



International Society for Behavioral Ecology

Newsletter

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Editorial

Contents of this Issue

Editorial	1
Executive	2
Society News	3
Conferences, Grants and Jobs	4
Book Reviews	
<i>Defenders of the Truth. (Ullica Segerstråle)</i>	5-6
Review by Tim Birkhead	
<i>The Triumph of Sociobiology (John Alcock)</i>	6-7
Review by Ken Otter	
<i>Reproductive Biology of Bats</i>	8-9
(Elizabeth Crichton & Philip Krutzsch, eds)	
Review by Robert Barclay	
<i>Chance in Biology (Mark Denny & Steven Gaines)</i>	9-11
Review by Peter Bednekoff	
<i>The Cichlid Fishes (George Barlow)</i>	11-12
Review by Ulrika Candolin	
<i>The Cichlid Fishes (George Barlow)</i>	12-13
Review by Rui Oliveira	
Election of ISBE Officers	14-15
Ballot Form	16

ISBE Hits the Net

Over the summer the International Society for Behavioral Ecology made another advance; we have conquered the internet. Well, maybe not, but at least we have a webpage.

The new site is hosted on the University of Northern BC server under the following address:

web.unbc.ca/isbe/

At present, current information about the International Society for Behavioral Ecology is available on the site, as are copies of present and past newsletters.

Book reviews and suggestions are coming in fast and furious at the moment, and I would like to thank all contributors. In addition, I would like to thank all those who highlighted upcoming books for review, and invite future advance notices from society members.

Submission deadlines for the May/June Newsletter will be March 15, 2002 for all contributions (other than student forum articles – see page 3 - due February 15).

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Society News

DONATED SUBSCRIPTION PROGRAMME

Please help colleagues in need. Every donation will help increase scientific contacts across the world. In a time when nationalism is again raising its ugly head, this is more important than ever. For details, see the advertisement on the last page of the previous newsletter, or inside back cover of *Behavioral Ecology* volume 12(4).

SPOUSAL MEMBERSHIP

For \$5 per year spouses of full members can become members of ISBE. Spousal members receive the newsletter and information concerning biannual meetings, but do not receive a subscription to the journal. Contact the Treasurer for more details.

STUDENT FORUMS FOR NEWSLETTER

It is sometimes difficult for students to have a "voice" by which to express their ideas, despite these sometimes leading to major innovations in fields of research. The newsletter will begin accepting forum-style articles written by students. Deadlines for submission of these articles, which should not exceed 2500 words (excluding references), will be four weeks prior to the normal Newsletter deadline (February 15 for the spring issue, and August 15 for the Winter issue). Submissions will be reviewed by a subcommittee of the Newsletter Editor and society's executive. The top submission will be published as a fully refereed article in the Newsletter.

ISBE 2002 CONFERENCE

Luc-Alain Giraldeau and Don Kramer invite all members of the International Society for Behavioral Ecology to Montreal from July 7 – 12, 2002 for our 9th Biennial Congress.

The meeting will be held in the excellent facilities of the Université du Québec à Montréal located in the downtown core of this lively city. The 9th Congress will be the occasion of the first Hamilton Lecture, which will be delivered by Robert Trivers. There

will be a symposium on Ecology and the Central Nervous System featuring talks by Timothy DeVoogd, Reuven Dukas, Susan Healy, and Louis Lefebvre. Other plenary speakers who have agreed to attend are Nancy Burley, Frank Cézilly, Dorothy Cheney, Scott Creel, Jean-Louis Deneubourg, and Hanna Kokko.

The banquet will take place at the Sucrerie de la Montagne on Mont Rigaud west of the city. This location features a traditional "sugar shack" where syrup is made from sap extracted from maple trees in the early spring, as well as a taste of the traditional food and music of Quebec and a chance to explore an extensive patch of northern deciduous forest.

Montreal is a cosmopolitan city close to a variety of natural landscapes. Consider coming early to enjoy the atmosphere of Montreal during its world famous international jazz festival. Or stay on to visit Quebec City and explore the forests, hills and coastline of Quebec.

In this issue of the Newsletter, we have enclosed a poster advertising the meeting. Please post it prominently in your institution so that students and colleagues will be reminded of the meeting. If you want more copies, please contact Don Kramer.

Website: <http://www.isbe2002.uqam.ca>

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See you in
Montreal!

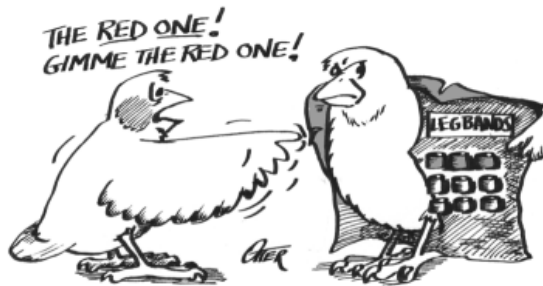


Sexual Selection in Primates

We are pleased to announce that the German Primate Center (DPZ) will host an international conference on primate socioecology from 11 to 14 December 2001. The focus of this meeting will be on sexual selection in primates. Invited speakers will summarize and evaluate recent empirical and theoretical work dealing with causes, mechanisms and consequences of sexual selection in primates, including humans. In addition, we hope to identify general principles through comparison with other mammals.

