically orientated workers on non-human nervous systems are interested primarily in learning about those systems, and not in extrapolating to the human state. She knows that the scientist must statistically expect his work to be erroneous or ill-conceived, and yet cannot admit this to the scientific or other public if his publications are to be taken seriously or if he is to be allowed to continue. She recognizes that power corrupts, not least in scientific practice. She can see that a field can approach Nobel Prize value in the public eye simply by dint of the amount of money and publicity expended on it, without having made more than normal progress.

The later part of the book is fluently written and fascinating reading. I could only wish that Ms Allport had emphasized more that the subfield she describes rides on the shoulders of the faster moving but less publicized research in molecular and membrane neurophysiology. □

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Making waves — (left) wave fronts of cyclic AMP released by a monolayer of aggregating *Dictyostelium*; (right) a similar pattern, resulting from analogous kinetics, in the Belousov-Zhabotinsky chemical reagent. The illustration is taken from Arthur T. Winfree's *The Timing of Biological Clocks*, a new volume in the *Scientific American Library*. Publisher in Britain is W. H. Freeman, price is £15.95.