

claiming it is like an anthill, then surely we have only 'mystified the anthill'.

Harth's solution is inspired by the observation that neurons are always relaying signals, never merely receiving them. The centrepiece of his theory is thus that reverberating loops of neurons are responsible for mental phenomena. In particular he makes much of the back projection from the visual cortex to the lateral geniculate nucleus (LGN) of the thalamus, an area that neuroscience neophytes normally view as a simple stepping stone in a one-way path up into the cortex. The obsession with this particular thalamo-cortico-thalamic loop inevitably makes Harth focus much of his contemplations on consciousness in terms of eidetic visual awareness, 'pictures in the head'. He accounts for the subjective quality of our vision as being at the behest of the signals bombarding the LGN from the 'higher' regions of the brain where memories, prejudices and the like will be generated. The more dominant this 'higher' input to the LGN, and hence the more unfettered from the sobering input of our retina, the more we will be at the mercy of our dreams, fantasies and delusions.

As it stands, this vision is not completely persuasive. Harth admits that the physicalist standpoint cannot yet account for the phenomenon of the feel of consciousness. Although this is a completely respectable and acceptable limitation, we might have expected, nonetheless, a richer account of the actual physical-chemical events in the brain itself, beyond the simple game of shuttlecock between relatively extensive regions of cortex and thalamus. Once he strays from this particular path, however, Harth becomes rather lost. He mentions the brainstem, yet does not elaborate on the way in which arousal might play a part in his scheme: he admits that beyond our vivid awareness of raw pictures, we would need to retreat into the 'neural jungle of the cortex': but then he leaves us there in uncharted territory, without any clue as to how more abstracted awareness might be subserved. He points to drugs and anaesthesia in support of the physicalist standpoint, yet he does not incorporate the actions of, say, LSD or morphine, let alone the powerful intricacies of neuro-modulation, into what remains in consequence a factually thin, impoverished viewpoint.

Even when we look beyond the machinations of actual neurons, it would have been helpful for the description of awareness of 'pictures in the head' to be placed in the context of other candidates for the seat of consciousness, not least the highly popular circuit linking another region of thalamus (the nucleus reticularis) and the cortex, which has been previously proposed to provide the all-important ingredient for making us conscious of the

otherwise unconscious. Another disquieting whitewash is that Harth dismisses the degree to which our consciousness is kept in touch with external reality by glibly referring to 'an internal logician'. This is surely tantamount to stretching out in the front stalls of the Cartesian Theatre, and certainly offers no new insight. But then again, Harth makes no claim to be a neuroscientist and cannot therefore be expected to produce an embroidered account of the intricate workings of cortical circuits in literal, physiological terms. The onus is surely on neuroscientists to develop a scheme free of metaphor and extending beyond one or two pathways, be they linear or looped.

Freeman Dyson is quoted at the beginning of a chapter as claiming that, "In dealing with the problem of consciousness, physicists have had courage but no competence, biologists have had competence but no courage". The book frames questions that really only neuroscientists can answer: it is high time they proved their worth. In the meantime, Harth transmits an infectious concern for the 'fuzzy' edges that surround the beginning of life, a contempt for the potential of the plodding analogues of computation and a plea that we are not changing into automata bereft of original ideas. The strength of this book lies not in its detail, but in its breadth and its humanity. □

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Spreading information

Jonathan M. Mann

The Slow Plague: A Geography of the AIDS Pandemic. By Peter Gould. *Blackwell: 1993. Pp. 228. £35 (hbk), £12.99 (pbk).*

PETER Gould takes the readers of his book on a voyage, proposing to offer a new look at AIDS, with new vistas and horizons but, unfortunately, he leaves us disappointed and dispirited. He starts with an attractive thesis — that geographical perspectives on the human immunodeficiency virus (HIV) pandemic may offer a new insight — but simply fails to deliver on his promise. This is particularly frustrating as he is addressing the critical question of how to give shape (and therefore meaning) to a complex phenomenon, the global epidemic of HIV and AIDS.

It is true that existing 'pictures' of the pandemic are generally simplistic, failing to capture the diversity, differential in-

tensity and velocity, and unstable nature of HIV/AIDS in the world today. As a relatively new historical occurrence, the HIV pandemic is still highly dynamic, which includes its continued spread in all affected areas (in the United States, 40,000–80,000 new HIV infections are projected this year, along with about 75,000 new infections in Europe), its spread to previously little-affected places (such as rural areas or South-East Asia) and its highly differentiated and evolving nature within single urban areas such as Miami, New York, Paris or Nairobi. For all these reasons, the promise of a new approach to structuring our understanding of the pandemic, based on an emphasis on the 'space' of the geographer, is appealing.

The book is indeed initially stimulating, with sharp and pungent writing. The author's wide-ranging observations and speculations are full of energy and passion. He shines when criticizing others, which, at least at the beginning of the book, heightens our expectations.

The first disappointment is Gould's curious weakness for minor inaccuracies and a lack of precision. For example, he is mistaken when he labels the US Centers for Disease Control (CDC) "the international center for reporting the outbreak of diseases all over the world"; states that Sweden proposes that most people with AIDS should be put on an island; and reports that "tens of millions of WHO and CDC research dollars" were spent in Zaïre.