Additional details available from Peter Kappeler (pkappel@gwdg.de) and the conference web site:

www.dpz.gwdg.de/voe_page/GFT2001/freiland01C.htm



Ecological Immunology of arthropods - towards a theoretical evolutionary framework of innate immunity

European Science Foundation workshop

Ecological and evolutionary perspectives on immunity are providing radical new insights into the nature of the co-evolutionary processes underpinning host-parasite interactions, and the nature of life-history investment underpinning parasite mediated sexual selection. It is becoming increasingly clear that arthropods are the adequate model for studying the evolution and maintenance of immunity. This international workshop will be held in Sheffield, U.K. from December the 6th-9th 2001.

For scientific queries contact:

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www.shef.ac.uk/uni/academic/A-C/aps/index.html

Grants and Job

VOLUNTEER FIELD ASSISTANTS NEEDED FOR RADIOTRACKING TASMANIAN DEVILS: Enthusiastic volunteer field assistants are needed for a study of mating strategies in Tasmanian devils. Field trip dates are May 2001, November 2001, and mid-February to late March 2002. The study is located at Freycinet National Park on the east coast of Tasmania, Australia, a peninsula with mostly open, dry eucalypt forest, beautiful pink granite mountains and white beaches. Assistants are required to arrange travel to the field site; food and lodging will be provided at the site. Assistants will be radiotracking at night from fixed towers (involves camping on mountain tops) or from a vehicle. A good level of physical fitness is required, as well as

willingness and ability to function at night, in all weather conditions, and with irregular hours. Volunteers will need own bushwalking equipment (e.g. tent, stove). We will be comparing mating and non-mating season home range sizes and trying to determine the order of male consorts with oestrous females to match with genetic paternity data. The February – March trips, in particular, could be demanding as we will be trying to keep track of a large number of individuals during the mating season. Please contact Dr. Menna Jones (Division of Botany and Zoology, Australian National University, Canberra) by email menna.jones@anu.edu.au.

Book Reviews

Out there and in there: Defenders of the Truth: The Sociobiology Debate.

Ullica Segerstråle, Oxford University Press, 2000. 512 pp

ISBN 0-19-286215-4

This is an important book. Everyone in our society should read it for a brilliant and fascinating account of our subject. Ullica Segerstråle, who originally trained as a biochemist and later became a sociologist, has done us a great service by documenting in minute detail the birth and development of our area of science. But this is much more than a mere history of our subject, it is a case study of how science is done; a history of science, a history of a discipline and a delicious read.

The debate in question is more accurately the battle between left and right and the messy association between political views and science. 'Sociobiology' was the title which E.O. Wilson gave his book, published in 1975, which also defined a new way of integrating social behaviour, ecology and population genetics. 'Sociobiology' outraged the political left because they saw anything which linked genes and behaviour as constituting a form of racism which might lead to a re-run of what happened in Germany in the 1930s and 1940s. For them, saying that a behavioural trait was heritable was the same as saying it was unchangeable and that society is an accurate reflection of biology: biological determinism.

To Segerstråle 'sociobiology' is synonymous with discovering the true disposition of human nature. She likens her story to an opera, a story divided into various acts and with some key performers. E.O. Wilson has the lead role, naturally, and his main opponent is R. Lewontin, but there are numerous gossipy subplots such as the on-going Dawkins-Gould sideshow; the various altercations between Dawkins and Steven Rose - Lewontin's colleague and British counterpart; the tale of how Bob Trivers apparently saved Wilson from grave theoretical misunderstandings in 'Sociobiology', and how Pat Bateson and John Maynard Smith acted as essential referees in the whole messy, mud-wrestling debate.

Segerstråle covers other intriguing topics including a wonderful discussion of the political abuse of sociobiology, the Nabi episode, the moral reading of sociobiology and the idea of 'planters' and 'weeders' in science (which are you?). Even though I am now one of the old lags who lived and worked through the inception of sociobiology, I still learnt a lot from this account.

To me, Segerstråle's analysis of the sociobiology debate is similar to what was once another kind of public performance - a dissection - a beautiful dissection, like the ones Leonardo did; artistic, exquisite, reverential, and revelational. She carefully enters the body of the debate, paring away extraneous material with exquisite care to reveal and display the individual organs and their connections. Cautiously, but purposefully, she moves deeper and deeper, slicing through successive layers of obscuring tissues, structures and arguments until, having finally exposed the body with such thoroughness her audience is rewarded by a deep and penetrating understanding of the whole. A scientific work of art.

Despite the breath and depth of this wonderful book, I cannot help feeling that behavioural ecologists will be left wondering quite where they fit into Segerstråle's view of sociobiology. Don't let this put you off reading the book; I am more puzzled than critical that others should view our field so differently from the way we do. Indeed, thinking about why this might be so could be rather revealing. The critical difference is, of course, ourselves. Segerstråle sees sociobiology as dealing with humans rather than non-humans; any research findings based on non-humans which contributes to the sociobiology story is incidental and fortuitous. My puzzlement was increased by the fact that Segerstråle never really makes clear the link between 'sociobiologists' and 'behavioural ecologists': in some places she implies that we are all the same, in others that we are

fundamentally different. Behavioral ecologists also get short shrift in the grand scheme of things. We would, I am sure, like to think that we had played a major part in the sociobiology debate. Of course, our society had not been formed when the debate started, but even in Chapter 16 which reviews the situation 25 years on and where other intellectual sociobiology outgrowths are described, the ISBE doesn't get a mention. Hmmm.

