(coprolalia), we are running the risk of “sanitizing” the syndrome and “ostracizing those who curse” — to whom the book pays tribute.

This book is a ‘must’ for anyone interested in the history of medicine, neurology and psychiatry as well as Tourette syndrome. There is no doubt that this is the best exposition of the syndrome’s history in the literature. The sources for the book, which make it unique, include the US Tourette Syndrome Association archives and newsletters, many taped personal interviews, letters to the author, previously untranslated articles and dissertations given to the author, as well as personal knowledge. Such details contribute to the very personal flavour of the book which is unique in a textbook of medicine. Kuschner’s is one of the most exciting and intriguing textbooks I have read: clinically and historically correct, extremely well written and an erudite and scholarly treatise. □

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Getting at where it hurts

Pain: The Science of Suffering

by Patrick D. Wall

Weidenfeld & Nicolson: 1999. 186 pp.

£12.99.

John Carmody

Scientists tend to scorn what they consider ‘popular’. Yet they generally expect the populace to support their work gratefully or, in the case of physicians, to accept their diagnoses and prescriptions credulously. When a venturesome few do write for audiences beyond their cloistered laboratories and clinics, their colleagues’ response is likely to be something akin to Samuel Johnson’s slur upon a woman’s preaching — “It is not done well; but you are surprised to find it done at all.” Still, the truth must be told, whatever the motives for such ventures, even if it may sound curmudgeonly.

The field of pain research has flowered wonderfully in the past 30 years, in both its clinical and scientific facets, and Patrick Wall has been a highly influential figure. As co-founder and enduring co-editor of the journal *Pain*, and as co-originator of the so-called ‘gate control’ theory of pain (which proposed that nerve cells in the spinal cord could, depending on circumstances, operate like a gate that is either open to or closed against painful input), Wall’s achievements are genuine and substantial. As well as speaking to the profession, he has been willing to communicate with a wider public: *The Challenge of Pain* (Penguin, 1982), for example, which he wrote with his Canadian friend and colleague Ronald Melzack, remains a significant and valuable book. Whatever Wall’s

intentions, the grandiloquently titled *Pain: The Science of Suffering* is not that.

Despite its extravagant promise to “explore all we know about the nature and causes of pain”, it is a far simpler and shorter book than that earlier one, and its intended readership is not at all obvious; to a real extent, its contents are merely a *rechauffé*. It is, to be blunt, an old man’s *pensées*, and is, for all its liberal use of sub-headings, over-discursive, solipsistic and scrappily documented. I am not saying that a ‘popular’ book should be encrusted with footnotes, but it must at least provide some plausible basis for its material. Wall’s new work relies too much for my comfort on its author’s ‘introspection’, and on dogma and an appeal to the reader’s respect for the author’s gravitas. The fact that there is a scattering of careless errors (such as his statement that acupuncture “was well known in the West in Elizabethan times, beginning with a textbook ... in 1683”, or the suggestion that the Latin word *placebo* originated with Chaucer) erodes one’s confidence.

Wall’s chapter on “The philosophy of pain” is not especially lucid. Many fine minds have, over the centuries, grappled with the plethora of puzzles about pain, and I am certainly not adequate to do them justice: nor, on this evidence, is Wall — his approach being compromised by his dismissal of their efforts as a “confused mess”. He is hostile to mind-body dualists for reasons that are not cogently explained; he is hostile to Catholicism, especially its tradition of valuing suffering which, I suspect, he does not understand; he tells us that he despises something for its triviality, yet trivializes or misrepresents ideas he does not value or appear to comprehend.

He also tells us — in an otherwise interesting chapter on “The placebo response” — that, in one unspecified study, “no personality type was found diagnostic of the placebo responder”, yet only a few lines later he advises, “Avoid pessimists if you are looking for placebo reactors”. He also claims that —

Excruciation: Bronzino’s sculpture of pain.

apart from a few trivial and serendipitous (but useful) side effects — the pharmaceutical industry has, over the past 50 years, made no advances in pain treatment. Yet in that period, for example, opiates with greater potency but attenuated side effects, and far safer anaesthetic agents, have appeared.

