Pick a Peck of Pigeons


This book is almost two inches thick. Its type is just about legible, but is half the size of that in this journal (and printed on paper of inferior quality). Fifty authors have combined to contribute 34 chapters. It is thus generous in quantity, and it is thoroughly serious in academic quality. I would not recommend it as bedside reading for lay readers, but undergraduates and teachers may find it a useful reference, since “as discussed in Roitblat et al (1984)” will apply to a wide range of topics. As an academic interested in the topic, I am glad to possess a copy, but I must express a couple of reservations. First, the book is based on a conference which took place in June 1982, and so much of the material is no longer fresh. Second, even as an ardent fan of pigeons, I feel the content is too heavily biased towards this resilient species. By my count, 11 chapters are just about pigeons, with 8 about rats, 4 about monkeys and one each for chimpanzees, starlings, and an obscure crow, leaving 11 in the ‘mixed’ category, several of which are mainly about pigeons anyway. The popularity of Columbia livia is due to the excellence of its digestive, rather than its cognitive, system. A tablespoon a day of dried grain keeps pigeons puzzlingly healthy, but because they can store several days’ supply in their crop they have an extremely vigorous appetite when hungry. Until recently this was exploited mainly in the use of pigeons as information carriers (notably in France: more than a million messages were carried by pigeon during the seige of Paris in 1871), but nowadays the hungry pigeon appears to be finding almost as much employment as an information processor, in psychological experiments.

What sort of things do pigeons actually do in these? Almost always they peck at round push-buttons on a wall, being occasionally rewarded from an automatic food dispenser. By projecting coloured lights, or pictures, on these keys, the bird can be set an apparently limitless number of intellectual tests. For instance, by lighting two keys in a certain order, the bird may be instructed to peck left, left, right, right; or in any other of the 8 possible ways of pecking three times at two things. But then, after a particular sequence like this, both keys are lit in a particular colour, and to get its food the bird must peck according to the rule of — if red, peck whichever key you just pecked first, if blue, peck the key you pecked second, if white, the one you pecked third. Not surprisingly, pigeons are more accurate at reporting the key they pecked third, since that’s what they did last. Such recency effects were studied more systematically by Wright et al, who allowed birds to look out of their test box at pictures on a screen. A list of four different pictures was shown on an upper screen, and then a single picture was shown in a lower position. If this was one of the previous 4, the rule was to peck a key on the right, but if it wasn’t, one on the left. It is fascinating to some of us that, with certain time values, pigeons are better at recognising the first item on the list than any other — a primacy effect, with sometimes very nice ‘U’ shaped serial position functions, just like those in the textbooks on human memory.

It is certainly arguable that these are very artificial things to do with pigeons. The book contains some more naturalistic examples of animal cognition. Rats are still being tested in complicated mazes. A new twist is to have a radial, or retractable design, putting food at several different places, thus allowing rats to demonstrate their cognitive maps and working memories by not revisiting places where they have already eaten the food. Much greater mnemonic feats are routinely performed by a species of crow called Clark’s Nutcracker, which lives in cold forests on a diet composed almost exclusively of pine nuts. In a good season it is believed to hide 20 or 30 thousand of these in the autumn, in hundreds of hiding places, returning to collect them throughout the next year. This can be tested in lab conditions, with various tricks such as using a sandy floor and brushing the sand and/or removing the nuts after the bird has hidden them, which make it plain that his species has a remarkable place memory. Short-term hiding of individual seeds and nuts is also well-developed in our own nuthatches and the smaller tits, and I suspect that all birds have very good place memories, whether or not they hide things. Starlings use theirs for reverse commuting between Leicester Square and the suburbs, and in a chapter here are shown to also have perfect pitch and the ability to generalise rhythms.

One of the messages of a book such as this is that skills of memory and perception are not the exclusive preserve of the order primates, but clearly to understand the origins of human intellectual excellences it is more important to study chimpanzees than starlings or pigeons. Savage-Rumbaugh contributes yet another fine chapter from her long-term project with Austin and Sherman, young chimps who have been trained to communicate with each other by means of ideograms on a computer-controlled key board. This is not a single mental accomplishment but depends on various other things. Here the emphasis is on indication, and the “pro-declarative”, which is pointing. Chimps are too well-behaved to point with their fingers in the wild, although they use many other arm gestures, but they acquire this habit under certain conditions, and Savage-Rumbaugh argues that the concept of deliberately pointing-something-out, even by this simple method, is a more fundamental aspect of language use than arbitrary associations between objects and symbols. Her chimps
were tested for symbolic indication of intended actions by the following sequence, which is not as easy as it seems. First the chimp looked at 5 objects on a table (which were photos of food, or tools like a key or screwdriver). Then the chimp walked around a screen away from the table and punched a symbol on a keyboard which it had previously learned corresponded to one of the objects (knowing the symbols for all 5). Then it returned to the table, picked up the object it had punched in, and walked round more screens to the hidden experimenter, to exchange its choice for approbation and reward. This may not be much, but it is a valuable attempt to check that symbol using animals really mean what they say.

There are many more chapters. Taken together they should help establish animal cognition as a topic capable of experimental investigation. The answer to the question of whether animals other than ourselves have any cognitive processes is "Yes". But no-one has clear answers yet to the more difficult questions of "which?", "what?", "how?", and of course "why?".