took off explosively because, by the time it appeared, most of the general problems of the technique had been solved and it was a relatively simple matter to transfer from paper to thin layers.

If you are about to start chromatography then this book will not describe how to separate the compounds of interest, be they aminoacids, steroids, dyes, and so on. However, if you have some or even a great deal of experience then it is a mine of information covering the whole subject in a most up-to-date manner. Extensive discussions on preparing plates, precoated plates, the mobile phase, types of chromatography, documentation, quantification and reproducibility, preparative and other aspects of the techniques are given in a very readable manner. Many tricks of the trade are described and I found some which I had not picked up in over twenty years of experience. Conversely, I feel that I might add a few to their repertoire. The best way to cut foil-backed layers is with a guillotine and to prevent glass capillaries scratching plates it is best to place 1–2 mm plastic tubing over the end which will be applied to the plate.

This book can be confidently recommended to all who practise thin layer chromatography and it would be a valuable addition to all departmental libraries.

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Animal communication

How Animals Communicate. Edited by T. A. Sebeok. Pp.1128. (Indiana University Press: Bloomington and London, 1978.) £40.

ABOUT ten years ago, T. A. Sebeok edited two books on animal communication, one of which became a standard reference work in the field. The present volume is intended to update and replace both of these earlier ones. Fitting two into one and taking account of progress has led to a massive volume at an astronomical price.

Editing a book to which there are 38 separate contributions must be a daunting task if the contributions are to appear on time and are to be well integrated with each other. Unfortunately, Sebeok has cut corners in these respects, the different chapters varying greatly in style, organisation, degree of detail and length, and many of them (presumably those by the more punctual authors) containing no references after 1974. Strictly imposed word limits tailored to the importance of each author's topic and more rigorous selection of the topics to be covered would have made a shorter, better and cheaper book. This is not to say that the book does not deserve some applause: many of the individual chapters will be, within their limited areas, the definitive reviews and works of reference which the whole book was intended to be.

One reason for its length is that the book is split into three sections, each classifying the field in a different way and thus involving some overlap. The variability of treatment is well illustrated by the first section, which deals with theoretical issues. Here there are three thorough and useful chapters on evolution (Marler), ontogeny (Burghardt) and action patterns (Barlow). In the other three Lieberman repeats his controversial ideas on the evolution of language, Griffin gives a brief personal perspective and Robertson reviews cellular communication, a topic of little relevance to the book's main theme. The second section deals with communication split up according to the senses and is equally patchy. There are useful conventional reviews of pheromones (Shorey) and visual signals (Hailman), as well as two excellent ones on more specialist but intriguing phenomena: bioluminescence (Lloyd) and electric signalling (Hopkins). Beside these are a more or less irrelevant article on echolocation (Griffin), an out-of-date one on acoustics (Busnel), reprinted from one of Sebeok's earlier books, and a chapter on tactile communication which deals only with humans (Geldard).

The third section of the book, which accounts for three-quarters of its length, covers communication in selected animal groups in a series of 25 chapters. Some of the groups about which less is known are dealt with almost species by species, yet a more restricted approach has had to be adopted to those which have been more widely studied. Hölldobler shows how well this can be done with his article on social hymenoptera, and the artiodactyls (Walther) and higher primates (Oppenheimer; Gautier and Gautier; Marler and Tenaza) also receive good thorough treatment. The birds lose out a bit with a relatively brief and general article by W. J. Smith. The book ends with an article by Sebeok on the relevance of animal communication to human studies, preceded by one on man–chimpanzee communication by Fouts and Rigby. The editor's view on the rather sterile controversy as to whether the feats of chimpanzees constitute language is neatly expressed by the appearance of the names of these chimps in what would otherwise be an author index.

Overall, this book contains much that is readable and interesting, but it falls short of being an encyclopaedic work of reference because it covers some areas very much more fully than others.

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Interpreting fossil assemblages

The Ecology of Fossils: An Illustrated Guide. Edited by W. S. McKerrow. Pp.384. (Duckworth: London; MIT Press: Cambridge, Massachusetts, 1978.) £14; $22.50.

THIS book is the first attempt to portray fossil communities of marine invertebrates from every geological system since the Precambrian. It contains 125 block-diagrams of fossil assemblages, each picturing animals and/or plants in life-position, in many cases their position when buried as fossils and their appearance in cross-section in the sediment. Each assemblage is described and for each system there is a general introduction. The book owes a great deal to Mrs. E. Winson for her excellent drawings. The fact that different taxa may be impossible to distinguish in these diagrams — for example, *Orthambonites* and *Pleurorthis* in fig.5, or the two species of *Batillaria* in fig.115 — is a useful reminder to the student that fossils cannot usually be identified properly at a glance; but too many of the pictures are given impossibly accurate names.

Although biologists do not agree amongst themselves on how a community can be defined, the authors consider that there is only one way to define fossil communities: a group of animals living in the same habitat. This convenient empirical definition is elaborated in the introduction to the Silurian, and it becomes apparent that they recognise that it is the associations of taxa themselves that define both the habitat and the community living in it: habitat is not intended to be defined by the inorganic facies of the sediment. Nevertheless, many of the communities in this book are tied to particular facies environments — for example, "Upper Devonian Clastic Shelf" or "Muddy Lime Sand" (in the