

A S C A P

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"[W]hen Darwin lived ... the toolbox of authorship was far larger than that allowed scientists today. Building a variety of different discourses and using a variety of literary tactics was part of what was demanded and expected, by readers and writers both. Scientific writing simply partook of the larger literary field."

Scott L. Montgomery

Quoted in *Science* from Vignettes: Literary Marksmanship. *Science* 1996;272:218.

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Concerning paleobiology, sociophysiology, interpersonal and group relations, and psychopathology

**Across-Species Comparisons and
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ASCAP Society Mission Statement:

The ASCAP Society represents a group of people who view forms of psychopathology in the context of evolutionary biology and who wish to mobilize members and resources of various disciplines so as to enhance the further investigation and study of the conceptual and research questions involved.

This scientific society is concerned with the basic plans of behavior that have evolved over millions of years and that have resulted in psychopathologically related states. We are interested in the integration of various methods of study ranging from cellular processes to individuals in groups.

The ASCAP Newsletter Aims:

- ◆ A free exchange of letters, notes, articles, essays or ideas in brief format.
- ◆ Elaboration of others' ideas.
- ◆ Keeping up with productions, events, and other news.
- ◆ Proposals for new initiatives, joint

***The ASCAP Newsletter is a function
of the ASCAP Society.***

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World Psychiatric Association
<http://www.wpanet.org>

**Concerning the August, 1999 meeting
contact:**
www.wpa-hamburg.de

The World Psychiatric Association is an organization of psychiatric societies aimed at advancing psychiatric and mental health education, research, clinical care and public policy.

The basic members of the WPA are 110 national psychiatric societies, representing more than 140,000 psychiatrists worldwide.



***The ASCAP Newsletter is the
official newsletter of the
Psychotherapy Section of the
World Psychiatric Association.***

ADDRESSED TO & FROM ...

ASCAP Meeting in Hamburg August 6, 1999

by John S. Price

Sandra Schobel of CPO HANSER SERVICE has notified me that the ASCAP Society can have a room from the XI World Congress of Psychiatry for its meeting on April 6, 1999. We will meet at 9 am at CCH-8. This is the congress center (CCH = Congress Centrum Hamburg), room no. 8 on the first level. This is said to be easy to find. Please follow the signs. The room is already equipped for the scientific sessions which will take place there the next day.

As discussed before, this will be informal. Those present will discuss what is on their minds (like their latest projects and preoccupations). Ferdo Knobloch tells us that he plans to bring a colleague who worked with Karl Lorenz named Dr. Axel Schulze, a physician & psychotherapist from Baden-Baden. Detlev Ploog from the Max Planck Institute and the former associate of Paul D. MacLean plans attendance.

There will be a business meeting during which Mark Erickson will pass the gavel to Ivor Jones and the next Second Vice President will be designated.

The President's abstract, entitled, Human Kin-Recognition: an Integrated Paradigm is printed on page

MacLean Festschrift Report

By Russell Gardner, Jr.

The meeting at the Boston Backbay Hilton on July 16 and 17 was a splendid success. Co-organizer Gerald Cory and I were most pleased. All but one presenter showed (Hagop Akiskol unexpectedly didn't as he became ill but apologized by email immediately; he said indeed that receiving the final program almost made him leave the sickbed and come despite feeling bad, but prudence prevailed). Roger Masters sent Myron Coplan to read his paper.

Informative interesting presentations captured the audience's attention. One usually highly critical listener halfway through the last half-day said that "This is top level stuff." Any spare time was eagerly pre-empted by lively discussion. We ended with Karl Pribram's "last word" — he ended by imitating a dominant lizard (see next page for Suzie Gardner's photo using James Harris's camera; we're indebted to James not only for the photos — a number of cameras were active — but he had them quickly developed and then sent to us here in time for this issue).

A reporter from the journal *Science*, Constance Holden, attended all but the first and last meetings (curiously omitting our headliners who did superlative jobs, Drs. C.U.M. Smith and Karl Pribram). Though in

private conversations, she defended the original inaccurate review of MacLean's book in 1990 (likely the reviewer had not read it) by saying "It wasn't that bad." She did tell how a book review editor of the time had likely fostered the dismissive tone.