In skirting the behavioral ecology-sociobiology issue Segerstråle does however touch on a particularly fascinating difference between what she sees as the British behavioral ecologists and the North American critics of sociobiology. What intrigues her is that right from the start British scientists read Dawkins 'right'. They knew, almost intuitively, that Dawkins was simply trying to convey the logic of natural selection and had no hidden political agenda. Indeed, behavioral ecologists in Britain felt that the sociobiology controversy actually had to be imported from North America. Segerstråle's view is that the defining feature of whether you are pro- or anti-sociobiology (or behavioral ecology) is whether you are a naturalist or not. The naturalist, be it a bird-watcher, a butterfly fanatic or an ant enthusiast, has a deep love of nature and deep desire to try to explain the natural world and she holds the late W.D. Hamilton

up as the exemplar of this approach. The British behavioral ecology tradition has its roots in natural history, whereas the North American critics of sociobiology, like Lewontin, were hard-nosed laboratory-based geneticists with no basic desire to understand the natural world, simply a hard-nosed desire to understand genetics. Segerstråle links Dawkins' approach with that of his supervisor, Niko Tinbergen (another field naturalist, albeit Dutch) and back still further with the Victorian rural clergyman naturalists. In other words, the basic difference between the two sides in this debate is between the rural scientist - who believes that the truth is 'out there' waiting to be found by curious naturalists' - and the urban scientist who believes that the truth lies 'in there' - in the 'controlled conditions of the laboratory'.

The critics of sociobiology were wrong, but Segerstråle stresses that the debate has been useful for the field because it forced behavioral ecologists and sociobiologists alike to be absolutely clear what they meant. Read it.

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The Triumph of Sociobiology

John Alcock, Oxford University Press, 2001. 257 pp.

ISBN 0-19-514383-3

The suggestion that evolution has shaped human behaviour equivalently to that of other animals is often paramount to opening Pandora's box. However, it is this project that Alcock has tackled head on in his enlightening new text, *The Triumph of Sociobiology*.

The text begins with a history of the controversy started by E.O. Wilson's seminal text *Sociobiology* - Alcock distinguishes the current usage of the term as the subset of behavioral ecology which deals primarily with the evolution of human behavior. For those, like myself, who were not in the field during this historic period, it provides a fascinating read of the opposition to the idea that human behaviour

could be partly influenced by evolutionary processes. Alcock details the opposition from activists, sociologists and even evolutionary biologists, many of whom opposed Wilson's ideas by failing to understand that a genetic basis to behavioral evolution does not equate behaviors to being genetically fixed.

Much of the early part of the book is devoted to the concept familiar to most behavioral ecologists; that both genetic and environmental (the latter often used synonymously with "cultural" in this book) influences contributions to behavioral variation. In addition, Alcock underscores that behavior must be viewed both on its proximate mechanisms and

ultimate adaptive value. One of Alcock's primary assertions is that much of the misunderstanding surrounding sociobiology is the failure by critics to distinguish proximate and ultimate explanations for behaviour.

Alcock uses several chapters in the book to detail the findings of behavioral ecology over the last few decades, pointing to behaviors that have direct homologues with humans - sperm competition, extra-pair behaviour, divorce, parental care, cooperative behaviour, etc. Much of this is familiar material to a behavioral ecology audience, but provides a basis for those outside the field, particularly sociologists and others who might think to challenge this text.

The most interesting chapters are those counterarguing the points made by critics of sociobiology. These begin with challenges to Cultural Relativists, whose position is that every world view on a subject is equally valid. Alcock makes a pretty convincing argument - although one to the already converted in my case - that scientific methodology follows a cross-cultural process of observation, deduction and testing that is easier to validate than many other world views advocated by cultural relativists. As a result, all views are not equal in Alcock's mind, with sound, scientific inquiry being a more valid mechanism of examining behavioral variation than alternate approaches.

Alcock also challenges the views of Cultural Determinists, who assert that apart from the rudimentary development, the brain is a "blank slate" and cultural learning dictates adult behaviour.

Citing studies of common patterns of behaviour across cultures, such as perceptions of attractiveness, attitudes towards maintenance of premarital virginity in females, and even genocide, Alcock makes a strong case that unconscious proximate sensory cues can be influenced by evolutionary processes. However, due to the interactive nature of genes and the environment on shaping behavioral development, these behaviors are neither genetically fixed, nor are they solely the result of cultural input. Perhaps his most convincing arguments on this latter point comes from the chapter "Sociobiology and Human Culture". Here, Alcock counters the "blank-slate"

brain theory with evidence that brains are neurally wired to bias learning toward particular sensory inputs and patterns that are evolutionarily advantageous to the bearer. Such genetic predisposition towards learning would clearly invalidate the blank-slate hypothesis.

