



# NEWSLETTER Animal Behavior Society

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A quarterly publication

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## ABS RESEARCH AWARDS

This year we received 40 outstanding applications for ABS Research Awards. Only eight could be funded. We congratulate those who were funded and thank all applicants for their efforts in applying.

Allison Abell, University of Chicago. "Sexual selection in the striped plateau lizard (*Sceloporus virgatus*): molecular evaluation of behavioral estimates of mating success".

Michael Armstrong, Binghamton University. "Population differences in red-winged blackbirds' defense against brown-headed cowbirds".

Marc S. Dantzker, Duke University. "Disputing the lack of sexual selection on male mating calls in the genus *Bombina*".

Todd M. Freeberg, Indiana University. "Experimental approaches to studying cultural transmission of mate recognition system behaviors in brown-headed cowbirds".

Julie C. Hagelin, University of New Mexico. "Sexual selection, plumage ornamentation, and parental care in two species of New World quail".

Susan M. Kain, Cornell University. "The adaptive significance of variable reproductive behavior in the water strider *Limnoporus dissortis*".

Ken Otter, Queen's University. "Mixed reproductive strategies of female black-capped chickadees".

Denise S. Pope, Duke University. "The function of the fiddler crab claw waving display".

## TRAVEL FUNDS FOR THE INTERNATIONAL ETHOLOGICAL CONFERENCE, HONOLULU

The United States Ethological Conference Committee has applied for a travel grant from the National Science Foundation to provide partial travel support for more junior ethologists to attend the International Ethological Conference meeting in Honolulu in August, 1995. If the funds are received, they will be used to support ethologists who have received their Ph.D. between 1990 and 1995 or who expect to complete Ph.D.s in 1995 and who are US citizens or residents. To apply for a travel award, submit the following to Dr. Charles T. Snowdon, Dept. of Psychology, University of Wisconsin, 1202 W. Johnson St., Madison, WI 53706-1696 to be received no later than June 1995:

- (a) 7 copies of a 1 to 2 pg. curriculum vitae
- (b) 7 copies of the abstract you have submitted for consideration by the Conference
- (c) Two letters of nomination that address the applicant's expected contribution to and benefit from the Conference, either sent with the application in sealed, signed envelopes or sent separately to arrive by June 1.

We will notify applicants of the funding outcome as soon as possible, although checks may not be sent until just before the meeting. Travel reservations should be made before notification of funding. If you have questions contact Charles Snowdon at (608) 262-3974 or SNOWDON@MACC.WISC.EDU.

## 1995 ABS ANNUAL MEETING

The ABS annual meeting will be held from the 8-13 July at the University of Nebraska in Lincoln. For information, contact Dr. Al Kamil, School of Biological Sciences, Manter Hall, University of Nebraska, Lincoln, NE 68588-0118, USA.

## 1996 ABS ANNUAL MEETING

The 1996 ABS annual meeting will be held from the 3-8 August at Northern Arizona University, Flagstaff, AZ. For information contact Con Slobodchikoff, Dept. of Biological Sciences, Northern Arizona University, Flagstaff, AZ 86011, USA.

## IN SEARCH OF MEETING SITES

Sites for ABS meetings are needed for **1997, 1998, 1999**. Anyone wishing to host one of our meetings should contact Hugh Dingle to discuss requirements and to receive further information. We are especially interested in meeting sites in the eastern USA and in Canada given the recent geographic locations of our meetings.

### ABS NOMINATIONS FOR 1995 ELECTION OF OFFICERS

Elections will be held this year for the following ABS offices: Second President Elect, Secretary, and Member-at-Large. The slate of nominees provided by the ABS Nominating Committee will appear in the August Newsletter. The election ballot will be published in the November Newsletter. Additional nominations may be made by letter to the Nominating Committee Chair Zuleyma Tang-Martinez, Department of Biology, University of Missouri, St. Louis, MO, 63121, USA. Nominations must be signed by five or more ABS members in good standing (ABS Constitution, Article 8, Section 1) and must be received by June 10, 1995.

## ABS IN THE NEWS

**Lee Dugatkin**, winner of the ABS Outstanding New Investigator Award in 1994, has recently been featured in articles in a number of newspapers for research conducted in collaboration with R. Craig Sargent at the University of Kentucky, Lexington. The ABS award was mentioned in both the Columbia Daily Tribune and the St. Louis Post-Dispatch. The research that generated the attention was: Dugatkin, L.A. and R.C. Sargent 1994. Male-male association patterns and female proximity in the guppy, *Poecilia reticulata*. Behav. Ecol. Sociobiol. 35:141-145.

## DIRECTION OF CORRESPONDENCE

**ABS Newsletter** and general correspondence concerning the Society: Susan Foster, Dept. of Biological Sciences, University of Arkansas, Fayetteville, AR, 72701, USA. Deadlines are the 15th of the month preceding each Newsletter. The next deadline is July 15, 1995.

Articles submitted by members of the Society and judged by the Secretary to be appropriate are occasionally published in the ABS newsletter. The publication of such material does not imply endorsement by the ABS of the opinions expressed.

**Animal Behaviour**: manuscripts and editorial matters: Animal Behaviour Editorial Office, University of Washington, 119 Guthrie Hall, Box 351525, Seattle, WA 98195-1525, USA.

**Change of Address**: missing or defective issues of *Animal Behaviour*: Randall Breitwisch, Dept. of Biology, University of Dayton, 300 College Park, Dayton, OH, 45469-2320, USA.