In any event, check your issues of *Science* to see if/when the meeting is featured in those pages. She had little good to say to the various participants with whom she conversed, but I personally found her congenial; she was most interested in Vassilis Koliatsos's new research findings on the retrosplenial cingulate cortex, an area that additionally caught her eye as it had been previously shown more active in women than men (an article by Gur and associates in *Science* about 1994; I saw the paper prior to our move but now it's buried in boxes so can't give exact reference).

Also National Public Radio sent a reporter who recorded the Master's paper presented by Coplan (at 4:15 pm, the first day slotted in the July issue for discussion). He interviewed Myron and others who know Roger's work and could appraise it. This work has possible public health implications as the kind of flouride added to municipal waters may be the kind that fosters lead deposition in bones (lesson: "eat calcium" as the water additive fosters lead to displace bone calcium but not if you have lots of

eaten calcium). Let us know if you heard this on NPR. We could not as we were on Cape Cod far from news.

Distinguished audience members included UC Berkeley neuroscientist and author Walter Freeman, psychologist and communications theorist Ross Buck from the University of Connecticut, Johns Hopkins University Vice Dean Carrie De Angelis, Harvard neuropathologist Marjorie LeMay, organization expert Madelaine Robbins from Boston, and Harvard university student Dorothy Weiss. We spanned the generations and hope to influence the future that Dr. MacLean's thinking is relevant still.

The group wished Dr. and Mrs. MacLean a most happy anniversary and some remarked that his enthusiasm for the islands in the St. Lawrence Seaway — where they are for this one — was already there in his earliest days at NIH. Though his physical presence wasn't in Boston, his presence was nevertheless felt through the conference via innumerable references to his inspiration, time spent with visitors and associates, his unflinching courtesy and his making younger colleagues feel that he considered them peers. Those who hadn't previously seen it, appreciated copies of his autobiography distributed to the presenters. His interest in the broader implications of brain science, the humanities, subjective being, and moral standards were perhaps influenced by being a minister's son.

Much appreciation was expressed to Pfizer drug company for their sponsoring the conference with a grant. David MacLean was lauded for his role in making the Festschrift a success.

The grant will, we estimate, cover expenses to the maximum extent of \$1000 for North American presenters and \$1500 for those coming across the Atlantic. As mentioned before there will be no honoraria. Each speaker should send me a UTMB prior approval form, original receipts for the expenses incurred, and a W9 form that was sent with the MacLean autobiography.

The AV machines worked and the hotel support staff were very active and helpful. Suzie Gardner monitored registration and support issues from the back of the room for which we were most grateful. Some glitches

occurred. I apologize here as I did at the meeting for somehow omitting Glenn Weisfeld's abstract in the July issue. He made a superior presentation and I and others found ourselves looking for it as he spoke in order to capture more strongly points that he made. Also I misspelled Horacio Fabrega's and Neil Greenberg's names. But generally things went well and the program evolved as Jerry Cory and I had planned.



Paul D. MacLean



Four remaining for the camera who worked directly with Paul D. MacLean: John Newman, James Harris, Neil Greenberg, & Karl Pribram



Karl Pribram imitating a dominant lizard

MacLean Festschrift Presenters



Speakers present on July 16, 1999: Back row standing left to right: Ernest Barrett, Glenn Weisfeld, John Newman, Anneliese Pontius, Alan Swann, Vassilis Koliatsos, Neil Greenberg, Dan Wilson, James Harris, Myron Coplan, Seymour Itzkoff, James Brody, Russell Gardner, Dan Matthews, Horacio Fabrega, Gerald Cory, John Price.

Front row sitting: Leon Sloman, Dan Levine, Karl Pribram, Christopher Smith.



Speakers present on July 17, 1999: Back row standing: Dan Levine, Vassilis Koliatsos, Ernest Barratt, John Newman, Dan Levine, Anneliese Pontius, Gerald Cory, Neil Greenberg, John Price, James Harris, Russell Gardner, Christopher Smith, Hdracio Fabrega, Dan Matthews Front row sitting or kneeling: Allen Mirsky, Glenn Weisfeld, Seymour Itzkoff, Kent Bailey, James Brody

Toxic history

I do sometimes wonder if "History" should not be handled, transported and buried with all the care that we (hopefully!) applied to toxic waste.

The events in Yugoslavia are the violent end of a spectrum of toxic history that extends into the United Kingdom where it is more a mild irritant in the process of evolving local government.

