

analysis of a political issue. Staub prefers the neutral scientist's listing of factors that predispose the occurrence of genocide (for example 'political instability of the region at risk'). This is a rather partial argument to pull off, and it is not helped by some overgeneral assertions about human nature. And when the example cries out for a broader political palette, as it does in the case of the Khmer Rouge, then the insensitivity to a more openly political analysis becomes a real hindrance. One asks oneself whether the editors asked their authors to keep things apolitical; certainly Staub has, elsewhere, not shrunk from politically literate and concerned writing. (In fact, he has recently been one of the few to go on public record in criticism of the United States' lead up to the war in the Gulf.)

Reflecting on the book as a whole, two questions come to mind. I wanted to know what it was that societal psychology explained: sometimes we were talking about individuals (in groups or larger aggregates) sometimes about abstract social phenomena (economics, medical ethics). It is an unresolved dilemma in this book—largely, I suppose, because many voices are speaking—that the image of societal psychology's target problem never really gets in front of us. The impression I am left with is that its lines are kept blurred by those who prefer the traditional methodologies to tackle even the most societal of phenomena. I guess this would not be an unfamiliar anxiety to readers of this journal; environmental psychology is peculiarly liable to the twin temptations of explaining individual actions socially and social collectives psychologically. I also get the impression that societal psychology of the kind showcased in this book is going to disappoint some readers by its careful avoidance of any analysis of the ideological language which informs any thinking about social issues—even when what is being looked at is as ideological as economics or as political as genocide.

Readers who approach this book sympathetically—who are building a library of social psychological approaches to social phenomena, say—will get a substantial set of individual reviews out of it. But though the contributors are usually expert enough to pull threads together, they don't always weave them into very novel patterns, and I am not sure if every chapter will satisfy someone looking for a very radical departure. Nor am I sure that the empiricist tone of the research methods in most of the chapters will displease someone bent on sticking with the traditional formulas of positivist social psychology.

Auditory Scene Analysis: the Perceptual Organization of Sound. By Albert S. Bregman. Cambridge, MA: MIT Press (Bradford Book), 1990, xiii + 772 pp. c. £50, ISBN 0-262-02297-4.

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Al Bregman is Professor of Psychology at McGill University, Montreal, Canada, and has been one of the leading researchers in auditory scene analysis for 20 years. He is founder and director of the Auditory Perception Laboratory at McGill.

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When we survey a visual scene, we automatically analyse it into its constituent objects—tables, people, bookshelves, books etc. The effortless way we do this belies the

complexity of the underlying processes, and arguably one of the major successes of recent work in artificial intelligence has been the computational modelling of the early stages in visual scene analysis following the seminal work of Marr (for example 1982¹). Bregman has been studying the analogous problems in auditory scene analysis for two decades, and this book brings together the relevant work from psychoacoustics, speech perception and music. Bregman argues that the major function of auditory scene analysis is to discover and track over time the separate 'streams' of sound (i.e. sounds emanating from the same source). Consequently, (unlike almost all other academic research on audition, which investigates auditory performance under near optimal laboratory conditions), Bregman's interests lie in the perception of sound in complex, noisy, naturalistic settings. The methodological debate between laboratory settings and 'ecological validity' has continued for decades and in many domains. Bregman's contribution to this debate is to demonstrate that, given a carefully structured research programme, the two approaches can be complementary, with laboratory research able to add detail to the understanding of behaviour in richly structured environments.

The book comprises eight long chapters, and Bregman attempts the feat of presenting technically demanding research of high quality while making the concepts accessible to a non-specialist. This is achieved by making the first chapter a stand-alone introduction to the field and the research questions, and the final chapter a stand-alone summary, conclusion and discussion of future research questions, while presenting the necessary technical details and experiments in the intervening chapters. The strategy works reasonably well, in that an excellent overview can be gained by reading just the first and last chapters, and readers can skim the remainder for topics of particular interest. Of particular note is the lucidity and lack of pretension with which Bregman writes, allowing him to make difficult and technical concepts clear.

I was very impressed by the book. Through his breadth of knowledge and theoretical understanding, Bregman has provided a research rationale which allows him to organize a mass of data which would otherwise seem a chaotic jumble, and also to give clear indications of the important issues still to be resolved. The book will prove to be a landmark in audition research, one of the few texts that stands comparison with the late David Marr's immensely influential book on vision. While Bregman surprisingly fails to mention Marr's work, there are clear parallels between the approaches. One limitation of Bregman's theories is that, unlike Marr, he has not implemented them in computational form, though he argues strongly that this is one of the major research issues. However, Bregman is able to provide a fuller analysis than Marr in that he makes a critical distinction between 'primitive' (innate) phenomena and 'schema-driven' (learned) phenomena, whereas Marr only considered the former. This distinction (frequently overlooked in both vision and audition research) permits differential research strategies to be adopted.

The book will be of interest primarily to researchers in audition and vision. While there is some potential interest to readers of this journal, I think it unlikely that many would wish to do much more than read the first and last chapters, and thus, unless one has a direct research interest, it is hard to justify the cost of buying the full book. On the other hand, if the publishers were to bring out a much shortened (and cheaper) edition based on the first and last chapters, the slimmer volume would be a worthwhile acquisition for anyone interested in theories of how people hear in the natural environment.

Note

(1) Marr, D. (1982). *Vision*. San Francisco: Freeman.

City Design and City Sense: Writing and Projects of Kevin Lynch. Edited by T. Bannerjee and M. Southworth. Cambridge, MA: The MIT Press, 1990. ISBN 0-262-12143-3.

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Tribdib Bannerjee and Michael Southworth are both former associates and co-authors of Kevin Lynch: the former is now Professor of Urban & Regional Planning at the University of Southern California, the latter is Professor of Urban Design and Environmental Planning at the University of California at Berkeley.

Christopher Spencer is the Book Review editor of the Journal of Environmental Psychology.

Each of us has our own Kevin Lynch: for us, he may have been city planning guru, utopian, proselytiser for the poor, early Green, advocate of flexibility in design, theorist of urban form, and so on. For most environmental psychologists, the first acquaintance—and still our first association—with that name is ‘The Image of the City’, and the daring promulgation, in the concept of the legibility of cities, of a linkage between aesthetics, affect and measurable aspects of the urban image. We remember the excitement of the book’s concepts, the candour with which Lynch admits to possible flaws in his methodology in gathering cognitive images after people have walked round the block: and the fact that, until then, few aestheticians and theorists had even bothered to take the empirical route. I have lost count how many subsequent papers within the environmental cognition literature refer to this 1960 volume as ‘seminal’—each one further providing the truth of this assertion. But few have truly taken on board the richness of vision that that book—and the rest of Lynch’s writing—offered us.

Indeed, Lynch himself offered the field, a gentle chiding when, 16 years later, he wrote the preface to another milestone book—Moore and Golledge’s *Environmental Knowing* (1976). For him, the *raison d’être* of the field was in asking

‘What interchange between people and their environment encourages them to grow into fully realized persons?’

People grow in their understanding of the environment in a *social* context, usually that intimate social group in which we grow up and learn our values. Yet, as Lynch asks, how much of research on cognition takes into account this situated, developmental process?

Similarly, he gently chides the researcher who is content to use a single technique:

‘Any attempt to elicit mental images should use every means and language it can, to check interrelated findings, and to bring out aspects which are incommunicable in one tongue or another.’

With the passage of a further 15 years, how many of us have yet heeded his advice? Similarly, when we read Lynch on the need to develop theories to link cognitive to behaviour, do we not secretly agree with him that ‘all too often functional discussions