## ABS OFFICERS

**President**: Hugh Dingle, Dept. of Entomology, University of California, Davis, CA, 95616, USA. E-mail: rdhdingle@ucdavis.edu

**First President-elect**: Lee Drickamer, Dept. of Zoology, Southern Illinois University, Carbondale, IL, 62901, USA. E-mail: ga3687@siucvmb.siu.edu

**Second President elect**: Susan Riechert, Dept. of Zoology, University of Tennessee, Knoxville, TN, 37996-0810, USA. E-mail: pa34628@utkvm1.utk.edu

**Past President**: Zuleyma Tang-Martinez, Dept. of Biology, University of Missouri, St. Louis, MO, 63121, USA. E-mail: szthalp@umslvma

**Treasurer**: Randall Breitwisch, Dept. of Biology, University of Dayton, 300 College Park, Dayton OH, 45469, USA. E-mail: breitwis@udavxb.oca.udayton.edu

**Secretary**: Susan Foster, Dept. of Biological Sciences, University of Arkansas, Fayetteville, AR, 72701, USA. E-mail: sfoster@comp.uark.edu

**Program Officer**: John Byers, Dept. of Biological Sciences, University of Idaho, Moscow, ID, 83843, USA. E-mail: jbyers@idui1.csrw.uidaho.edu

**Parliamentarian**: George Waring, Dept. of Zoology, Southern Illinois University, Carbondale, IL, 62901, USA. E-mail: ga3609@siucvmb.siu.edu

**Editor**: Michael Beecher, Dept. of Psychology NI-25, University of Washington, Seattle, WA 98195, USA. E-mail: journal@u.washington.edu

**Members-at-Large:** Patricia Gowaty, Institute of Ecology, University of Georgia, Athens, GA, 30602, USA. E-mail: gowaty@zookeeper.zoo.uga.edu.

Christine Boake, Dept. of Zoology, University of Tennessee, Knoxville, TN, 37996-0810, USA. E-mail: boake@utkvx.utk.edu.

Katherine Wynne-Edwards, Dept of Biology, Queen's University, Kingston, Canada, K7L 3N6. E-mail wynneedw@qucdn.queensu.ca.

**Historian:** Donald Dewsbury, Dept. of Psychology, University of Florida, Gainesville, FL, 32611, USA. E-mail: dewsbury@webb.psych.ufl.edu.

**ABS Officers-elect:**

The following new officers will take office at the end of the 1995 annual meeting:

David Duvall, Second President-elect. Department of Life Sciences, Arizona State University West, P.O. Box 37100, Phoenix, AZ 85069, USA.

Kimberly Sullivan, Parliamentarian, Department of Biology, Utah State University, Logan, UT 84322-5305, USA.

Anne Clark, Program Officer, Department of Biological Sciences, State University of New York, Binghamton, NY 13901, USA.

Jean-Guy Godin, Member-at-Large, Department of Biology, Mount Allison University, Sackville, N.B. E0A 3C0, Canada.

**ABS TREASURER'S REPORT**

STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS  
1 JULY 1993 TO 30 JUNE 1993

**Beginning Balance:**

Nations Bank, Athens, GA	
Checking Account	-1,594
Money Market Account	40,499
University Employees Federal Credit Union, Athens, GA	
Certificate of Deposit	95,000
Savings Account	24,879
Southern Heritage Savings Bank, Athens, GA	
Ethnic Diversity Savings Account	3,351
Secretary's Fund	729
Certification Committee Fund	438
<b>Total Beginning Balance</b>	<b>163,302</b>

**Revenue Received:**

Membership Dues	
Regular	67,759
Student	19,784
Emeritus	840
Multiple (joint) Member	1,449
Fellow	2,058
Late Fees	2,641
Interest	6,073
Label List Sales	1,827
Professional Certification Fees	765
Graduate Programs in Behavior Booklet	358
Newsletter Only Subscriptions	668
Program Advertising	490
Contributions to Unrestricted Fund	904
Contributions to Research Award Fund	2,667
Contributions to Ethnic Diversity Fund	740
Miscellaneous Income	42

**Total Revenue Received** 109,065

**Total Funds Available** 272,367

**Expenditures**

Editor of <i>Animal Behaviour</i>	50,991
Secretary	14,186
Treasurer	9,965
President	918
Second President Elect (Allee Award)	395
First President Elect (Poster Award)	100
Parliamentarian	131
Member-at-Large (Research Grants)	7,250
Program Committee	7,426
Professional Certification Committee	935
Membership Committee	749
Education Committee	359
Film Committee	345
Public Affairs Committee	80
Animal Care Committee	1,125
AIBS Annual Affiliation Fee	780

**Total Expenditures** 95,735

**Ending Balance**

Nations Bank, Athens, GA	
Regular Checking Account	-7,930
Money Market Account	55,289
University Employees Federal Credit Union, Athens, GA	
Savings Account	125,059
Southern Heritage Bank, Athens, GA	
Ethnic Diversity Savings Account	4,195
Secretary's Fund	712
Professional Certification Committee Fund	33
Program Committee Fund	-726

**Total Ending Balance** 176,632

Approximately 3,565 in goods and services were donated by members and institutions during the fiscal year ending June 30, 1994. These items are not reflected in the accounting above.

**"What Meeting is This?":  
Meeting Sites of the Animal Behavior  
Society  
Donald A. Dewsbury, Department of  
Psychology,  
University of Florida  
ABS Historian**

We like to celebrate the anniversaries of important events when their numbers are multiples of our numbers of fingers and toes. Meetings of the Animal Behavior Society (ABS) are such events. The ABS historian is asked "which meeting is this?" Because of the complex history of the ABS, the answer is not simple. Rather, it is the reply of a professor!

For this and other reasons it may be of interest to summarize the evolution, number, and location of North American animal behavior meetings. In this brief article I extend the information provided by Guhl and Schein (1976) regarding the evolution of ABS meetings. The years, affiliations, and locations of meetings are presented in Table 1.