Toxic history is exemplified by the preoccupation of peoples such as the Serbs, Greeks and Russians with events in the 13-14 hundreds when the Mongolian and Turcic peoples had their turn at expansion in the "Imperialist" manner. There seems little to choose between Serbian whining about the great Kosovan defeat, Greeks celebrating the survival of their language and culture and bemoaning 400 years of "esklavia" and the Irish angst about the misdeeds of Cromwell. A huge and dare I say malign common denominator has always been the political "pot-stirring" of the Orthodox/Catholic church. The children of all these cultures have been brain-washed, steeped and pickled in a folklore of mawkish, maudlin and ultimately murderous story telling.

A great opportunity for the manufacture of fictional entertainment and folk industry puts the agenda in the hands of media money-makers. A core of vulnerable minds are unhinged by this exploitation of "history" just as they are by the literary profiteering of "feminists".

Resurrecting, re-inventing and recycling the history of Aboriginal collisions with invading cultures is more likely to lead to mind poisoning than a decent progression to the enjoyment of the present.

History should be contained safely away from us all and only visited by authorised historians suitably protected by the armour of good scholarship.

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Need for hard choices

I had a bird feeder here on the 4th floor until the neighbors complained about seed husks falling on their heads. I got a pair of cardinals and a lot of house finches, and also the famous Brooklyn parrots, descendants of escapees who are making a go of it. Vireos and northern mockingbirds turned up too. New York City is bird-rich. Last February, off of 79th and Fifth, I watched a pair of jays harassing a homed owl and then the guy with the best binoculars pointed out that what looked like a decorative urn on a doorman building was actually a redtail. Then there are the migrants; all our parks are important stopovers and refuges on the Atlantic flyway. If people don't think of cormorants and terns when they think of NY harbor, it isn't because they're not there.

I don't think location is as important as attitude. In a wealthy society it's possible to live in such

a way that you don't have to pay much attention, and most of your actions have no consequences. (Think of failing to show up at the office cubicle vs. failing to plant a crop.) But I think people yearn innately for authentic experience, and if they don't get it in their real lives, they compensate by making their entertainments more intense. It seems to me (and this is only an impression, I admit, not trying to theorize here) that movies have become more crudely violent because daily life lacks the elements of fear and hard choices. Maybe there's a dangerous spiral in this. As the TV and movies become more cunning at eliciting primal emotions, it gets harder to look away and take a walk outside in the sunshine, and that absence of contact with reality produces a yearning for still more impressive entertainments, and so on. Just a thought.

Anyway, I don't think cities are so bad for the soul. They keep you active and alert in their ceaseless change and unending variety. They also, as a practical matter, demand that you pay attention to what's around you.

The exhilaration of a long walk through 15 different urban neighborhoods is different than that of a long walk through a forest, but the skills you need to enjoy and survive the trip overlap. What's bad for the soul are the not-country, not-city places where experience has been artificially simplified and made unnaturally predictable and monotonous. There, where the environ-

merit gives people nothing to push against, is where the worst American lunacies have been bred. So, yes, I have a prejudice against suburbs, based on awful memories of living in one. But more for the state of mind than the geography.

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Craving lessened by protein

Yielding to my friends who criticized my gradual increase of weight, mostly belly, I cut back on carbohydrates. Quickly I experienced what millions of other people experienced-I was not craving food and my belly fat melted away. It was a dramatic change, like a biological switch being thrown. Could it be that we crave when on carbohydrate rich diet because *Homo Erectus* needed to keep digging up those tubers; tubers that were always there just for the digging but required consistent effort. When on a meat diet, the kills (or finds) would be much less consistent, waits long, and craving counter-productive.

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Dancing in air

I am not a therapist or a psychologist of any sort. In fact, I have spent much of my academic life somewhat at odds with psychology. I am the chairperson of Biology/Chemistry at Quinsigamond Community College in Worcester, MA. I have contended that modern psychology spent much of its time "dancing in the air"

without a firm footing in the biological sciences. Oh yes, there were the obligatory chapters in textbooks that talked about the "biology of the brain". And, some of my colleagues would occasionally want to borrow a brain or neuron model for "show and tell" in their introductory classes in psychology. But... they all "knew" that that was the extent of biology's influence on behavior and human nature.