Second, the reader becomes impatient wondering when geography's critical insight will finally be articulated. For example, the chapter on Thailand, although entertaining, could have been written by any number of authors uninformed beyond general literacy about the science of geography. There are some excellent and interesting maps of cumulative AIDS cases in the United States (particularly in the Bronx in New York) and brief discussions of spatially contagious and hierarchical diffusion, yet these do not add enough geography to satisfy the reader.

But let us come to the central point. Having promised and failed to demonstrate how geography will make a critical difference, the author's real agenda emerges. He informs us that there has apparently been a conspiracy against geographers; every time they have tried to clear up the confusion about AIDS, they have been rebuffed. The following is typical of the tone of his discussion: "I want to . . . look at a few . . . aspects of the way bureaucratic power, combined with a deadly combination of Establishment ignorance and arrogance, suppressed any consideration of the spatial dimensions of the epidemic, denying both the scientific community and the general

public any knowledge, insight and real awareness of what was unfolding into a human tragedy." Really? Regrettably, in the end, this is just an angry book, with familiar targets for the general reader: bureaucrats, governments and doctors ("... the medical profession, which itself seems to have been elevated to the sacred"), as well as scapegoats for AIDS "insiders": epidemiologists in general, the CDC and the National Institutes of Health.

Then at last, near the end, the author informs us about his central concern, which is that in HIV/AIDS prevention and care, the rights of certain individuals are taking precedence over the rights of the larger group. Finally, we are on familiar territory, even if geographical "new found land" is not involved.

The world does face a global crisis in the continuing spread of HIV and its rapidly mounting personal and social burden. How we define a problem largely determines what we do about it. Therefore, despite this book, I am convinced that creative efforts to 'map' this pandemic, including its social geography, could well be important in the evolving effort to give shape and meaning to the global challenge of HIV/AIDS. □

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Sex, lives and hormones

Peter Marler

Behavioral Endocrinology. Edited by J. B. Becker, S. M. Breedlove and D. Crews. MIT Press: 1992. Pp. 574. \$34.95.

FRANK Ambrose Beach effectively launched the systematic investigation of behavioural endocrinology 40 years before his death with his pioneering 1948 monograph on hormones and behaviour. Two years later he published his famous diatribe, *The Snark was a Boojum*, berating the so-called 'comparative' psychologists of his day for their myopic focus on the white rat, and urging them, the boojums, to extend their mandate to the animal kingdom at large. The discipline had to wait almost half a century for an all-embracing undergraduate text to emerge, a gap now handsomely filled by *Behavioral Endocrinology*, whose editors are all inheritors of the Beach tradition. He would surely have celebrated the degree to which his call for snarks to join forces and endorse the phylogenetic approach has been taken to heart as they explore the way in which hormones exert their manifold effects on the behaviour of organisms.

The 16 chapters by 19 authors, all experts in their field, range from sexual behaviour and sex differences in cognitive functions in humans (C. S. Carter, E.

Hampson, D. Kimura) to the wandering behaviour of the tobacco hornworm and other aspects of invertebrate behavioural endocrinology that illustrate well the advantages, if you are a reductionist, of working with simpler nervous systems (J. W. Truman). Most of the authors are psychologists, and almost inevitably rodents get the most intensive coverage, but the phylogenetic breadth covered is nevertheless impressive. A masterly overview of the behaviour of reptiles and fish (D. Crews) serves to remind us that the causal links between sexual behaviour and gonadal hormones are by no means inviolate, and have been severed repeatedly in the course of evolution. His essay serves as a first step in placing behavioural endocrinology in the functional perspective we associate with modern developments in ecological and evolutionary thinking, although more cross-references to this literature would have been welcome (one searches the bibliography in vain for references that students might want to pursue to the seminal contributions of such biological behaviourists as William Hamilton, John Krebs, John Maynard Smith and E. O. Wilson).

The book is expressly designed as an introductory text that begins from first principles and assumes a minimal background knowledge in biology. It is well designed, has a useful glossary and a bibliography with 1,143 entries. The introductions occasionally fall into the somewhat chatty 'gee whiz' style that sometimes plagues introductory psychology texts (for example: "amazing as it may seem" (p. 12); "the mysterious and fascinating world of sexual behavior" (p. 69); "hormones are not love potions" (p. 69)), but they quickly shed these stigmata of adolescence to grapple with an impressive breadth of subject matter, from molecules to cognition.

Much of the book can serve well as an introduction for students in the neurosciences. Some chapters, such as that of Crews, focus especially on ideas and principles, and others on details of the physiological machinery, such as those on male (M. J. Baum) and female (Carter) sexual behaviour. Chapters by S. M. Breedlove, D. B. Kelly and E. Brenowitz on sexual differentiation of the brain and courtship behaviour deal with sexual dimorphisms, the role of hormones in their development, and the influence of sexual differences on the adult social behaviour of mammals, birds, amphibians and fish. The distinction between activational and organizational effects of hormones on behaviour, fundamental though not necessarily categorical, pervades the entire book. Parental behaviour is authoritatively reviewed by J. S. Rosenblatt, with many illuminating comparisons between mammals and birds, and salutary reminders that some aspects of parental



MEXICAN wolves showing affection — the male (left) is giving the female a ritual, painless bite. Taken from *Trail of the Wolf* by R. D. Lawrence. Key Porter/Verulam, £17.95, Can \$34.95.