The origins of the Animal Behavior Society can be traced to a 1946 Conference on Genetics and Social Behavior held at the Roscoe B. Jackson Memorial Laboratory in Bar Harbor, Maine. At this meeting an ad hoc Committee for the Study of Animal Societies under Natural Conditions (CSASNC) was formed. The CSASNC began formal meetings in conjunction with the winter meetings of the American Association for the Advancement of Science (AAAS) in 1950. There were three such meetings (see Table 1). These meetings represent the first of the four phases in the evolution of animal behavior meetings.

A second phase of meetings developed with the formal affiliation of the CSASNC with the Ecological Society of America (ESA) and the American Society of Zoologists (ASZ). In 1952 a Committee on Animal Behavior and Sociobiology was formed under the auspices of the ESA and it took over the functions of the CSASNC. In 1956 the latter Committee became formally established as a Section of Animal Behavior and Sociobiology of the ESA. Guhl and Schein (1976) regard the 1956 Storrs meeting as the first regular meeting of the Section. In 1958 a Division of Animal Behavior was formed within the ASZ. The ASZ division and ESA section were designed to function as a single organization with one set of officers, meetings, etc. The second phase in the evolution of animal behavior meetings

included a total of 21 meetings of the Section/Division held in conjunction with the ASZ, which generally met in conjunction with the AAAS in December, and the ESA, which generally met in conjunction with the American Institute of Biological Sciences (AIBS) in the summer. As can be seen in Table 1, a pattern of two meetings per year thus evolved.

The Animal Behavior Society was founded at the 1964 AAAS/ASZ meeting in Montreal, Quebec, Canada. There were now three bodies, the ABS, ESA Section, and ASZ Division, all functioning as a single organization. Initially, the founding of the ABS as a separate organization had no effect on the pattern of meetings. The third phase of animal behavior meetings entailed joint meetings with the ASZ or ESA after the ABS was founded. The summer meetings with the ESA were terminated when the ABS began independent meetings and the tie with the ESA was eventually broken. However, joint meetings with the ASZ continued until 1987, when the Division of Animal Behavior within the ASZ became administratively distinct from the ABS. Many of these meetings were held after the ASZ began meeting separately from the AAAS, which moved its meetings away from the time block between Christmas and New Years preferred by the ASZ. A total of 27 meetings of the Animal Behavior Society were held during this phase of its history.

The first independent meeting of the Animal Behavior Society was held at Utah State University in Logan in 1971. There have been 23 independent meetings of the ABS, the fourth phase in the evolution of animal behavior meetings; the 24th independent meeting will be held in Lincoln, Nebraska this summer.

Guhl and Schein (1976) regard the summer meetings as "regular meetings" and the ASZ/AAAS meetings as "winter" meetings. By these calculations, the Storrs meeting was the first regular meeting and the Logan meeting, the first independent meeting, was the 16th regular meeting. By these calculations, the upcoming Lincoln meeting will be the 40th regular meeting.

In developing a summary of this sort, one needs to make judgment calls, perhaps even arbitrary decisions, regarding gray areas and what counts as a meeting to be classified within any category. A reasonable summary of North American animal behavior meetings would hold that there have been a total of 74 within this lineage. This does not include regional meetings of the ABS, the three North American meetings of the International Ethological Conference, or other specialty meetings. One might conclude that the ABS has held 50 meetings since its Montreal founding-- 27 in conjunction with other organizations and 23 independently.

Considering all 74 meetings, the most popular state has been Pennsylvania, which has hosted 7 meetings. Colorado has hosted 5 meetings with the District of Columbia, Illinois, Indiana, Massachusetts, New York, and Washington hosting 4 meetings each. Three have been held in Canada.

Of the 23 independent ABS meetings, 12 have been held east of the Mississippi River and 11 west of the river. There have been 3 each in North Carolina and Washington and 2 each in Colorado and Pennsylvania. The ABS met once in Canada. Only two campuses have hosted the ABS twice: the University of Washington in Seattle and the University of North Carolina at Wilmington.

So, "what meeting is this?" Take your pick: you can probably find some criterion that will produce a multiple of five for any meeting. My preference, if we are to celebrate, is to mark anniversaries of the history of the founding of ABS in 1964. The recent Seattle meeting, then, was the "30th" Anniversary Meeting of the ABS. However, we might also want to note that next year, 1996, will mark the 50th anniversary of the formation of the CSASNC, and that was what started it all.

#### Reference

Guhl, A. M., & Schein, M. W. (1976). *The Animal Behavior Society: Its early history and activities*. Animal Behavior Society. 66pp.

**Table 1. Meetings of the Animal Behavior Society and its Predecessors.**

Type of Meeting	Year/ City	Location State
Committee for the Study of Animal Societies Under Natural Conditions		
AAAS	1950 Cleveland	OH
AAAS	1951 Philadelphia	PA
AIBS	1952 Ithaca	NY
Affiliations with ASZ or ESA Prior to ABS Founding		
AIBS	1953 Madison	WI
AAAS	1953 Boston	MA
AIBS	1954 Gainesville	FL
AIBS	1955 E. Lansing	MI
AIBS	1956 Storrs	CT
AIBS	1957 Stanford	CA
AAAS	1957 Indianapolis	IN
AIBS	1958 Bloomington	IN
AAAS	1958 Washington	DC
AIBS	1959 University Park	PA
AAAS	1959 Chicago	IL
AIBS	1960 Stillwater	OK
AAAS	1960 New York	NY

AIBS	1961 Lafayette	IN
AAAS	1961 Denver	CO
AIBS	1962 Corvallis	OR
AAAS	1962 Philadelphia	PA
ICZ	1963 Washington	DC
AAAS	1963 Cleveland	OH
AIBS	1964 Boulder	CO
AAAS	1964 Montreal	QUE