My life-long attempts to enlighten both students and my social science colleagues can be seen as a mild "obsession". I developed and teach a course on the Biology of Sex, which takes a strong evolutionary position (Buss's *Evolution of Desire* is one of the texts). As a result, I am constantly making "different, but equal" arguments with colleagues. Another obsession? I attended a NSF Short Course on "Darwinian Medicine" at Stonybrook last summer and was fortunate enough to meet and listen to George Williams for a few hours. Finally, my interest in evolution led me to develop a one semester, introductory course in evolution. A unique feature of the course is that it is offered as a 4-credit course with a lab component. The lab component is unusual for an evolution course at the undergraduate level. It is accomplished with a melding of traditional labs (comparative anatomy, biochemical & biotechnical analysis, etc), computer simulations, and Internet sites.

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Clinical Sociobiology Course Albert Einstein College of Medicine Department of Psychiatry Cape Cod Seminars

by Russell Gardner, Jr.

As usual, James Brody exerted heroic efforts to bring together faculty members to the third version of this course, subtitled, "Healing the Moral Animal: Lessons from Evolution and Complexity." The other faculty were John Fentress, John Price, Suzie Gardner and myself. The course members were nearly all clinicians with a few who were academic or seriously interested and well read though not formally educated in these matters. A mix of psychiatrists, psychologists, social workers, counsellors of other persuasions, academics, practitioners, soon- to-be authors and avid readers, made for a lively discussion and I sensed that we will have an enriched discussion in the pages of *The ASCAP Newsletter* as a result, e.g., see the letter from Bob Prior that just precedes this.

The clinicians had a range of practices from family work to social work to psychiatrist to clinical psychologist. One psychiatrist was a bibliophile who brought along books that he didnt need further and several of us found ourselves digging into our pockets for classics or previously unread but heard of tomes. A number of people work at Albert Einstein College of Medicine or its affiliates and we traded stories from when I had been there 25 years ago. Suzie talked on twins (she is one) and referred to Nancy Segal's book,

Entwined Lives, as Suzie juxtaposed her own experience with that of the accumulated research literature.

But the chief focus fostered by our leader, Jim Brody, hinged on clinical applications of knowing something of evolutionary theory. Jim has produced a volume of course material. His extraordinary knowledge continues to amaze us all: he constantly scans the literature, stays current on the internet, appropriates models with clinical applicability, and challenges us to keep up. We hope that the book becomes published as it deserves a place as a welcome text on *Clinical Sociobiology*.

My tack, with which Jim is tolerant, hinges on the importance of what I refer to as clinical sociophysiology, a domain that encompasses all the clinical human sciences but which attends to the nitty gritty proximate mechanisms too, as at brain and molecular levels. I have tried over the years to evolve meaningful acronyms that students can use directly.

Recent email from a colleague still in Galveston brought home that it might be useful. She knows a former patient of mine, who said to her, "Now what is ATP again?" The former patient referred to the clinically useful parts of the advantages to having a three-times larger brain than our nearest primate relatives. My colleague could remember "Allies" but recalled that when she had first heard it, the latter two (Thought and Planning) seemed more intuitive. Curiously

now she could remember the first originally novel one but not them. I felt good that some minds are being teased and maybe even helped by deliberate application of these ideas that stem from realizations that we are evolved animals.

John Price's work also carefully attended to work with patients. He presented his version of the triune model with six cells that stemmed from the two columns of escalation and de-escalation of conflict intersecting with the three brain levels of rational or neocortical level, emotional or limbic level, and instinctive or r-complex level (previously seen these pages). The class members brought clinical cases for exploring how actual people fit the model; it applied to them in clarifying ways, at least to me. I was impressed the caliber of the clinical work and the openness with which cases and experiences were discussed.

Suzie and I had to leave before hearing John Fentress's work in formal context. He is a Robert Hinde trained ethologist who has worked extensively with wolves. His inquiring mind left no stone unturned in formal and informal discourses (much pleasure in such groupings stems from the informal learning one experiences). He is also working on human infant development project. Like Jim Brady, he is also active in the internet from his haunts in Dalhousie and Oregon.



Recommended New Books

Weisfeld, Glenn: *Evolutionary Principles of Human Adolescence*. New York, NY: Basic Books, 1999.

Segal Nancy: *Entwined Lives: Twins and What They Tell Us about Human Behavior*. New York, NY: Dutton, 1999.

Cooke, Brett, Turner, Frederick (Eds): *Biopoetics: Evolutionary Explorations in the Arts*. Lexington, Kentucky, USA: International Conference on the Unity in the Sciences, 1999

Bedaux, Jan Baptist, Cooke, Brett (Eds): *Sociobiology and The Arts*. Amsterdam/Atlanta, GA: Editons Rodopi B.V., 1999.