Alcock's text is a triumph in itself. It is not only insightful, but provides a convincing argument for the role of evolution in helping shape human behaviour. Yet among its greatest attributes, in my opinion, is the caveat that it sets. Among behavioral ecologists and sociobiologists, it is understood that behaviors partially shaped by evolutionary advantages conveyed on the bearer of particular genes *does not* advocate these behaviors to be morally acceptable. Alcock calls sociobiologists to make this distinction clear in their research and reporting, and go so far as take the responsibility to attack misinterpretation in public forums. This is an imperative distinction that will lend both validity to the study of sociobiology as well as quell criticisms of the discipline by politically and morally motivated attackers. Alcock spends much of the final chapters arguing that by understanding that evolution has, in the past, favored predispositions towards particular patterns of behavior, it may even help us to *override* these unconscious and antisocial behaviors, a view also put forth by previous authors. One contentious example provided is whether an understanding of the evolved male psyche to reproduce at all cost (which has been proposed to lead to extreme conditional strategies, such as rape), may enable us to counteract this occurrence by educating students on recognizing these proximate responses to stimuli. This opinion is sure to raise a few eyebrows - and probably elevate the temperature of some critics - and may fail to be practical, but Alcock's ideas are sure to re-spark interesting debates.

On a personal note, I can't wait to show this to my sociologist colleagues.

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Reproductive Biology of Bats.

Elizabeth G. Crichton & Philip H. Krutzsch (eds.) Academic Press. 2000. 510 pp.

ISBN 0-12-195670-9

Reading this book, one is continually reminded of, and impressed with, the tremendous diversity of bats. With over 950 species distributed virtually worldwide and making up one-quarter of all mammal species, bats are diverse not only taxonomically, but also physiologically, ecologically, and behaviorally. This diversity should provide ample opportunities to incorporate research on bats into broader perspectives on the evolution and ecology of mammalian reproduction. Yet, as pointed out by both the editors and almost all the authors, this has been hindered by only a relatively small number of bat species having been studied in any detail. Until now, there has not been a thorough review of their reproductive biology. The editors' goal was to produce such a summary. All of the chapters in the book accomplish this; the coverage at times is exhaustive. The best chapters, however, go beyond merely summarizing current knowledge; they develop novel ideas, analyze and synthesize the literature in search of pattern and causation, and suggest future avenues for productive research. I believe those chapters of particular interest to behavioral ecologists are among the best at this.

The book is comprised of 11 chapters authored by a total of 16 researchers. Like bats, the chapters are diverse, covering everything from endocrinology and anatomy to life histories. Indeed the book is organized much like the hierarchical levels of biology, from molecules (endocrinology) to the bigger picture of environmental regulation of reproduction. While almost all chapters contain information of potential interest to behavioral ecologists, the last five are probably most relevant. These deal with sperm storage, mating systems, life history and reproductive strategies, parental care and postnatal growth, and environmental regulation. There are also useful species and subject indices.

Long-term storage of sperm (up to six months) is relatively common in both male and female bats, and as Elizabeth Crichton points out in her chapter, this is unusual amongst mammals and has important implications for mate selection and sperm

competition. Sperm storage is associated with the temporal separation of behavioral estrous and ovulation present in many species of bats, particularly those in temperate zones. Len Martin and Ric Bernard present a thorough synthesis of the unique hormonal control required to orchestrate such reproductive timing, and I appreciated their synopses of typical mammalian patterns into which they placed patterns found amongst bats. They summarize an extensive literature in a large table, a technique a few chapters would have benefited from rather than resorting to long lists of species and references that broke up the flow of the text.

One of the most stimulating chapters is that by Gary McCracken and Gerald Wilkinson on mating systems. It makes a worthy successor to the last review of the subject published almost 25 years ago (Bradbury 1977). The authors start with a synopsis of that review and then focus on what we have learned in the subsequent 24 years and where they believe we should head in the future. They too point to sperm storage as an aspect of bat biology that deserves greater attention. But they also point out that of the 66 species for which mating systems are known (again revealing the paucity of knowledge), one-quarter are monogamous, a mating system not common in other mammals. As they, and Thomas Kunz and Wendy Hood (Parental Care and Postnatal Growth) indicate, paternal care is expected to be most common in monogamous species, yet almost nothing is known regarding this aspect of bat behavior. The fact that males of one species of fruit bat apparently lactate (Francis et al. 1994) should stimulate interest in paternal care among bats. Kunz and Hood nicely review aspects of parental care (e.g. mother young communication and individual recognition), and then deal with inter- and intra-specific variation in growth and parental investment.

Life History and Reproductive Strategies of bats are reviewed by Paul Racey and Abigail Entwistle. Although they begin with a useful, up-to-date review of life history theory, and place the unique life history of bats into the broader picture, this part of

the chapter is relatively brief. The bulk of the chapter summarizes what is known about such aspects of bat reproduction as reproductive timing and seasonality, reproductive delays such as delayed fertilization, and hypotheses as to what limits bat reproduction. While reading this chapter I was struck by the emphasis on temperate-zone species compared to tropical ones. While the bulk of bat diversity resides in the Neotropics and Paleotropics, half of the over 200 references cited in this chapter deal with studies on temperate-zone species. The same is true for many of the other chapters. This is not the authors' bias, but is a reflection of the biased geography of research to date. It does, however, give a somewhat distorted view of bat reproduction.