#### Joint Meetings After the Founding of ABS

AIBS	1965 Champaign	IL
AAAS	1965 Berkeley	CA
AIBS	1966 College Park	MD
AAAS	1966 Washington	DC
AIBS	1967 College Station	TX
AAAS	1967 New York	NY
AIBS	1968 Columbus	OH
AAAS	1968 Dallas	TX
AIBS	1969 Burlington	VT
AAAS	1969 Boston	MA
AIBS	1970 Bloomington	IN
AAAS	1970 Chicago	IL
AAAS	1971 Philadelphia	PA
AAAS	1972 Washington	DC
AIBS	1973 Amherst	MA
ASZ	1973 Houston	TX
	1974 None (ASZ, Tucson, AZ)	
	1975 None (ASZ, Summer, Corvallis, OR)	
ASZ	1976 New Orleans	LA
ASZ	1977 Toronto	ONT
ASZ	1978 Richmond	VA
ASZ	1979 Tampa	FL
ASZ	1980 Seattle	WA
ASZ	1982 Louisville	KY
ASZ	1983 Philadelphia	PA
ASZ	1984 Denver	CO
ASZ	1985 Baltimore	MD
ASZ	1986 Nashville	TN
ASZ	1987 New Orleans	LA

#### Independent ABS Meetings

ABS	1971 Logan A. W. Stokes	UT
ABS	1972 Reno R. & B. Gardner	NV
ABS	1974 Champaign E. Banks & J. Hirsch	IL
ABS	1975 Wilmington J. T. Williams	NC
ABS	1976 Boulder M. Bekoff & D. Chiszar	CO
ABS	1977 University Park H. B. Graves	PA
ABS	1978 Seattle J. Lockard	WA

ABS	1979 New Orleans	LA
	T. E. Christenson	
ABS	1980 Fort Collins	CO
	P. N. Lehner	
ABS	1981 Knoxville	TN
	G. M. Burghardt	
ABS	1982 Duluth	MN
	H. Doane & K. Gindy	
ABS	1983 Lewisburg	PA
	D. K. Candland	
ABS	1984 Cheney	WA
	S. B. Christopher	
ABS	1985 Raleigh	NC
	G. Barthalmus	
ABS	1986 Tucson	AZ
	A. Kodrick-Brown	
ABS	1987 Williams	MA
	L.C.Drickamer	
ABS	1988 Missoula	MT
	D.A.Jenni	
ABS	1989 Highland Heights	KY
	T.C.Rambo	
ABS	1990 Binghamton	NY
	S. Wilcox	
ABS	1991 Wilmington	NC
	J. Williams	
ABS	1992 Kingston	ONT
	K. Wynne-Edwards & L. Ratcliffe	
ABS	1993 Davis	CA
	B. Hart	
ABS	1994 Seattle	WA
	J. Ha	

## PROFESSIONAL ETHICS

### 7. CONSCIOUSNESS AND ANIMAL WELFARE

by **Stuart Altmann**

**Chair, ABS Ethics Committee**

Item 10 in the Animal Behavior Society's Code of Ethics indicates that members of ABS shall carry out their work in accord with the Society's guidelines for the use of animals in research. Those guidelines are older and larger than all the rest of the Code of Ethics and occupy a separate section in the ABS policy handbook. Their current version is called "ABS/ASAB Guidelines for the Treatment of Animals in Behavioral Research and Teaching." The guidelines provide no general ethical principle upon which they are based except for this brief and somewhat vague statement: "...the investigator must always weight [weigh] the potential gain in knowledge against any adverse consequences for the animals and populations under study."

The study of animal cognition is currently a rapidly growing areas of animal behavior research. Much of this research involves the study of information processing: of the internal processes that act on sensory input, transforming, reducing, elaborating, storing, retrieving, and combining environmental information in the production of behavior. Many who are involved in such research make no assumption about whether nonhuman animals (hereafter 'animals') are consciously aware of these mental activities. Yoerg (1991) provides an excellent review of cognitive research from this perspective.

Another part of cognitive studies, and one that is particularly germane to the ethical basis of animal welfare policies, is the study of mental experience: of consciousness, awareness, intentions, imagery, feelings, desires, emotions, and related processes. The connection between animal welfare and animal cognition is straightforward: "The attribution of consciousness and intelligence to other animals suggests that they have moral rights" (Bekoff and Jamieson 1990).

In what follows, I shall, for brevity, focus on just two components of consciousness, emotions and intentions. Ristau (1991) and Griffin (1992) provide overviews of the field; references that I do not provide are in Griffin.

So, do we know whether any animals have conscious mental processes? To some, the answer is obvious: "The questions of whether minding is a legitimate field of biological study or why it has appeared in the living world are scarcely worth debating" (Mason 1986). Others are more circumspect in their evaluation. Suppose that you jab the foot of a dog with a sharp object. It will yelp and pull back--and then maybe turn and bite you. All that I have described so far is behavior. But surely, our conviction that we should not needlessly do this to a dog is based on our suspicion or conviction that what we have done to the dog is painful to it. And so, the question: do animals other than humans experience pain and other emotions? Indeed, do they have any sort of conscious mental activity? And, is the presence of such consciousness revealed by their behavior? If I built an artificial dog that yelped and pulled back when jabbed, and I then mutilated it, would I be guilty of a heinous act, or merely of damaging a toy? The problem of how one could answer such questions, or even whether in principle one can do so, is currently the topic of much discussion in biology, moral philosophy, and psychology.