Kagan J: *Three Seductive Ideas*. Cambridge, MA: Harvard U Press, 1998.

Buss, David M.: *Evolutionary Psychology: The New Science of the Mind*. Allyn & Bacon, 1999.

Gehring, Walter J.: *Master Control Genes in Development and Evolution: The Homeobox Story*. New Haven, CT: Yale U Press, 1998

Rosen David H., Leubbert, Michael C. (Eds): *Evolution of the Psyche*. Praeger Publishers, 1999.

Weiner, Jonathan: *Time, Love, Memory: A Great Biologist and His Quest for the Origins of Behavior*. New York, NY: Alfred Knopf, 1999.



*Grandmothers, Gene Wars, and Later Day Saints: Darwin Goes To Salt Lake City for HBES 99***Sex conflict exists**

John Beahrs remarked at the end of this year's HBES conference that the strongest impression from the presentations was the intense male/female conflict that continues to dominate human life, from the molecular level through the individual to the social. Gene warfare at the locus that determines reproductive anatomy, human mate poaching, evolved psychological mechanisms to guide sperm competition, and the advantages to females of polyandry were just some of the topics to make that impression.

Fertility declines

Monique Borgerhoff-Mulder began the conference with a plenary address on the demographic transition. Since the nineteenth century there has been a shift in human reproduction known as the demographic transition, which confronts evolutionary approaches to human behavior. People choose to limit their reproduction voluntarily when resources are plentiful. Fertility declined in Western countries by the end of the nineteenth century. There had already been a decrease in infant mortality before the decrease in marital fertility. This fall-off in fertility occurs during transitions to wealthier economies and is initiated by the wealthiest sector of the population. Why is low fertility connected with economic success? She addressed whether

1 This was a maladapted by-product of rapid environmental change without any adaptive value, 2. This was a consequence of a Darwinian, but non-genetic, mechanism of transmission, whereby traits spread irrespective of their fitness effects on individuals, and 3. Marital fertility drops because there is an optimal level of births in a competitive environment in which these few offspring are raised. Do parents maximize

fitness by trading off quantity of offspring for quality of offspring, the optimal clutch size model. She laid out why there is no empirical evidence to support any of these models. Why would any intermediate levels of fertility be optimal? Is this representative of any communities that reflect our evolutionary past? The evidence suggests no. Is there an optimal level where heritable wealth is critical to offspring fitness? There was no evidence. A slight variation of the prior question asks, Would an intermediate level be optimal where heritable wealth bears particular relation to earned wealth? There was no evidence.

Her otherwise excellent talk was marred by vagueness at the end. She concluded by saying that there was no clear evidence that intermediate levels of fertility are optimal within the range of fertility which is observed. Using some evidence from horticulturist communities in Africa that are in transition, she suggested that there were intriguing indicators that material decisions are actually involved in reproductive decisions. This material optimization strategy might be in all humans and appear robustly as a general human feature when there is massive increase in wealth. In a discussion with her afterwards, she used the analogy of an evolved taste for fat, which becomes more apparent and maladaptive in a modern environment. There are material considerations in reproductive decisions that only become apparent with great wealth.

Paternity confidence

Thursday morning's paper sessions included sections on: differential parental investment; cognitive specializations; a symposium examining the validity of waist to hip ratios and human female attractiveness; and the first part of a symposium on bio-poetics. Kerymt Anderson, an anthropologist, presented evidence

presented on paternity confidence and fitness outcomes related to modern abortion, divorce, and parental investment. Paternity confidence has two variables. It reflects the probability of a particular male as the father, which is the percentage of a brood that was fathered by that particular man. The second aspect is assessment of paternity. Paternity confidence is crucial to paternal care of offspring before and after divorce. More men are more likely to divorce after the birth of low paternity confidence infants. Divorced fathers invest less in low paternity confidence children, and women are more likely to abort if there is low paternity confidence.

One of his findings was that the factors which influence a man's assessment of paternity confidence. Low paternity confidence is associated with young males of low income and education. When men assess paternity confidence, they do not take their own self assessment as a factor, but focus it on factors associated with the woman: whether they are married to her, whether the pregnancy was planned, if the woman is of higher educational standing, and if they already have children together.

Biopoetics including narrative and baby talk

Dev Singh's work was the center of the waist to hip ratio symposium. He presented material from art and literature that has to do with men's view of waists, e.g., "The tender garters of thy waist," Lines to Fanny, John Keats. The first paper of the biopoetics symposium would be near and dear to Russ Gardner's heart.

