

Annual Review of Neuroscience, vol. 28. Steven E. Hyman *et al.* (eds). Annual Reviews, 4139, El Camino Way, P.O. Box 10139, Palo Alto, California 94303-0139, USA. 2005. 599 pp.

This issue of *Annual Reviews* is perhaps the best produced in this genre with a textbook-like quality unsurpassed by previous volumes or reviews in other areas from the same publishers. The editors deserve to be congratulated on this count. Having said that, I fail to see why they have chosen to include the incendiary first chapter on inheritance of intelligence. This, by votaries of the new Phrenology of FMRI, is at best expunged. I thought phrenologists and their pseudoscience were long ago erased out of existence from the face of the earth. I am annoyingly mistaken as I see them in their new avatar, with measurements of an even cruder kind, pontificating on how all men are not made equal. They get support from use of instruments that just about point to firing parts of brain, hardly to areas of useful activity, and claim to use it to see not only thinking but intelligent thinking. The samples and controls are selected to satisfy their need to say things, which I am sure, they are not convinced themselves. And it is worth noting that the worst doctor is a half-trained one! Biologists are prone to be taken for a ride by the so-called sophistication of instrumentation, which is so only in its inaccessibility and cost, not in the accuracy of measures. It is not fashion but fear of understanding that makes the biologist use unwarranted sophistication to perpetrate long proven nonsense as new discovery, and journals, books and peers fall for it. I am completely convinced that FMR is a good instrument for the good doctor to save lives, but of doubtful value in understanding brain function. Such studies seem to be driven perhaps by misunderstanding of such memorable statements from the eminent of biology like E. O. Wilson, 'To deny that genes have an important role in human as well as animal behaviour is simply to turn one's back on the copious evidence to the contrary' or James Watson 'I have gone out of my way to emphasize that we have really got to worry that a genetic underclass exists. I think our biggest ethical problem is people won't use the information we get and I think that is just as bad to let a child be born without any future'. It is only the 'mis-measure' as Stephen J. Gould succinctly put it and its relevance to challenges of

intelligent living that I object to. I can only quote Gould to reiterate how unacceptable and intrinsically prone to error such single parametric description of 'intelligence' is, 'for it reflects an ancient prejudice of thought, not a truth of nature'. I am not prescribing a way out of this moral dilemma, there cannot be one, and as moral animals we have to reiterate that the variations are minor compared to similarities, that it should not become central to classifying people as more and less endowed in intellect. Faculty and felicity both contribute to such assessments; faculties are generally identical even when genetically delimited and felicity is clearly environment-modified.

Synapses are the essence of brain function and although considerable progress has been made in our understanding of the chemistry of synapses, much remains to be learnt about their formation, function and plasticity. The actin cytoskeleton and its crucial role in coupling synapse form and synapse function is reviewed with great clarity by Dillon and Goda. Their models of activity-dependent changes in synaptic actin and spine shape and how such remodelling mediates structural plasticity associated with LTD and LTP is particularly appealing.

The review by Luo and O'leary is one that every student of neuroscience must read both for its clarity and purport. It covers a wide swathe of research in neuronal degeneration and remodelling. Axonal pruning occurs during development, for removal of connections damaged in adults and is also the basis of neural plasticity. The review covers various aspects of this phenomenon and suggests potential cellular and molecular mechanisms.

Other reviews in this volume cover specific areas in a competent manner and the contents are useful to individuals in specialized fields of neuroscience. Three reviews, however, need special mention as examples worth emulating for their thoroughness and depth of analysis as well as utility to general neuroscience teaching and research. It may be my pre-disposition, but the ones on olfactory memory, optical imaging and complex behaviour in *Caenorhabditis elegans* are by far the best in this compendium and I rate them as outstanding.

Ron Davis shares the recent excitement in the analysis of genes involved in olfactory memory formation. The large number of learning mutants and the recent discovery of olfactory receptors in flies has provided powerful tools of di-

rected gene expression, allowing analysis of olfactory memory in an unprecedented manner. This is profoundly influencing our views on learning and memory.

For a small worm that lives for hardly four days, *C. elegans* has amazingly complex behaviour patterns. This of course is the dream model animal for neurobiology because everything is precise with this worm, like the hermaphrodite with 959 (not one more or not one less) cells of which 302 are neurons, and exactly 56 are glia. Every cell and its connectivity are known with as much precision and one can see them live and functioning in the transparent animal. Since each of the complex behaviours has parallels in higher animals and in the worm they are controlled by a small number of cells, it is likely to be the model of choice for many of the fundamental advances likely to be made in neurobiology. Genetic analysis is likely to be often the most effective tool.

The review by Meisenbock and Keverkidis on optical imaging and control of genetically designated neurons in functioning circuits highlights the power of live imaging activity in the fly brain and goes well with the other two. I am convinced after reading this highly instructive review that live imaging at high resolution in brains of genetically well-suited animals like the fly and the worm is the way to go for real breakthroughs in neurobiology.

Clearly, this is a valuable volume for the neuroscience practitioner. I have to once again commend the editors for the layout and organization, which made reading this volume a wonderful experience.

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STATPHYS22: Proceedings of 22nd IUPAP Conference on Statistical Physics. S. Dattagupta *et al.* (eds). Indian Academy of Sciences, Bangalore. 2005. 558 pp. Price: Rs 500.

This volume is a collection of invited talks given at the international conference 'StatPhys 22', held at the Indian Institute of Science, Bangalore in July 2004. This is the main international conference in the area of statistical physics, and is held every three years. It was for the first time this conference was held in India, and it