Perhaps you think that there is no problem, that mental activities such as emotions, though not directly observable, are revealed by the animal's behavior. Mason (1986), after presenting an example of a description of behavior, writes that "a purist

might object to it as going well beyond an 'objective' description. After all, it could be claimed that such terms as 'attention', 'threatened', 'greeted affectionately', and even 'thirsty' are as much interpretive as they are descriptive. If we took this criticism seriously and tried to purge our account of all such objectionable language, we would ultimately find the task impossible...[because] our perceptions of behavior confound form, function and causation." He continues that attempts to clean up our language, to make our descriptive vocabulary more operational and precise are clearly important, but "it would be unwarranted to assume that they will eventually make it possible to describe behavior in the kind of language that is appropriate in physics, chemistry, or molecular biology."

Compare Mason's claim with the assertion that in principle, behavior "[is] describable purely in terms of physics and geometry. The behavior of, say, two sparring stags could be reduced without residue to a sequence of movements of masses (the parts of their bodies) through space over time. The basic units for describing such phenomena are familiar physical properties: distance, direction, time, speed, acceleration, force, angular momentum, and so forth" (Altmann 1981). In the study of language--surely one of the most complex forms of behavior--the reduction of utterances to sequences of phonemes and of those to articulatory movements of lips, tongue, velum, vocal cords, and so on has largely been accomplished (Jacobson, Fant and Halle 1963 and its successors).

Mason's position is neatly summarized in the title of his article: behavior implies cognition. But does it? Does an animal drink because it is thirsty, or do we say that it is thirsty because it drinks? Does it eat voraciously because it is hungry, or do we say that it is hungry because it has been deprived of food and now eats voraciously? Does the dog that is jabbed withdraw its leg because it is in pain, or do we say it is in pain because it yelps and withdraws? Are the terms for human emotions, when applied to other animals, just labels for certain constellations of conditions and behaviors, and have we reified those labels, making them into causes? Or do these constellations of conditions and behaviors reveal the emotions that underlie them? How can one decide? I for one do not know.

For expository purposes, I have made something of a straw man of Bill Mason's position, and I hope he will forgive me. What he has to say specifically about emotions in animals is more subtle: "...the weight of the empirical evidence...is overwhelmingly in support of the inference that something *functionally similar* to 'motives', 'feelings', and similar mental processes or events are very widely distributed in the animal kingdom and play an important causal role in behavior" (italics mine). That is, animals behave *as if* they have emotions and

those emotions are causal agents--which is exactly why we empathize with them and use anthropomorphic terms to describe their behavior. But how do we get beyond "as if"? We surely can study affective behavior, but how can we study emotions? How do we know whether we have just made our labels for affective states into causal agents? I am reminded of Julian Huxley's comment (1942) about Bergson's *élan vital* (vital spirit), which was supposed to be a much broader causal agent for life processes than any emotion. The *élan vital*, Huxley said, no more explains the workings of an organism than an *élan locomotif* would explain what makes a train run.

Many of the examples of behaviors that suggest conscious cognitive processes (e.g. in Griffin 1992) are those that appear to be intentional or purposive. A green-backed heron carries bits of material to a branch extending out over a pond and tosses the bait into the water. When minnows approach the bait, it flies down and seizes one (Higuchi 1986, 1987, 1988a, 1988b). A chimp that has found a panda nut walks to another tree where several days ago he cracked open a panga nut with a piece of granite. He carries the rock back to the nut he has just found and uses the rock to crack it open (Boesch and Boesch-Ackermann 1991). The natural history literature is full of descriptions of animals behaving *as if* they had goals, plans or intentions.

Unlike emotions, conceptual advances in the study of intentions have made important aspects of them amenable to study. The first is the work of early ethologists on "intention movements," particularly in birds (reviewed by Daanje 1951 and Tinbergen 1952). Intention movements are often very subtle movements that indicate to the ethologist and sometimes to the bird's companions what the bird will do next. A subtle elevation of the wings by a swimming duck may precede flight and serve to synchronize the departure of the entire flock.

The second advance was heralded by a startling article by Rosenblueth, Wiener and Bigelow (1943) in which they indicated how, by means of negative feedback, a system could show goal-directed behavior. In its simplest form, illustrated by a thermostat or a speed governor on a motor, the system has a single set-point and any deviation from that results in the system behaving in a way that moves it back toward the set-point. The similarity to the physiological concept of homeostasis was quickly recognized; the result was a revolution in the analysis of behavior and the physiological mechanisms behind it. Many activities of the autonomic nervous system are now known to be governed by negative feedback and are largely unconscious. Clearly, then, the presence of feedback loops are not sufficient criteria for consciousness. We need not assume that our furnace's thermostat is aware of what it does!

The thermostat in my house has only two ways to achieve its goal: it either turns my furnace on or off. The heron probably has many, and indeed, other members of the species have other ways of attracting fish. In both cases, however, the present behavior (controlling my furnace, carrying bait to the pond) makes sense only in terms of future consequences. That brings me to the third major conceptual advance in the study of purposive systems, one that resulted from studies of the structure of language. The crucial result can be paraphrased as follows. Our sentences contain embedded or hierarchical sequences such that the way in which we complete a sentence cannot be determined from the way in which it was started but only if one assumes that we have a plan for how we will structure the sentence. Various authors have tried to generate sentences by using left-to-right Markov processes. However, a consequence of embedded structures is that no finite state Markov process can produce all and just the set of grammatical sentences (Chomsky 1956, 1959). Instead, one must assume that the speaker has in mind a plan for the structure of the sentence he or she is about to utter.