S. M. Scalise presented a paper, "Narrative as virtual Reality." The thesis is that firsthand knowledge acquisition can be dangerous and costly and that selection would have favored a system by means of which information could be acquired second hand. Language is the most obvious means for this task. Of the forms of language, one of the specialized mechanisms is narrative. Narrative allows a system that simulates firsthand experience and permits learning by indirect experience. It constructs integrated representations of the human physical, social, and mental environment and this narrative faculty serves as a virtual reality. Scalise argued that selection would

have favored the integration of the language faculty with numerous cognitive structures to process and retain first-hand experience (theory of mind, causal reasoning, temporal perception, and location memory) as narrative. This exploits the benefits of first-hand experience while removing the costs.

Ellen Dissanayake presented with David Miall superb talks on the "macro-poetics and micro-poetics" of baby talk. Utilizing video tapes of mother-infant interactions and transcripts of the vocalizations, they analyzed the overall structures and the small scale structures. They make a case that baby talk is an evolved mechanism that facilitates the regulation of affect and perception. Mother and child engage in direct interactions with language facilitating the attachment bond. They demonstrated how the creative arts are culturally created extensions and elaboration of these innate, affective signals, which engender and sustain attachment, emotion, and accord between individuals as they did with the "babytalk" precursor between mother and infant.

Red Queen within the genome

Thursday's outstanding afternoon plenary featured William Rice of the University of Santa Barbara who presented on adaptation and co-evolution of the sexes: gender-specific fitness, interocus contest evolution (ICE), and sexually antagonistic genes. Rice's presentation was a favorite for many. We tend to think of red queen effects as contests between species: predator/prey, plant/herbivore, and host/parasite. He described a form of inter- and intra-genomic conflict that centers on the genes responsible for the anatomy, physiology, and functioning of reproductive systems. He presented evidence that this interocus conflict sets up an atypical red queen antagonistic co-evolution between alleles at different loci which code for phenotypic differences in genitals. This genetic conflict mediates the contest between the sexes in the battle ground of sexual reproduction.

Seminal fluid proteins from male flies affect the neuroendocrine system of the female. It reduces her sex drive, reduces her re-mating behavior, and increases the number of eggs she produces, and

assists him in sperm competition. The seminal fluid proteins are good for the male, but harmful for the female. The first male to copulate with the female has a "defensive" system with regards to the second male who copulates with the female. The subsequent male who copulates has seminal proteins with other mechanisms to displace the sperm of the first male. He refers to this as the "offensive" system. Any species with internal fertilization has direct chemical communication between gene products of the two sexes. This sets up a contest between the genes controlling the design of the reproductive tract. This war will lead to accelerated divergence of reproductive tracts, decreased compatibility of male and female reproductive tracts, and ultimately leads to sterile hybrids before inviable hybrids. It also leads to reproductive isolation of a group and contributes to the development of new species.

He showed how there would then be a three-way conflict, an intergenomic conflict, between the males for offensive versus defensive reproductive components of their reproductive tract, and then conflict between male and female at the level of reproductive organs and behavior. Wise believes similar conflict is part of mammalian species, humans not excepted, but the work has yet to be done.

Music, father presence, the best contraceptive

On Thursday afternoon, early paper sessions included sections on birth order; pregnancy, prenatal effects, and fertility; a symposium on Darwinian ecology, and the second part of the biopoetics symposium.

John Manning of the University of Liverpool presented data on second and fourth digit ratios in autistic children and elite musicians. This, to be published in *Human Behavior and Evolution*, supports the conclusion that pre-natal testosterone exposure may be related to musical ability and that musical ability may be an honest advertisement of male fertility.

K. Norberg from the National Bureau of Economic Research, presented data that the involvement of fathers at the time of conception and pregnancy influences the sex ratio at birth. Mothers who were

living with a male partner at the time of a child's conception had 52.4% boys compared to mothers who were not living with a male partner at conception who had 51.4% girls.

