

is good to suffer for suffering's sake.

It is in the perception of such chronological ambiguities that Rey's greatest strengths lie. Just as individual perception of pain is dependent on culture, so too were medical investigators of pain constrained by their cultural and scientific milieu. Ronald Pearsall, writing in 1975, singularly failed to acknowledge cultural forces at work, recognizing only "laziness and apathy" in the doctors of the late 1840s who refused to change their practice when faced with the possibility of anaesthetic surgery. In his eyes, their failure to use chloroform resulted "in agony to patients that was totally unnecessary".

Rey avoids such crassness. Of course some doctors were held back by apathy, but, as Rey points out, things that seem self-evident after the passage of years are by no means so simple at the time. Physicians of previous centuries — or indeed decades — did not see what seems obvious to us now. This was not through obstinacy or stupidity, but because of their necessary engagement with the critical thought of the time. Seeing laughing-gas in the same analgesic terms as post-operative opium, they were unable to recognize the potential of the gas as a surgical anaesthetic. Those who first used chloroform in surgery overcame this conceptual difficulty, but in so doing took a "political decision to take a chance on surgery without pain and, by so doing, took upon themselves the risk of the odd fatal accident". The 25,000 deaths attributed to anaesthetics in England and Wales in the century after 1846 make this point loudly and clearly.

It is clear, too, from these figures — as indeed from the heated debate raging in the pages of the *Lancet* in the mid-nineteenth century — that the decision to use anaesthetics in surgery was by no means a foregone or 'natural' conclusion. Older frames of reference persisted as doctors on the battlefield refrained from using chloroform — not just because using chloroform would have required another doctor to act as anaesthetist, effectively halving the number of surgeons in the field, but also because to be brave in the face of pain was manly, and to desire the removal of such suffering was a sign of weakness. Such a desire to suffer, Rey makes clear, is not confined to any one period. Motives change and times change, yet both the flagellants of the Middle Ages as well as the French 'dolorists' between the two world wars "saw in pain a type of catharsis, a means of purification from non-essentials, incidentals and falsehoods". The analgesic function of medicine, faced with such an attitude, fades into insignificance.

If Rey reaches one conclusion in her clear overview, it is that the way in which

we construct explanations for pain affects the way in which we perceive it, possibly with adverse effects on the sufferer. Although the book is staunchly academic, Rey manages to tell the human story of pain, recognizing that while pain is a fitting subject for academic research, it is also felt, both physically and emotionally, by the individual sufferer. As the anniversary of her death approaches, this splendid book seems a fitting memorial to the work of a woman who died from breast cancer at the age of 44. □

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## Generating diversity

Nel C. Moore

**T Cell Receptors.** Edited by John I. Bell, Michael J. Owen and Elizabeth Simpson. Oxford University Press: 1995. Pp. 483. £60, \$53 (hbk); £29.50, \$107 (pbk).

OUR understanding of the structure and function of T-cell antigen receptors (TCR) has come a long way since the discovery of these proteins just over a decade ago. Much of this progress is reviewed in this comprehensive book, which should appeal to a wide audience.

TCR  $\alpha$ - and  $\beta$ -chains, the variable (V) regions of which are responsible for antigen recognition, are encoded by discontinuous gene segments that are rearranged specifically in T cells during development. Detailed information about the extent and variability of the germline repertoire of V gene segments is therefore essential for an understanding of the potential diversity of T-cell specificity. The several chapters dedicated to this topic and the processes governing the rearrangement of these gene segments clearly emphasize the complexity of these events. In this respect, the inclusion of a table and nomenclature-listing of TCR  $\alpha$ - and  $\beta$ -chain V regions, as well as a plate section comparing various human and mouse V-region peptide sequences, are very helpful.

Unlike B cells, T cells can recognize only antigens presented by major histocompatibility complex (MHC) molecules on the surface of antigen-presenting cells. This so-called MHC-restriction, which results from selection processes during T-cell development in the thymus, represents the only specific interaction between T cells and antigen-presenting cells. So it is appropriate that a detailed structural and functional analysis of both TCR-MHC-peptide and TCR-MHC-superantigen complexes occupies several

excellent chapters. Similarly, the importance of these complexes in the development of the TCR repertoire in the thymus is also discussed.

Many other TCR-related subjects are covered. There is an elegant description of T cells expressing  $\gamma\delta$  TCRs rather than  $\alpha\beta$  TCRs, although the precise immunological function of  $\gamma\delta$  T cells is not yet fully known. And the impressive progress in understanding of intracellular signalling processes triggered by the engagement of antigen with TCR is also described in detail.

Inevitably in a multi-authored book such as this there is some repetition as well as a lack of coverage of several recent advances. Nevertheless, the volume is a solid work of reference that will be particularly valuable to those either starting out in or wanting to refresh their knowledge of T-cell immunology. □

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