Hierarchical structuring is found not only in language but in many other forms of behavior, "down to the temporal coordination of muscular contractions in such movements as reaching and grasping." (Lashley 1951). A carpenter does not look at the way in which, by chance, he has nailed together some two-by-fours and then decide to use that to make a wall. That way, the house would never be completed. Instead, he plans to build a wall (as part of a more general plan for a house) and on that basis, connects some two-by-fours in a particular way. Surely the same is true of a bird that builds a nest. Miller, Galanter & Pribram (1960) provide a stimulating discussion of the plans that must underlie hierarchically organized behavior. They even devote a chapter to "instinctive behavior." Yet curiously, their work is little known among students of animal behavior. As a result of these conceptual advances, the study of goal-directed behavior has been operationalized, or if you will, "demythicalised." We can objectively study intention movements, feedback loops, and plans for behavior. Fine-grained analysis of behavior--the cornerstone of much of ethology--can reveal the plans that underlie hierarchically organized behavior. Then we can begin to understand the circumstances under which animals adopt new plans. An animal that can, without testing, select a novel and adaptive behavioral strategy is not just processing information about its sensory world, it is internally evaluating internally generated and stored plans. Wouldn't that come closer to satisfying a criterion for conscious mental activity than evidence now at hand?

We cannot yet provide empirical criteria for deciding whether animals have conscious mental

activities, much less being able to study the characteristics of such activities. Yet, we should not wait for such criteria to become established and used before considering the issue of animal welfare. Until the issue of consciousness is clarified, perhaps we should opt for a variation on Pascal's Wager. The indifference of the religious skeptic about the existence of God, Pascal wrote, is to be answered by the following "wager": if God does not exist, the skeptic loses nothing by believing in him; but if He does exist, the skeptic gains eternal life by believing. If without adequate justification we treat animals as if they have no intelligence, feel no pain, are never hungry or thirsty--in short, as no more sentient than a toy dog--and if it turns out that we are wrong, then we have indeed committed heinous acts. In retrospect, perhaps the simple principle in the joint ABS/ASAB guidelines, quoted at the beginning of this essay, presents a judicious position.

**Acknowledgements:** I am grateful to Marc Bekoff and to members of the Allee Lab for helpful discussion of these issues.

**References:**--Altmann, S.A. 1981. Dominance relationships: the Cheshire cat's grin? *Behav. Brain Sci.* 4:430-431.--Chomsky, N. 1956. Three models for the description of language. *IREE Trans. Information Theory*, IT- 2: 113-124. 1959. On certain formal properties of grammars. *Information and Control*, 1959:137-167.--Griffin, D.R. 1992. *Animal Minds*. Univ. Chicago.--Huxley, J. 1948. *Darwinism today*. Reprinted in *Man in the Modern World*. Mentor Books.--Jakobson, R., C.G.M. Fant, M. Halle. 1963. *Preliminaries to Speech Analysis*. Cambridge, M.I.T.--Mason, W.A. 1986. Behavior implies cognition. *In Integrating Scientific Disciplines*, W. Bechtel, ed. Dordrecht, Martinus Nijhoff.--Miller, G.A., E. Galanter, K.H. Pribram. 1960. *Plans and the Structure of Behavior*. Holt, Rinehart & Winston.--Rosenblueth, A., N. Wiener, J. Bigelow. 1943. Behavior, purpose, and teleology. *Philos. Sci.* 10:18-24.--Tinbergen, N. 1952 "Derived" activities; their causation, biological significance, origin, and emancipation during evolution. *Quart. Rev. Biol.* 27:1-32.

*This is one in a series of columns devoted to issues of professional ethics that affect members of the Animal Behavior Society. Your comments and questions about these issues are welcome, and will be answered. Address them to Stuart Altmann, University of Chicago, 1507 E. 56 St., Chicago IL 60637; tel. 312-702-8919; fax 312-702-0988; e-mail alts@midway.uchicago.edu.*



## MEETINGS

**XXIV International Ethological Conference** will be held in Honolulu HI, August 10-17, 1995. The conference is open to all who are interested in ethology and allied fields and is sponsored by the University of Hawaii. There will be five days of plenary sessions, contributed oral, video, and poster papers and films interrupted by a free day for excursions. For information contact Ernst Reese or George S. Losey, Dept. of Zoology, University of Hawaii, 96822, USA. E-mail: IEC@zoogate.zoo.hawaii.edu. **Note: there may still be room on the program for late submissions.**

**18th Meeting of the American Society of Primatologists** will be hosted by the Primate Foundation of Arizona and Arizona State University. The meeting will be held June 21-24, 1995, at the Safari Resort in Scottsdale, Arizona, a suburb of Phoenix. Scientific sessions convene on Thursday morning, June 22, and continue through the afternoon of Saturday, June 24. Additional information is available from Jo Fritz, Primate Foundation of Arizona, PO Box 20027, Mesa, AZ. 85277-0027; Ph. (602)832-3780, fax (602)830-7039. e-mail 75031.3052@compuserve.com.

**Seventh International Conference on Human-Animal Interactions** will take place in Geneva Switzerland, from 6 to 9 September 1995, and will be hosted by IEMT-Switzerland and Afrac (France), on behalf of the International Association of Human-Animal Interaction Organizations. "Animals, health and the quality of life" will be a goal oriented conference focusing on the costs and benefits of companion animals to human mental and physical health, and their value in treatment of physical and mental health problems. The conference will be open to all who are interested. Contact Tristan Follin, AFIRAC, 7, rue du Pasteur Wagner, 75011 Paris, France. Tel: 33-1 49 29 12 00; Fax: 1 48 06 55 65.

**A symposium entitled, Finding Food: Neurothological Aspects of Foraging** is to be held October 6-8 1995 at the University Of Massachusetts, Amherst, in honor of Professor V.G. Dethier (1915-1993). Session chairs are: Alan Gelperin, John Hildebrand, Al Kamil and Mark Konishi. Speakers include: Dave Stephens, Lucy Jacobs, Bernie Roitberg, Janis Weeks, Gilles Laurent, Brian H. Smith, Masashi Kawasaki and Jim Simmons. For further information contact Gordon Wyse or Elizabeth Bowdan, Department of Biology, University of Massachusetts, Box 35810, Amherst, Mass. 01003-5810. e-mail: gwyse@bio.umass.edu or ebowdan@bio.umass.edu. Fax: (413)545-1696.

