Books

The cellular basis of memory


Hi! I am the "scruffy, long-haired neurophysiologist who climbs mountains and builds health care facilities in Nepal when he's not sticking electrodes into cells ..." (at least that is how I described in this book). Presently, I am reading and reviewing this book high in the Karakorum Range, somewhere between Pakistan and China. Some of my scientific colleagues may suggest that this is the only place in the world to read it. I think, however, that they are wrong. This book has a number of redeeming qualities, not the least of which is the portrayal of scientists as real human beings (with warts and all!). The book is not without its faults and inaccuracies, but overall it is a reasonable account of a story behind the use of "simple systems" to study the neuronal mechanisms of learning.

The author tells in a reasonable manner how some of our ideas concerning learning developed and how we in the field itself developed (or did not develop). Many passages should make the reader sit back and ponder a scientist's role and attitudes. I realized how little I knew about my own scientific self, my attitude towards some of my scientific colleagues and competitors, and what we are all really striving to attain in our science. Although Allport poses questions that we neuroscientists need to answer, some of the answers that she suggests may not be what we want to hear.

The strong points of the book are the descriptions given of the two models of learning put forward by Eric Kandel's group and Daniel Alkon's group. I must say that the section on Alkon's model was superb, and if only Alkon could have explained it like that many of our lives would have been much easier. The description of the interaction between Kandel and his associates makes for some gossipy reading and shows how the "Kandelian" model of learning developed. In sketching this, Allport presents in a balanced manner how "Big Budget Science" and little science get along. She poses some fundamental questions regarding the proprietary nature of science.

A fair question to be asked is "Will a scientist who is not a neurobiologist working on mollusks be interested in this book?" Based on a very small sample size, I would say "yes." Will a nonscientist be interested? I think so, but I don't know whether or not he will understand certain passages.

The lay reader will discover, to some extent, why neuroscientists work long hours, have large egos, make lots of dumb mistakes, and yet tend to remain as excited as kids waking up early on Christmas morning. The reader will also discover the pettiness that sometimes exists. Of interest also, is the notion that some scientists who probe the mysteries of the mind, don't themselves want to be the focus of someone else's research.

There are some injustices done, mainly through omissions or inaccuracies. Important omissions are Bert Beretz and Dennis Willows. Beretz played a key role in the development of the Aplysia preparation and the importance of the peripheral nervous system in the mediation of gill behavior. Bert's challenges to the Kandel group and their response certainly helped the development of the field. Willows developed the in vivo molluscan preparation in which one can observe behavior and neurophysiology simultaneously. A major inaccuracy is the description of George Mptisos as a graduate student of Jack Davis. This was certainly not the case. Mptisos was a postdoctoral fellow in the lab of Don Kennedy at the time and provided much of the impetus for the excellent work on learning in Pleurobranchaea that the book ascribes to Davis.

Should you go out and buy the book? Yes. Even if you are not going to be stuck in a tent somewhere on the Chinese border, I've reread it at sea level—it is still good—so hypoxia and boredom were not the reason why I enjoyed it. This book might be required reading for graduate students, postdocs, and faculty who de-
sire to get into the biology-of-learning game. It is necessary to know the history of the major players and where they are attempting to go. One last thought, if the author sells the rights of this book to Hollywood, I am really in rough shape. Everyone else in this book is described as handsome, and I am the only scruffy one. But go and read the book, you will enjoy it.

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ALMOST HUMAN

Any new book by Jane Goodall is an occasion for some excitement. It was indeed with excitement that I opened this volume, the first comprehensive scientific monograph on her quarter of a century with the chimpanzees in Gombe National Park. A cursory examination alerted me to the extraordinary nature of this treatise. It was clear that some of her professional colleagues would sniff at the nearly total absence of statistical analysis, that the novice in primate behavior would find the detailed documentation daunting, and that many readers between these poles of professional stuffiness and popular narvet would find this volume mesmerizing. It is nothing less than the first ethnography of the Kasakela-Kahama Chimpanzee.

All facets of the lives of these 100 or so individuals merit attention: health and morbidity; disorders following death of the mother; sociability; social networks; travel patterns; finding food; cannibalism; cooperation in hunting; distributing meat; coalitions; functions of aggression; food sharing; grooming networks; dominance; mating patterns; incest; female sexual strategies; territoriality; separation and annihilation of a community; object manipulation; social awareness; and more. These subjects are documented fastidiously with tables, maps, graphs, and detailed examples. The treatment is specific and quantitative—the text burgeons with counts, rates, averages, and percentages—but it is not statistical. Documentation rests fundamentally on the telling anecdote, the lesson of which is then extended by means of quantitative information on the frequency of the situation portrayed.

The exhaustive documentation with only token statistical analysis is in fact an essential feature of the book. What emerges as one reads farther and farther into this treatise is not a statistical summary of these animals, but a sense of their individuality. The author's focus on the animals as individuals is, to be frank, appropriate for her data, since the generality of any statistical analysis of small samples from such highly diverse subjects would only be suspect. On the other hand, the author's focus on individuality goes far beyond propriety in treatment of her data. "My own special interest has been in individual differences," she admits at the outset (p. 59). From the beginning of her study, her focus on individuals has been her hallmark. She pioneered, following closely in the steps of the early Japanese primatologists, the procedure of individually recognizing and naming her subjects.

This emphasis on individuals has resulted in several of the Gombe chimps becoming nearly as famous as the author herself. The elderly matriarch Flo merited an appreciative obituary in the London Sunday Times. Readers of Goodall's earlier evocative book, In the Shadow of Man (J. van Lawick Goodall, Houghton Mifflin, Boston, 1971), will find in this present volume the subsequent histories of many old friends: can-rattling Mike's fall from the alpha position to the lower ranks of the males' hierarchy; Figan's steady climb to the alpha position; little Goblin's subsequent meteoric rise; Goliath's brutal death; and Fifi's tense sexual relations with her older brothers. Some have had larger roles in subsequent events than they had earlier, and there are some new faces.

The remarkable feature of the focus on individuals and the detailed documentation of their relationships is the sense that emerges of these animals as a social community. It is this aspect of the book that places it in the tradition of the best ethnography. All of the detailed information about these individuals comes to bear on the account of the split of the Kasekela-Kahama community and the subsequent brutal annihilation of the Kahama faction. Embedded as it is the context of so much individualized history, this section toward the end of the book makes a haunting tale.

This section also brings forth in stark relief the principal issue in research on the great apes: how nearly human are they? The work at Gombe and elsewhere in recent years has shaken our views of ourselves. As the author states, "man does not (any longer) stand in isolated splendor, separated from the beasts by an unbridgeable chasm" (p. 40). We now know that wild chimpanzees have taken the first steps in intelligent use of tools, in the sort of subtleties of social interaction that seem intentional to us, and even in the precursors of warfare. It is now easier than ever to agree with Robert Yerkes' conclusion nearly half a century ago, "The ape is at the beginning of a road on which man has advanced far" (Chimpanzees: A Laboratory Colony, Yale University Press, New Haven, 1943, p. 185).

A major unresolved question, though, concerns the relationship between recent discoveries of the language-like abilities of chimpanzees in captivity and their behavior in the wild. An early chapter in the present volume presents a review of studies that demonstrate abilities for insight, imagination, symbolic representation, displacement in time and space, inference of purposes in others, intentions, and a concept of