Paul Heidemann's chapter on Environmental Regulation of Reproduction, gives tropical species the attention they deserve, and he speculates about environmental cues responsible for their reproductive timing, while focusing on photoperiod and temperature as triggers for temperate species.

In general the literature covered by the book is relatively up to date, although it does vary. A few chapters include one or two references as recent as 1999, but most stop in 1997 or 1998. The chapters also vary considerably in the style of presentation. Those that succeed in getting their message across the best, stayed away from somewhat tedious species-by-species accounts. The figures and tables enhance the text, and the graphical and

photomicrographic figures, with one or two exceptions (fuzzy line drawings and faint shading), are of high quality.

Overall, this is a very worthwhile and informative book to have in your institution's library. Given the breadth of biological topics but narrow taxonomic focus, however, it is one that relatively few behavioral ecologists, or other biologists, will likely read from cover to cover. If it stimulates incorporation of information on bat reproduction into broader analyses of the ecology and evolution of reproduction, and encourages researchers to fill the considerable gaps in our knowledge regarding bat biology, it will have satisfied the editors' goals.

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References

- Bradbury, J. W. 1977. Social organization and communication. in *Biology of Bats* (W. A. Wimsatt, ed.). Vol. III. Pp. 1-72. Academic Press, New York.
- Francis, C. M., E. L. P. Anthony, J. A. Brunton, and T. H. Kunz. 1994. Lactation in male fruit bats. *Nature* 367: 691-692.

Chance in Biology: Using Probability to Explore Nature

Mark Denny & Steven Gaines. Princeton University Press, 2000. 291 pp

ISBN 0-69-100521-4

This book is fun. It was "hatched over a pitcher of beer at the 1992 Benthic Ecology Meeting (p. xi)" and exhorts biologists to embrace stochastic processes as important components of living systems. The authors hope to give readers "a glimpse of the joy to be had in bringing order out of chaos...(p. xii)". In my opinion, they succeed in this and also explain difficult topics with remarkable clarity. Because the authors only take on topics that

they care deeply about, I will first sketch out the contents of the book.

After a brief preface, Chapter 1 explores The Nature of Chance. This chapter starts with surprising finding that spider silk get shorter when heated then explains that the remarkable stretchiness of spider silk is due to the disorderly aspects of its structure. The chapter concludes with general characterizations of determinism, chance, and chaos.

The next three chapters deal with standard probability topics, though the treatment is wonderfully non-standard. Chapter 2, Rules of Disorder introduces two improbable organisms--sarcastic fringeheads and bipolar smuts--that are used repeatedly in examples. The chapter includes a superb derivation of Bayes formula and its application to HIV testing. Chapter 3, Discrete Patterns of Disorder and Chapter 4, Continuous Patterns of Disorder, build up the principles of probability distributions. I found the progression of topics thoughtful and effective. For example, uniform and binomial distributions are standardized along the way to the standard normal curve. Appendices provide informal derivations of the normal distribution from the binomial and for the central limit theorem.

Chapters 5 and 6 present Random Walks and More Random Walks. General principles are explored using a wide range of biological examples including receptors on cells, mixing of plankton, elastic ligaments, and genetic drift. I found these two chapters slow going when I first read them, but this was probably due to my unfamiliarity with the subject area. The second time around, I found them clear and very well organized.

Chapter 7 explores The Statistics of Extremes. It starts with the specific problem of whether conversations at a cocktail party could combine to shatter eardrums, then moves on to general principles. These principles are applied to data from human life spans and from baseball. Over the past few years, I have tried to learn about the statistics of extremes from various sources. Reading this chapter allowed me to understand the overall structure for the first time. I wish that I had read this chapter before touching anything else.

Chapter 8 deals with aspects of Noise and Perception. After working through aspects of visual systems, ion channels, and hearing, the authors introduce the possibility of stochastic resonance. Under some conditions, a moderate amount of noise can increase the signal to noise ratio of the detected signal. Furthermore, organisms may often take advantage of stochastic resonance to help them detect weak signals. This final topic cleverly reinforces the overall message the authors want to convey.

Throughout these topics, the authors maintain the highest standards of enthusiasm and clarity. As an example of enthusiasm, here is the authors' reflection on the binomial distribution: "When you think about it, this is a really nifty result. No longer do we have to go through the tedious procedure of enumerating the sample space and noodling out what probability to assign to each outcome. We now have a compact formula that does most of the work for us (p. 55)." The clarity comes through a deft feel for the mathematical limits of interested biologists. I cannot directly describe how the authors work within those limits, but offer two quotes that indirectly demonstrate their methods. The first shows that the authors are honest in what they present--"The Central Limit Theorem is a powerful tool, and we wish we had an intuitive explanation for why it should be true. Unfortunately, we don't (p. 83)." The second quote shows that they are prudent--"This can be done, but the mathematics is tortuous, so only the final results are presented here (p. 185)." The authors' honesty and prudence will be appreciated by readers.