**1996 meeting of the Ecological and Evolutionary Ethology of Fishes** will be held at the University of New Mexico, Albuquerque, NM, May 25-30 1996. For information, contact Astrid Kodric-Brown, Department of Biology, University of New Mexico, Albuquerque, NM 87131. Ph. (505) 277-9336, Fax: (505)277-0304, e-mail Kodric@unm.edu.

**Third International Ethological Youth Meeting** will be held July 23-August 1, 1995. It will be held in Jakotpuszta, Nograd county, Hungary. The intent is to permit a forum in which professors can exchange ideas with young teachers, researchers, students, farmers, specialists and other interested people. There will also be visits to agricultural universities and research institutes, excursions to National Parks, and zoos to see endangered European and Hungarian species and tours to different types of farms. For information contact Dr. Tibor Keszthelyi, Ph: (06-28) 310-200; Fax: (06-28) 310-804; E-mail JKISS@RKT.GAU.HU.

**The Care and Use of Fish, Amphibians and Reptiles in Research.** This two day international conference will be held September 28-29, 1995, in Toronto, Canada and is sponsored by the Scientists Center for Animal Welfare (SCAW) and the Canadian Council on Animal Care (CCAC). For information contact: SCAW, 7833 Walker Dr., Suite 340, Greenbelt, MD 20770, Ph: (301) 345-3500, Fax: (301) 345-3503 or CCAC, 315-350 Albert, Ottawa, Ontario K1R 1B1, Canada, Ph: (613) 238-4031, Fax: (613) 238-2837, Email: CCAC@Carleton, CA.

## ANNOUNCEMENTS

**A Course on Ethical Issues of Animal Research** will be held on campus at Georgetown University, Washington D.C., from 6pm Saturday June 24, through 2pm Thursday, June 29, 1995. This is a multi-disciplinary course for those broadly interested in the profound questions of ethics and animal use. The course will present a well-balanced, wide range of moral perspectives on the ethical dilemmas of balancing human benefits against animal harms in scientific research, testing and education. Participants will include biological, biomedical, and social scientists, clinicians (veterinarians and physicians) and those with a background in humanities and philosophy. The course is funded in part by the Ethics and Values Program of NSF and is organized by the Kennedy Institute of Ethics. Contact: Moheba Hanif, Kennedey Institute of Ethics, Georgetown Univ., Washington, D.C., 20057. Ph (202)687-6833, Fax (202) 687-6770, E-mail HANIFM@GUVAX.GEORGETOWN.EDU.

**Call for papers, *Journal of Applied Animal Welfare Science*.**

This new journal will be published quarterly beginning January 1996. The goal of the journal is to publish articles and reports on methods of experimentation, husbandry, and care that enhance the welfare of animals. Formats include empirically based reports and invited or submitted articles and accompanying commentaries. Section Editors for the four content areas are:

David B. Morton, Lab Animals.

Joy A. Mench, Farm Animals

James A. Serpell, Companion Animals

Marc Bekoff, Wildlife and Zoo Animals

An inaugural issue of *JAAWS* will be published in the fall of 1995. In addition to empirical studies, it will provide critical literature reviews and make suggestions for needed research. Manuscripts should be received by May 1, 1995. For submission or subscription information please contact: Kenneth Shapiro, P.O. Box 1297, Washington Grove, MD 20880, e-mail kshapiro@capaccess.org or Stephen Zawistowski, ASPCA, 424 East 92nd St., New York, NY 10128, e-mail hvny03e@prodigy.com.

**Call for Proposals:** The Center for Field Research (CFR) invites proposals for 1996 field grants awarded by its affiliate Earthwatch. Earthwatch is an international non-profit organization dedicated to research and public education in the sciences and humanities. Earthwatch field grants average \$20,000. These funds are derived from the contributions of Earthwatch members who pay for the opportunity to join scientists in the field and assist with data collection and other research tasks. Earthwatch field grants cover the costs of maintaining volunteers and principal investigators in the field, and may help with other field expenses. Preliminary proposals should be submitted at least 13 months in advance of anticipated field dates. Full proposals are invited upon review of preliminary proposals. For information, contact Dee Robbins, Life Sciences Program Director, The Center for Field Research, 680 Mt. Auburn Street, Watertown, MA 02172. Ph. (617)926-8200, Fax: (617)926-8532. e-mail: drobbins@earthwatch.org, or Sean Doolan, Scientific Development Officer, Earthwatch Europe, Belsyre Court, 57 Woodstock Rd. Oxford, OX2 6HU. U.K. Ph. (0865) 311 600, Fax: (0865) 311 383, e-mail: Doolan@vax.oxford.ac.uk.

**Power Macintosh Real-Time Animal**

**Tracking.** A system composed of an Apple Power Macintosh (and AV model), a video camera, and software that tracks an animal on a heterogeneous background has now been validated using cockroaches, flea larvae, and small predaceous mites. Arena size may be up to 80 times the body length of the tracked specimen. The path is recorded as a series of Cartesian coordinates. The system produces real-

time readout of speed and rotation rate at up to 7.5 frames/sec. Run time is limited only by hard disk size. Files hold series of observations, each with 7 elements (frame number, elapsed time, X, Y, compass heading, speed, & turning readings). Replay gives mean speed and a graphic trace of the path. For more details see *Advanced Imaging*, Jan. 1994, pp 44-46 or contact James B. Hoy, USDA-ARS-MAVERL, P.O. Box 14565, Gainesville, FL 32604 Ph. (904)374-5991, Fax: (904)374-5818.