Some of Wall’s criticisms of medical education and clinical culture are telling, even if the whole book shows an invalidating Anglo-centricity. He also proposes an interesting (though not wholly convincing) concept of pain as an action-directed experience, and writes, “Pain is then best seen as a needs state, like hunger and thirst, which are terminated by a consummatory act”. Can this be true? At the risk of my sounding Platonic, and describing pain, not as a consequence of tissue damage but as a quality of the psyche, opposite to pleasure, could much the same not be said of the concatenation of sensory inputs that determine our responses to music or painting? Those sensations, surely, warrant consideration as a special functional category, as Wall insists on exclusively for pain.

So, in the end, we will all do far better to disregard this slight book — which mostly reads as if it had been dictated to a machine — return to *The Challenge of Pain* and look to Wall’s accumulated papers (for all that some colleagues have been sceptical of their content) as a more fitting testament to his achievements. □

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A provincial setting for the oceans

Ecological Geography of the Sea

by Alan R. Longhurst

Academic: 1998. 398 pp. £54.95, \$79

Yves Dandonneau

Oceanographers now have a global view of the circulation of oceanic water. This view is especially well depicted and explained by Matthias Tomczak and Stuart Godfrey in their *Introduction to Regional Oceanography*, in which the mechanisms driving the currents and controlling upward and downward motions are described for non-specialists.

Alan Longhurst frequently refers to this book, and also to Harald Sverdrup’s inspired explanation of the phytoplankton spring bloom at high latitudes, which is valid over much of the ocean. Given these current global views and the author’s experience and profound knowledge of the oceans, I was prepared for a thoughtful and comprehensive description of biology in the oceans. The most interesting and original part of the book is the first six chapters, which cover all the provinces and link the large-scale physics

of the ocean to the ecosystems. Afterwards, however, Longhurst divides his book into as many chapters as there are provinces of the oceans (about 50!). The result is a long, tedious enumeration of descriptions of regions, each time with the same plan and, inevitably, often the same content. After all, every province is almost as complex as the entire ocean, and this complexity can hardly be described in three or four pages. For example, Longhurst makes the Gulf of California a subdivision of the California Current Province, but he recognizes that it could as well be divided into 14, or even 33 locations, taking it beyond the reach of this book's format.

In 1,000 years, one drop of ocean water may pass through most of the provinces. The author thinks that "the debate between partitions and a continuum is somewhat sterile because both concepts will be required for different purposes, and they are not mutually exclusive". To me, the continuum sounds much more exciting.

In reading this book, I have realized how much the generation time of grazers varies with latitude, and the consequences this has for the food chain. This alone would have made a nice chapter, but I had to pick such pieces of information from here and there throughout the 50 provinces.

The division into provinces also results in some oddities. Should we consider that the region of the Pacific Ocean that is affected by the El Niño has moving boundaries? The response time of most zooplankters in this region is much less than the duration of El Niño events, and the distribution of tuna changes during these events, so the answer should be yes. Why not consider, then, that the boundary between the North Atlantic Subtropical Gyral Province and the North Atlantic Drift Province moves similarly, with the northward shift of the summer thermocline? Indeed, many grazers in these provinces have short generation times. The boundaries proposed here are subject to endless discussion.

If this book is tedious to read, it is extremely well documented and precisely written, and this is remarkable considering the diversity of sources and sometimes the contradictions Longhurst had to work with.

In the tropical Atlantic and Pacific, my own area of expertise, I was surprised that there was no mention of the tropical instability waves in the Atlantic, and that the Guinea Dome was placed in the Western Tropical Atlantic Province while its analogue in the south, the Angola Dome, was placed in the Eastern Tropical Atlantic Province. Overall, however, the summaries that are given for these two large regions are precise and exhaustive.