Dustin Penn of the University of Utah returned to the issue of the demographic transition in his presentation. Economic development is clearly the best contraception. Diffusion of modern contraception devices and pills cannot explain fertility decline. He thinks there must be multiple reasons. The fashionable reason is women's empowerment. The idea that with increased education there is a delay in marriage and delay in first reproduction. With increased economic welfare there is increased female self-reliance. The question is why empowered women demonstrate a fertility decline. Hypotheses include that women prefer fewer children, and men coerce women for more children. In educated women it has been found that the stated preference for desired number of children is equal to the actual fertility. One question he addressed is why men are rarely sterilized since vasectomy is cheaper. Increased rates of male vasectomy occur only when the woman is educated and of higher status. Penn hypothesized that the ultimate reason for the fertility decline is that women bear the cost more than men. It is unclear why men would coerce their wives for more children than the economic optimum. This might be related to paternity uncertainty. The women empowerment hypothesis is the fashionable reason now given for the demographic transition. But Penn believes we may be seeing a reverse naturalistic fallacy: it seems true because it ought to be true.

Sperm compete

Thursday afternoon's sessions were on: social reasoning; esthetics of human form; the second part of Darwinian ecology; and a symposium on the psychology and physiology of human sperm competition.

Todd Shackelford of Florida Atlantic organized the symposium on human sperm competition. His group from Florida Atlantic both at this symposium and in other sections, presented a wide range of work which attempts to map out the psychological mechanisms suggested by Baker and Bellis's work on sperm

competition. What predicts female coital orgasm? Is the only predictor the male partner's perceived physical attractiveness? There were several presentations and a poster that both supported and challenged this thesis.

Nicholas Pound from McMaster University participated in the symposium on sperm competition. Many may remember him from the conference in Davis, California, where he presented evidence that males were more aroused when watching pornography when there was suggestion of sperm competition. In Utah he reported an empirical study that examined male ejaculates. He discovered that there were more sperm and more mobile sperm when men thought there was sperm competition. This is further evidence that men can unconsciously physiologically alter the ejaculate composition by visual stimuli.

Shackelford presented "Absence Makes the Heart Grow Fonder...but Only for Men." He hypothesizes that male psychology is going to include mechanisms to gauge the risk of sperm competition. Because women don't have the risk of their partner being inseminated, they will not have these mechanisms. After even brief separation from their female partner, men rate their female partner more attractive, men rate their female partner more attractive to other men, and the men have increased interest in copulation with her. He noted that domestic battering is increased proportional to the perception of sperm competition.

ASCAPers present posters

Thursday evening was the poster session. Ed Hagen, who many of you remember from the ASCAP meeting in Tucson, who won the 1997 Beck Award for his work on paranoia, won the HBES 99 best poster competition.

His poster reported on his group's investigation of the effect of parental investment on child health in a Yanomamo village. Don LeCroy had a poster of her case which was published in a prior ASCAP newsletter. Linda Mealey had a poster on anorexia nervosa which offered a theory based on the biologists Wasser and Barash's "reproduction suppression model." She

proposes that the modern epidemic of anorexia is explained neither by adapted self suppression nor by environmental mismatch. She proposes that the epidemic levels in modern Western society are direct consequences of intrasexual competition, the scope of which has been enhanced by modern media. Her ideas will be published in a forthcoming article in *Human Nature*. ASCAPers Lynn O'Connor and Jack Berry were part of a superb poster on personality, subjective well being, and psychopathology in chimpanzees.

Birds and their mating

Friday morning's plenary address was "Mate Choice and Genetic Variation" by Marion Petrie of the University of Newcastle, England. HBES 99, like the HBES 98 in Davis, had a plenary address by a superb ornithologist. She noted that birds show the full range of mating systems. Like humans, they are socially monogamous species with high variation in extra pair paternity. There is even wide variance in extra pair paternity within single species inside the bird kingdom. Females control the success of copulation. The proportion of broods with extra pair copulations (EPCs) will be high when it pays. The variation in frequency of EPCs will vary with the benefits to females, the variation in costs to females, and with variation in constraints on female choice. The proportion of females seeking EPCs will be dependent on the variation of male genetic quality.

Petrie had detailed data to show that the mutation-selection balance predicts higher mutation rates in sexually selected species. The females seek EPCs to decrease the cost of mate loss; she can more quickly re-pair in event of mate loss. A female may obtain direct benefits by increased foraging in the territory of the EPC male, additional defense, and improved fertility. The costs are decreased partner investment and the search and assessment cost for new males. The constraints on the female varies with the behavior of the male partner- his mate guarding and repetitive copulation and the behavior of other females. It is not cost neutral to the female for her male partner to mate with another female. There is the risk of disease, the risk of sperm depletion, and loss of male

investment. There is also a variation in the level of female mate guarding. Usually, it always pays for males to seek EPCs, but the unappreciated costs can include sperm depletion, disease, divorce, lower parental investment, and increased risk of cuckoldry (they cannot guard their mates).

