New in paperback

Complexity: Life on the Edge of Chaos by Roger Lewin. Phoenix, £6.99. Reviewed in *Nature* **361**, 507 (1993).

The Evolution of Homo erectus: Comparative Anatomical Studies of an Extinct Human Species by G. Philip Rightmire. Cambridge University Press, £16.95, \$24.95. Reviewed by M. Day in Nature 348, 688 (1990).

Mammoths, Mastodonts, and Elephants: Blology, Behavior, and the Fossil Record by Gary Haynes. CUP, £16.95, \$27.95.

The Two Cultures by C. P. Snow. The physicist and novelist's influential 1959 Rede lecture, now issued with his successor piece, *A Second Look*, in CUP's Canto series, £5.95, \$9.95.

Killer Bees: The Africanized Honey Bee in the Americas by Mark L. Winston. Harvard University Press, \$10.95, £8.75. Reviewed by T. D. Seeley in Nature **356**, 626 (1992).

Simplicity and Complexity in Games of the intellect by Lawrence B. Slobodkin. Harvard, \$12.95, £10.25.

Rockets into Space by Frank H. Winter. An overview of the history of aeronautics. Harvard, \$12.95, £10.25.

Planet Earth: A View from Space by D. James Baker. An introduction to remote sensing. Harvard, \$12.95, £10.25.

The Maya by Michael D. Coe (5th edn). A clear and readable introduction. Thames and Hudson, £7.95.

The Third Revolution: Population, Environment and a Sustainable World by Paul Harrison. Penguin, £6.99, \$12.

Famous sleepers

Jim Horne

Why We Nap: Evolution, Chronobiology, and Functions of Polyphasic and Ultrashort Sleep. Edited by Claudio Stampi. Birkhäuser: 1992. Pp. 280. DM188, SFr168, £71, \$99.

PERPLEXINGLY, and by the editor's own admission, little of this book is devoted to "why we nap" (a title that has a familiar ring to it — in 1988, Oxford University Press published my own book called Why We Sleep). It seems that the contributors have tended to write about what they really wanted to, rather than to follow the editor's brief. Things become clearer when one realizes that Claudio Stampi's inspiration for the book is the peculiar sleep habit attributed to Leonardo da Vinci. Unsupported legend has it that the great man eschewed much of sleep by routinely sleeping for 15 minutes every four hours, taking only some 90 minutes of sleep in 24 hours. This 'polyphasic ultrashort sleep' (as it is now called) is distinct from just having one or two naps in the daytime and a substantial sleep at night: it is the loss of the latter with many more of the former. We are reminded by Stampi that this regime has been used by other famous men such as Napoleon, Salvador Dali and Thomas Edison, all of whom, I must add, were not typical of us mortals and, to say the least, were somewhat eccentric and perhaps tended towards hypomania, a disorder that has short sleep as a symptom. So we might be gratified that 'famous women' are absent from Stampi's list.

Stampi is also a keen yachtsman, and advocates polyphasic ultrashort sleep for long-haul racing. Unfortunately, not many of the other contributors share his enthusiasm for this form of sleep, and

concentrate on the more common findings associated with minimal sleep requirements and the effect of the 24-hour circadian rhythm on sleep. The book is therefore rather diverse, with the editor's own commendable and provocative chapters on polyphasic ultrashort sleep and its ramifications going one way, and most of the other contributions, by well-known sleep researchers, on more familiar, broader accounts of sleep, going another. I am left with the impression that the editor could and should have written much more of the book himself.

To be more positive, one of the volume's best developed themes concerns the question "how much sleep do we need?", and in this respect the chapters by N. Ball and by P. Naitoh are particularly perceptive. Ball, an ethologist, presents a comparative perspective on the variety of sleep schedules adopted by mammals and birds to suit their niches and needs; indeed, his epistemological slant also addresses why we nap. Naitoh, a respected sage of sleep research, has in effect produced an informed and critical but constructive overview of the whole book. He is circumspect about advocating many short sleeps per day, and in doing so tends to temper the editor's enthusiasm. Naitoh points out that although Leonardo's method may be worthwhile, it will be achieved only after much effort and anguish. Initially, at least, it is not conducive to efficient sleep, as for each sleep episode one must take time to fall asleep and then to enter a worthwhile sleep. Waking up will be difficult, and a period of grogginess ("post sleep inertia") ensues. Not all of Leonardo's inventions worked, and perhaps, for polyphasic ultrashort sleep, it is back to the drawing board.

Jim Horne is in the Sleep Research Laboratory, Loughborough University of Technology, Loughborough, Leicestershire LE11 3TU, UK.

Our Universe in the balance

M. Disney

Principles of Physical Cosmology. By P. J. E. Peebles. Princeton University Press: 1993. Pp. 718. \$59.50, £55 (hbk); \$29.95, £19.95 (pbk).

ONLY beasts could remain indifferent to the origin, structure and fate of the cosmos in which they live. Only saints could resign themselves to never knowing the answers. The upshot has been that every civilization, almost every generation, has put together such meagre observations as it possesses, has interpreted them in the light of currently fashionable theories, and has called the subject cosmology. There can be no doubt as to the signifiance of cosmology. There can be grave doubts as to its status as a science. Rutherford is alleged to have growled: "Don't let me hear the word 'Universe' in this department".

The difficulties of turning cosmology into a science are manifold. There's only one Universe; all comparisons and statistical tests are rendered useless. For all but the past few of its 60 decades of temporal existence, the Universe has been opaque to electromagnetic radiation. The time frame of human science is so short, in cosmic terms, that we have in effect only a single still shot of a dynamical Universe. Worst of all, we have only about eightand-a-half observations that have any bearing on the subject at all.

But cosmology is altogether too fascinating to be ignored. The real challenge to science is to put cosmology in the right place, which is neither in the dustbin nor on the altar. If we don't find a reasonable balance then we could waste enormous effort on futile pseudoscience, or halt progress altogether. Over the past few decades the subject has been inching forward, sometimes by design, more often by accident. In particular, the opening up of the electromagnetic spectrum is bringing, or promising to bring, interesting new observational data. But progress in no way matches the hullabaloo, often orchestrated by self-interested scientists, that gets into the media, for instance the ante-scientific way the recent results from the Cosmic Backround Explorer were released at NASA's press circus.

Nothing is more badly needed than a solid but accessible book on cosmology, written by an insider who has not lost his or her scepticism. Peebles's new book fits the bill admirably. A distinguished contributor himself, one of the predictors of the cosmic background radiation, he has taken much trouble to write a scholarly book not just for the expert,