Everyone will find something of interest in this book. Finally, we oceanographers like to give a name to the areas where we go on

cruises. From this point of view, the partition proposed here is certainly the best one we have today. □

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Loose round-up lacks even circular logic

A History of the Circle

by Ernest Zebrowski Jr

Rutgers University Press: 1999. 214 pp. \$28

Ivor Grattan-Guinness

Popular books on or around mathematics appear quite regularly nowadays. This one nominally takes the circle as its theme, both for its mathematical properties and for its use in the physical sciences. Based upon teaching in American colleges, the level is fairly elementary.

The early chapters treat several manifestations of the circle in antiquity, including the use of rollers in transporting heavy objects and some features of astronomy. But after that the circle gives way to conic sections and closed but non-circular orbits as studied from Kepler to Newton. It comes back later rather indirectly via oscillations, pendular and simple harmonic motions and waves, and associated mathematical theories such as Fourier series. Late chapters skim across relativity theory and quantum mechanics, sandwiching an interlude on ancient architecture.

While the emphasis on applications is well taken, the overall impression is rather incoherent: links to circularity are tenuous in places, and many topics specifically tied to circles are omitted. The most obvious case concerns π . Some properties are stated, but no highlight is given to its four main roles, of relating the diameter of a circle not only to its

circumference (hence the eighteenth-century choice of the letter π , for *perimetros*) but also to its area, and to the surface area and volume of the sphere. It is enlightening, and also not at all obvious, that the same factor π is involved. The enabling theorem for the circle — area = (circumference/2) $\times$ (diameter/2) — is a profound result; the author presents one intuitive argument for it but does not register its significance. All sorts of other cultural possibilities are ignored; for example, that the classical problem in Greek geometry of squaring the circle may echo a desire, very evident with the Egyptians, of uniting the circular heavens with the Earth, long symbolized by the square.

As for history, the author states at once that he gives no conventional version. The accuracy of his statement can be fairly judged by a few typical quotations. "It was a long time before anyone had a practical need to measure angles to a precision much finer than one degree." In his *Elements*, Euclid "laboriously proved every mathematical relationship that was then known". "What Descartes did accomplish was to use rectangular co-ordinates in a new way" (he actually introduced analytic geometry). Einstein's creation of special relativity in 1905 was effected by "conduct[ing] his Gedanken experiments through mathematical logic"; indeed, in general "Scientists depend upon mathematical logic to generate their theoretical predictions" ("If only they did," Bertrand Russell might have sighed). Another circular sign comes to mind: 0 per cent for accuracy.

A good heuristic and historical introduction to parts of mathematics using the circle as its theme would make an excellent contribution to the popular understanding of mathematics. Perhaps somebody can take up the challenge. □

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New in paperback

Countdown: A History of Space Flight

by T. A. Heppenheimer

Wiley, £13.99, \$17.95

"... The history of spaceflight is unfinished. So too is Heppenheimer's book; the publisher left the last page blank, inadvertently one assumes. Authors sue for such incompetence, but in this case it might be a fitting conclusion to this useful but necessarily inconclusive study". Alex Roland, *Nature* 392, 143–145 (1998)

The Covenant of the Wild: Why Animals Chose Domestication

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Yale University Press, \$14.95

"Budiansky's thesis is that human relationships with other species are not so much the 'exploitation' they are often made out to be, but

arise from quite natural coevolutionary processes like those between other pairs of species ...

Perhaps the strength of the book is that it raises issues and makes points and then doesn't tell one what conclusions to draw." Marian Stamp Dawkins, *Nature* 356, 487 (1992)

Science, Jews & Secular Culture: Studies in Mid-Twentieth-Century American Intellectual History

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Princeton University Press, \$14.95, £12.50

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Princeton University Press, \$19.95, £11.95