**Home Range Analysis for Macintosh**

**Computers:** Wildtrak is an integrated package of non-parametric home range analyses for use with radio-tracking and other locational data. Text format data files with up to 20 fields and 3000 fixes may be used. Analyses include Animation, autocorrelation, drift, dynamic interaction, grid cell analysis, movements, polygon analysis and static interaction. The package also includes a utility for conversion of bearing station data to coordinates. Results may be saved to text files or printed. Wildtrak 2 will have additional functions and features including habitat preference analysis and harmonic mean analysis. Contact: Dr. Ian Todd, 6, Sollershott House, Linkside Av., Oxford, OX2 8JA U.K. International Tel.: +44 1865 58358.

**Call for Information on Self-Medication in**

**Animals.** Many of the common ailments affecting domestic animals are not seen in the wild and are, therefore, either caused by captivity or are prevented in the wild by animals having access to their own pharmacy of wild plants, exercise etc. There is however, little evidence for or against this. I can find no reference to how sick animals behave in the wild. It seems strange that this knowledge is not required in order to treat animals in captivity. Fasting during sickness seems to be well documented both in the field and captivity, but, other than that, any mention of animals finding and feeding on particular herbs or minerals is anecdotal. I am collecting recorded incidents of sickness (and the behavioral response) in the natural habitat. I would like to know, for example, if the subject stopped feeding, changed diet, left the group, appeared to seek particular foods. Did it recover, and how long did it take? Contributions would be appropriately acknowledged in publications. If you have observations you would be willing to share please send them to Cindy Engel, Clover Forge Farm, Cratfield Road, Huntingfield, Suffolk, IP19 0QB, UK.

## OPPORTUNITIES

**Position Open:** Director, Karisoke Research Center, Parc National des Volcans, Rwanda, Africa. The Dian Fossey Gorilla Fund continues the study and conservation of mountain gorillas and their afro-montane habitat started by the late Dr. Dian Fossey in 1967 at the Karisoke Research Center in Rwanda, Africa. The Director coordinates all conservation and research activities based at the center and supervises a Rwandan staff of 31 employees. Ph.D. and fluent French required (Swahili helpful). Independent research possible. Contract for one year, renewable for a second year. For further information contact: Dr. H. Dieter Steklis, The Dian Fossey Gorilla Fund, Dept. of Anthropology, Rutgers University, P.O. Box 270, New Brunswick, NJ 08903-0270. Ph. (908) 932-7602, Fax: (908) 932-1564, email: Steklis@gandalf.rutgers.edu.

**Post-Doctoral Position,** Department of Neuroscience, University of Florida. Applicant should have a strong background in behavioral techniques and be interested in developing neurosurgical and neurophysiological skills. The successful applicant will join a laboratory which has an established long term commitment to research in spinal cord neurophysiology. We are seeking an individual with appropriate expertise that can expand ongoing behavioral techniques and develop new behavioral research objectives. The goal of the laboratory is to combine neurophysiology and behavioral techniques in the investigation of spinal cord injury and locomotor function in the rat. Contact: Dr. Floyd J. Thompson, Dept. of Neuroscience, Box 100244, Univ. of Florida, Gainesville, FL 32610-0244 USA. E-mail: THOMPSON@CORTEX.HEALTH.UFL.EDU, Ph. (904) 392-4088

**Volunteer Research Assistants** needed for a study of behavioral and physiological mechanisms of reproductive synchrony in female sable antelope at the National Zoological Park's Conservation and Research Center in Front Royal, VA. Duties include behavioral observations, collection of fecal samples, and laboratory analyses of steroid hormones. Prior experience conducting behavioral observations is helpful. A driver's license and ability to drive a manual transmission is required. Assistants are needed year-round. Preference will be given to those who can work at least three months. Assistants are provided dormitory housing. Send a letter of interest, resume, and two letters of recommendation to Dr. Kaci Thompson, Conservation and Research Center, 1500 Remount Road, Front Royal, VA 22630.

**Positions open:** The University of Southwestern Louisiana New Iberia Research Center invites applications for 2 tenure-track appointments at the assistant professor level in any area of comparative or developmental cognition. Applicants must possess an earned Ph.D. in an appropriate field and will be expected to establish grant-competitive research programs in areas of expertise. The Center houses 4700 primates (including a large chimpanzee population) available for research in comparative cognition and offers access to resources related to research start-up costs. Positions will be tenure-track appointments within the Division of Behavioral Biology at the Center with joint appointments in the Department of Psychology (or other appropriate academic department), where successful applicants will teach 2 graduate courses per year. Competitive salary dependent on qualifications. The positions will remain open until filled, but applications will be reviewed starting April 1, 1995. Send curriculum vitae and names of three references, and other supporting material to: Dr. Daniel J. Povinelli, Chair, Search Committee, Division of Behavioral Biology, USL-New Iberia Research Center, 4401 W. Admiral Doyle Drive, New Iberia, LA 70560. The University of Southwestern Louisiana is an Equal Opportunity/Affirmative Action employer.

**Volunteer Field Assistants** needed for a study of nest association between pumpkinseed sunfish and golden shiners in upstate New York, from mid-May to late July, 1995. Research will be conducted at the E. N. Huyck Preserve or at Cornell University, NY. Volunteers will assist in capturing and marking fish and collecting data on breeding success. Field experience helpful. Assistants must provide food and transportation to Albany, NY. Housing may be provided. Contact Binbin Shao, Dept. of Biological Science, State University of New York, Albany, NY. 12222. E-mail: bs7193@albnyvm1.edu.

### EDITOR'S NOTE

Opportunities are published in the issue of the Newsletter after receipt and occasionally in the next Newsletter on a space-available basis. Sometimes a position is filled between the time the Editor receives the advertisement and the time of the next issue of the Newsletter. The Editor apologizes for any inconvenience this may cause, and recommends that interested persons determine whether positions are still available before making formal application.