Who should read this book? I recommend it as a overview of essential topics, an introduction to advanced topics, and as a flat-out well-crafted book. The first four chapters offer something for everyone who uses statistics. This book will not help you calculate an ANOVA or P value, but it could help you better understand what you are doing. I can vouch that the unique treatment deepened my understanding of topics that I had known and taught for years. From Chapters 5 through 8, I recommend sampling according to interests. This book could profitably be read from cover to cover by a seminar class but most biologists will be more interested in some of the advanced topics than others. This unconventional book is not designed to be the main text for any conventional course, but could be a supplement to many. I will keep the book close at hand when teaching statistics to biologists. Many of its derivations, examples, and problems will displace my lesser efforts.

Finally, I hope that many scientists buy this book because it is exceptionally well-crafted. The production value is consistently superb but what I admire most about this book is its wealth of small gems: vibrant paragraphs, amusing details, and a

wide variety of jokes and puns. For example, the footnote at the bottom of p. 18 gives both a pun, "Venn in doubt, draw a diagram." plus the tidbit that John Venn later invented a device for bowling

cricket balls. If this much care is taken on a footnote, think what the rest of the book is like.

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The following is two perspectives on the same book

The Cichlid Fishes: Nature's Grand Experiment in Evolution

George W. Barlow, Perseus Publishing, 2000. 335 pp.

ISBN 0-73-820376-9

Cichlid fish stand out among other taxa in their high diversity and their complex social and mating systems. Thousands of species with different behavioral and morphological adaptations have evolved within a relatively short time in the Great Lakes of Africa and more species occur in South America. In this easy-to-read book George Barlow tells us about the behavioral ecology, and especially the reproductive behavior, of this amazing group of fish. Cichlids are exceptional in that they show all the mating systems known to vertebrates. This diversity, and hypotheses of how it might have arisen, are presented in an enthusiastic way that reveals Barlow's knowledge and great love for the fish.

Barlow starts with a brief overview of the feeding behavior of the cichlids focusing on their highly specialized jaws. The jaws allow them to exploit a wide range of food sources, which might explain why they have been so successful in inhabiting different habitats and in the radiation of new species. Barlow then describes the different forms of sex determination, which is often more flexible than in other vertebrates. Apart from environmental sex determination of offspring, females in some species can change to males as they grow bigger or when males are in short supply.

The emphasis of the book is on the different mating systems and the mechanisms and adaptations of mate choice. Cichlids are famous for their bright colors, but many other traits such as courtship behaviors, body size and nest characteristics also influence mate choice. Special attention is given to unusual

breeding adaptations, such as: females that breed within shells collected by males - which, in this species, are 12 times heavier than the females - and lekking fish that build large, energetically expensive bowers to attract females. Great diversity also occurs in spawning behavior and Barlow describes many unusual adaptations. An interesting pattern occurs in some mouth brooders, where males have egg dummies on their fins that increase the male's fertilization success as the female sucks up sperm when she tries to pick up the dummy eggs.

What often attracts humans in cichlids is their parental behavior and devotion to family. Due to the conflict of interest between the sexes, monogamous systems are unusual and polygamy or cuckoldry is the rule among other vertebrates. Barlow explains why monogamy in some cases is the optimal solution in cichlids, with the parents remaining faithful as long as the offspring need their care and protection.

Towards the end of the book, the factors that may have promoted the unusual diversification of cichlids in the Great Lakes of Africa are explored. The importance of allopatric speciation, with patchy habitats separated by hostile conditions favoring speciation, is emphasized, whereas the importance of sympatric speciation and sexual selection is quickly dismissed. However, this book, as Barlow points out, is not about speciation and how it might have arisen.

This subject this would deserve an entire, separate book. The current text is more a detailed description of what speciation has resulted in: an account of the diverse behavioral adaptations of cichlids. Finally,

the book ends with an overview over the worrying future of the cichlids, with overfishing, changed water chemistry and the introduction of new species threatening their existence. How the future will turn out largely lies in the hands of mankind.

If some criticism has to be raised it would be that sometimes too many examples are presented at the cost of more information on other examples. This occasionally makes it hard to see the big picture, how the diversity has evolved in interplay with the ecology. Only rarely are the different behavioral specialization related to the ecology of the habitat. However, this may largely be due to our ignorance of how the great diversity has evolved – large gaps in our knowledge still exist, which prevents a more comprehensive synthesis. Some researchers may also disagree with Barlow in his strong dismissal of the possibility of sympatric speciation and the role that sexual selection may have played.

Nonetheless, this book is a rich source of information on cichlid behavior and will surely be an important reference book to cichlid researchers and hobbyists as well as to anybody interested in the

evolution of mating behaviors and social systems. Complex theories and ideas in evolutionary biology are explained in an unusually clear way. The most important use of this book will probably be in inspiring new research. One can hardly turn a page without getting a new research idea. Sometimes the ideas are explicitly stated by Barlow, but more often they are indirectly hinted at in the text. This gives the reader the possibility to formulate the exact question himself and figure out the best research plan. This will invariably result in many different solutions and research ideas and thereby promote a diverse research approach, which is how science should proceed. Without doubt, this book will do much in stimulating new research and increase the importance of the fish group as a model system in behavioral and evolutionary ecology studies.

