likely to be increasingly useful. They are, however, of little intellectual interest. Indeed it is characteristic of the computer revolution that the most successful applications of computers — computer-aided design, airline reservations, word processors, bank transactions and so on — were devised without the need for ideas of much depth or generality. If you want to land an aircraft automatically you do not place in the cockpit a robot sensitive to light of between 380 and 740 nm with limbs to manipulate the controls: you simply fly the plane down a beam, a dull but effective method.

This raises the second question. Will the successful applications of AI divert its practitioners from more fundamental research such as obtaining a rigorous understanding of human vision, natural language and reasoning? The answer here must surely be negative. The commercial appeal of the discipline will continue to force expansion of AI departments. Although this had led and will for a time continue to lead to many of their staff being rather mediocre, within those departments the best brains are likely to continue to work on the most interesting and fundamental problems. Indeed in the long run — and it probably is a very long run — easy communication between man and machine can only be achieved once we reach a much better understanding of how the mind works.

Neither Waldrop nor Aleksander and Burnett raise the latter two questions, but each book is of value in its own way. *Man-Made Minds* gives quite a comprehensive history of AI and describes reasonably clearly a fair sample of work in the subject. The book is well documented, but has a marked American bias. Waldrop wrongly attributes the concept of an augmented transition network to an American rather than to Jimmy Thorne and his collaborators in Edinburgh, and he makes no mention of Max Clowes of Sussex University who wrote one of the first scene-analysis programs. Moreover, Christopher Longuet-Higgins may well feel indignant at being described as a neurophysiologist.

Waldrop is also a little too prone to accept programmers' claims at face value — as far as I know there is no evidence that LOGO or any other computerized educational system is more beneficial to students than normal methods of instruction. He is, however, particularly good on recent applied developments like the use

• *Creative Intelligences*, edited by Richard L. Gregory and Pauline K. Marstrand, presents papers from the British Association Meeting in 1986. Animal and manufactured cognition are covered, from the development of intelligence through species to studies of intelligent machines. Newly published by Frances Pinter, London/Ablex, New Jersey, the book costs £20, $29.50.

of 'Outlining' programs for planning: such programs enable the user to make notes of proposed activities and to shift around their order and interconnections. It is a compliment to Waldrop that although he claims to have used such a system in preparing his own book, the reader would not know it.

Thinking Machines contains a less detailed historical account, but it gives the reader a clearer and more detailed picture of the techniques of AI, including many procedures, such as breadth first search and the use of push down stacks, that are not mentioned by Waldrop. Two chapters are devoted to Aleksander's own work on pattern recognition: curiously enough, they are the only chapters in the book that are unclear.

Both books are useful. For a general account of AI including its history and politics read *Man-Made Minds* and for an unusually clear elementary account of its techniques read *Thinking Machines*.

Both finish with discussions of the future, of which Waldrop's is the fuller. He considers such problems as the futility of human existence in a world run by robots, the ethics that should be implanted in them and the possibility — which he rejects at least for the near future — that they will throw people out of work. Aleksander and Burnett are more down to earth and cautious. They summarize their position neatly by taking up the issue of people as pets: "What we should be looking forward to is not the day machines start to treat us as pets, but a time when they will have become sufficiently intelligent for potential users to give them house room".   □

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Pro-am araneology

John Dalingwater

The Spiders of Great Britain and Ireland, Vols 1–3. By Michael J. Roberts. *Harley Books, Martins, Great Horkesley, Colchester CO6 4AH, UK: 1985 and 1987. Vol. 1 pp.229, £45; Vol. 2 pp.204, £45; Vol. 3 pp.256, £55. £135 the set.*

PALPAL structure in male spiders and the appearance of the genital area in females are usually extremely complex and species-specific. So, crucial to any diagnostic account of spider species is the quality and accuracy of the illustrations of palps and epigynes: in Roberts's work these are of a standard rarely achieved in the past and unlikely to be matched in the future. The recently published Vol. 2 on the Linyphiidae, the last of the three volumes to appear, is particularly welcome. It will greatly ease identification within this family, which contains nearly half of the 623 British species.

Why, therefore, will these books not be at the elbow of every serious British araneologist as he identifies his spiders? There are two, interconnected reasons: size and price. These A4 volumes are difficult to use alongside a microscope and are so expensive that those fortunate enough to be able to afford them may not wish to risk their investment on the work-bench. I suspect that the books are so expensive because their large and lavish format was determined by the requirements of the least useful, though admittedly the most spectacular, volume — the third. This consists mainly of full-page colour plates of selected species, painted from freshly preserved specimens; they are splendidly detailed and accurate, a joy to behold, but of limited value for identification.

Eight-legged art — male Oxyptila praticola, *from the colour original in Vol. 3 of Roberts.*

Volume 1, which also appeared in 1985, contains an introduction, notes on classification and nomenclature, a key to the families, and covers the Atypidae to Theridiosomatidae.

My criticisms are of the format only and should not obscure Roberts's sparkling achievement in producing a work that many an academic biologist would regard with pride as crowning a lifetime's effort. Yet Roberts is an amateur and still a young man, which makes his success all the more remarkable. But we should be used to the pre-eminence of amateurs in British araneology: Roberts is simply the latest to take his place in an unbroken succession of distinction stretching back to the middle of the last century. And it will be well into the next century before a further major work on the British spider fauna is attempted. Again it will be produced by an amateur, not least because, by then, taxonomic studies may well be considered an improper activity for a university or museum biologist.   □

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