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The Cichlid Fishes: Nature's Grand Experiment in Evolution

George W. Barlow, Perseus Publishing, 2000. 335 pp.

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Cichlid fishes are among the most diverse living taxa both in terms of the number of species and the diversity of their behaviour. They have become a classic example in evolutionary biology and, had Darwin been travelling in the Great Lakes of Africa instead of sailing to the Galapagos Islands, they most certainly they would have inspired him as much as the Darwin's finches did.

In this book George Barlow shares his love and enthusiasm of cichlid fishes with the reader. It is written in a popular science style and technical terms are either avoided or explained which makes it very accessible not only to the specialist but to the lay person as well. The book is organized into an introduction followed by 13 chapters, plus a glossary of biological terms at the end. The ethological background of the author is reflected in the structure

of the book. Five out of the 13 chapters deal with different aspects of cichlid behavioral biology in an evolutionary framework.

The introduction sets the stage for the following book chapters. Using a simple comparison between tropical reef fishes and cichlids, Barlow elegantly demonstrates cichlid fishes are by far more numerous and diverse in their habits.

In the first chapter the author introduces the reader to the taxonomy of fishes and defines the specific morphological characters of cichlid fish and their geographical distribution. Although this may sound a tedious chapter the author manages to present the facts in a very vivid way that keeps the reader attention. As an example, Barlow relates the story of the man who choked to death when, as a joke, he

tried to swallow a Jack Dempsey - the story may have had a happier ending had the unfortunate performer been more keenly aware of fish taxonomy (it would have worked with goldfish, Barlow points out!).

The second chapter reviews the diversity of feeding habits of cichlids and explores the idea that the pharyngeal jaw of cichlids may explain their evolutionary success. In the third chapter the reader is confronted with the environmental sex determination mechanisms of cichlids, that can be controlled by social status (i.e. dominance relationships), temperature or even pH.

From the fourth to the eleventh chapter the behavior of cichlids is described in a great detail. The fourth chapter is about mating systems and again the wide variation of mating habits in cichlids is reviewed. In fact, cichlid fishes are one of the most diverse, if not the most diverse, family of vertebrates when it comes to mating strategies. Strategies range from monogamous-biparental to lekking-promiscuous species, which offers a beautiful opportunity for conducting comparative studies among closely related species, one that has not been explored often enough. Chapter five concentrates in aggressive behavior (mainly between males). The occurrence of feeding territories in cichlids is discussed and the fighting behavior is analyzed in the framework of conflict escalation and information gathering during fights. The following chapter (Chapter six) deals with the signaling behavior and, although acoustic behavior is also covered, special attention is paid to visual communication. Chapter seven looks at sexual selection and sex discrimination in cichlids. The building behavior of nesting structures and the evolution of spawning pits, named bowers, in the context of species-recognition during mating is discussed. In chapter eight the topic of monogamy and pair bond formation is examined and again the problems of species recognition and sex discrimination are discussed. Then chapter nine is a thorough review of spawning behaviour, in which particular attention is paid to the specialized modes of fertilization that have evolved in cichlids. For example female African mouth-brooding cichlids suck sperm from the male's genital papillae into their mouth and fertilization occurs inside the

female's bucal cavity. Apparently, males of these species have evolved ornaments in their ventral area to guide females in this behavior, such as an elaborated tassel in the genital papillae or eye-spots in the anal fin that mimic eggs. This chapter ends with an overview of sperm competition and male alternative mating tactics. Chapters ten and eleven look at parental behavior. Topics discussed in these two chapters include the sharing of parental investment between the sexes, fry behavior and parent-fry interactions, alloparental behavior, the occurrence of crèches, helpers at the nest and catfish cuckoos that exploit the parental abilities of some cichlid species (female catfish lays their eggs in cichlids nests and catfish eggs hatch earlier and the fry eats the cichlid larvae).

Chapter 12 deals with the evolutionary biology of cichlid fishes, in particular with the cichlid assemblages of the Great Lakes of Africa. The roles of sexual selection and trophic specializations on speciation are carefully discussed. Evidence for the occurrence of three separate cichlid radiations, with similar species being "reinvented" in each of the three lakes, is presented.

In the last chapter the author draws the attention of the reader to the conservation problems that cichlids are currently facing. The case of the introduction of the Nile perch in Lake Victoria and its impact in cichlid biodiversity in the lake is used as an example.

Considering the length of the book, the reasonable quality of the drawings and the fact that it includes color plates that help to illustrate the many examples used in the text, the book is not expensive. However a paperback edition in the future may help it to reach an even wider audience. Overall this is a highly readable book that has the merit of conveying scientific arguments in an understandable way to a wide audience. There are other recent publications in cichlid biology but none has covered the behavioral ecology of this group in such an accessible manner.

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Election of ISBE Officers

Every two years, the ISBE elects new officers, whose term begins at the next society meeting. Below, we provide brief biographical summaries for all candidates. **The ballot and voting instructions are on the last page of this newsletter.** Everyone receiving this newsletter is eligible to vote.

(1) Candidates for PRESIDENT-ELECT (to become PRESIDENT at the 2004 meeting, and to serve in that capacity for two years).

Jack Bradbury

BA Reed College 1963; PhD Rockefeller University 1968. Currently R.G. Engel Professor of Ornithology, and Director of the Macaulay Library of Natural Sounds, Cornell University. My research has focused on mating systems, animal communication, or spatial pattern, and most often, on overlaps between these topics. Focal taxa include both micro- and megabats, various lekking birds, gazelles, opisthobranch gastropods, and most recently parrots. I tend to pursue general problems more than specific taxa. While essentially a field person, my attraction to overlap issues has led to enjoyable (at least to me) mixes of biology with physics, geometry, and computer modelling.

David Queller

My research interests encompass a variety of organisms and approaches. I have studied the behavioral ecology of plants (sexual selection on flowers, kin selection on the endosperm) and social insects (life insurance theory, relatedness estimation, genetic conflicts). I also work on theoretical models of social evolution. I am currently most excited about new work on cooperation and cheating in slime molds. Other activities include poking fun at S.J. Gould (Spaniels of St. Marx) and a projected book about why political conservatives should become committed environmentalists. Honors include a NATO postdoctoral fellowship, an ASN Young Investigator Prize, and a Guggenheim Fellowship.

(2) Candidates for SECRETARY (to take office in 2002 and serve a 4-year term).

Patricia Schwagmeyer

I received my Ph.D. from the University of Michigan in 1979, and I'm currently a Professor of Zoology at the University of Oklahoma. My research interests are in mating systems, parental care, sexual selection, and evolutionary aspects of communication. I've worked mainly with thirteen-lined ground squirrels and house sparrows, although I currently spend quite a bit of time monitoring the antics of four boxers, as well.

Paul I. Ward

My main interests are the evolutionary relationships between behavioral ecology, morphology and physiology, particularly sexual selection. Cryptic female choice in yellow dung flies is my current focus. After my PhD (1983) with Geoff Parker on plasticity of reproductive behaviour in an amphipod I did four postdocs in Germany and the UK. I worked on a variety of topics and species, from social behaviour in spiders to coloration in fish. Since 1988 I have been Professor of Zoology in Zurich. I was the main organiser of the Society's 2000 meeting.

(3) Candidates for COUNCILLOR (2 positions vacant, to serve 4 year terms from 2002).

Isabelle M. Côté

My research interests span the evolution of social behaviour, mating systems, and conservation of fishes. Most of this work involves the hardships of working in the Caribbean, where my students and I are studying the symbiosis between cleaning gobies and fishes that visit them. Empirical studies, combined with theoretical collaborations, are taking advantage of these symbioses as a model system for understanding the evolution of cheating and honesty. I am also interested in the interaction between behaviour and conservation, via the effect of

behaviour on population dynamics. For example, I have been studying an endangered freshwater fish in Spain to understand how nest site preferences affect vulnerability of populations to loss. I have also used meta-analyses to review the effectiveness of tropical marine reserves for conservation. I am currently on faculty at the University of East Anglia, Norwich (U.K.).

Yoh Iwasa

Professor of Theoretical Biology, Kyushu University, Japan. During the last 10 years, I have been working on the evolution of mate preferences. In collaboration with Andrew Pomiankowski, I succeeded in formalizing Fisherian runaway, the potential evolutionary cycles of ornament, and Zahavi's handicap idea in a very simple quantitative genetic formalism. Other topics of my research include the use of information and dynamic decision making in optimal foraging and in oviposition behavior of insects, genomic imprinting in mammals, life history evolution in fluctuating environments, and step-wise games of parental care and mate preference.

Hanna Kokko

I received my Ph.D. from the University of Helsinki (1997), looking at sexual signalling in a life history context and the evolution of lekking. Since then I have worked in Cambridge and Glasgow on the evolution of parental care, cooperative breeding,

habitat selection and dispersal, but I also find myself unable to leave sexual selection. I work mainly on the theoretical side, but my models "tend to have feathers". Apart from collaboration with field ornithologists I am also starting experiments on territoriality and dominance in fish. I am currently a Royal Society Dorothy Hodgkin Research Fellow at the University of Glasgow.

Nina Wedell

I received my PhD from University of Stockholm, Sweden in 1993. After a post-doc at Liverpool University, I returned to Stockholm until 2000 when I moved to Leeds to take up a Fellowship from the Royal Society. My research is focused on sexual selection, particularly why females mate as few or as many times as they do, and the consequences this has for sperm competition, sexual conflict, and mating system evolution. I am also interested in life history evolution and life cycle regulation in seasonal environments. My work is based on insect model systems with the aim of understanding behaviour from a genetic perspective.



ELECTION OF ISBE OFFICERS

Please mark your chosen candidates with a cross
(see pages 14 & 15 for information on each candidate)

(1) PRESIDENT ELECT

Jack Bradbury ☐

David Queller ☐

(2) SECRETARY

Patricia Schwagmeyer ☐

Paul Ward ☐

(3) COUNCILLOR (vote for two candidates)

Isabelle Côté ☐

Yoh Iwasa ☐

Hanna Kokko ☐

Nina Wedell ☐

Return ballot slips to:

**Malte Andersson, Department of Zoology,
Göteborg university, Box 463, SE 405 30 Göteborg, Sweden.**

(Closing date: one month after arrival of this newsletter.)