Female emotionality an evolved strategy?

Friday morning paper sessions included sections on: metatheory, philosophy of science and ethics; fertility, demography and culture; mating tactics; emotion and motivation; and a special panel discussion on risk taking. In the section on emotion and motivation Dori LeCroy presented her theory of female emotionality, which previously appeared in the ASCAP newsletter. Men display anger as a way of dampening escalation of personal distress and hyper-arousal that can lead to violence. But human female's distress displays mimic juveniles, and may represent a co-evolution between neotenous stimuli and high male parent investment. Mimicry of juveniles may have sufficiently averted aggression and increased transfers of resources from males to females to support specific selection. She contends that contrary to most of our early theories, emotional displays by women may not reflect regression or immaturity, but are the expression of a situation-dependent evolved strategy.

Adolescent boys and girls

Friday afternoon's plenary address by J. R. Urdy focused on romantic relationships in adolescents. Urdy defines gender as the relationship between sex and behavior. There are differences in what he calls gender behavior and he sees it as sex dimorphic behavior. He defines masculine as what most males do and feminine as what women do. Urdy utilized a scale to measure gender behavior which is called PRBOY (probability of boy). This measured the probability of masculine behavior. Adolescent males who were very masculine had high PRBOYs score and very feminine adolescent females showed low PRBOYs score. His research explored the formation of romantic heterosexual relationships in adolescents and the role of gender composition in the formation,

content, and duration of those relationships. His data suggested that gender is a predictor of who nominates whom, whether the romantic choice is reciprocated, whether the couple has sex, how long it takes the couple to begin sexual relationships, and how long the relationships survive. Couples in the middle range of gender behavior for their respective sexes have a low probability of reciprocating romantic choices, take a long time initiating sex, and their romantic relationships do not last long. Couples which had a male with high masculinity scores and a female with high femininity scales were the most likely to have sex.

Female gossip

The early Friday afternoon paper sessions included: psychology of risk and reciprocity; coalitions and conflicts; part one of a symposium on alternative approaches to evolution of cooperation; and part one of a symposium on scents and sensibilities: chemical signals and mate choice. In the coalitions and conflicts section Nicole Hess, an anthropology graduate student from Santa Barbara, presented an excellent paper, "Female coalitions and gossip." She described what she terms the "information warfare involving gossip and friendships and reciprocity." She showed that deception may not be involved in this information warfare. As long as information is translated through many coalition members, it more likely seems true.

Her work is based on the idea that female exogamy was a recurrent feature of the EEA. Women entered a group in which they had to compete with others for the resources of husbands. Female exogamy also presented an adaptive problem to women already established in their groups because of a new, nubile female who would likely attract the attention of the male group members. Ms Hess proposes that female coalitions function to help new female group members and established female group members compete on an individual level for access to male investment. One form of this competition may have been gossip. She predicted that the main goal of female coalitions was the ability to extract more resources from male group members. Her hypothesis was supported by research on female friendships.

Why do ethnicities equal species?

The first prize paper was presented Friday afternoon. Francisco Gil-White, from the department of anthropology at UCLA, presented "The Ugly Duckling-A Story About Ducks and Swans, or Metaphor of Ethnicity: Why Ethnicities Are "Species" To the Human Brain." He presented research he conducted in Mongolia that supports a hypothesis that other ethnicities are processed naively by cognitive "living kind" modules as other non-human species.

The symmetry pheromone

Many may be familiar with the work of Randy Thomhill on females' preference for the smell of symmetrical males at the time of greatest conception risk in their menstrual cycles. Monti-Bloch of the University of Utah presented evidence that androstadienone, an androstene, occurring in male human skin secretion, stimulates chemo-sensory receptors in the female human vomeronasal organ, reduced negative affect and increased relaxation. Androstadienone also reduced respiratory frequency, pulse and skin conductance, and increased para-sympathetic tone, body temperature, and alpha brain waves. Is androstadienone the sought-after scent of symmetry?

Subjective commitment

The late Friday afternoon papers session included sections on: kinship; evolution of religion and morality; the second part of the symposium on alternate approaches to evolution of cooperation; and a continuation of the symposium on scents and sensibilities. During the second part of the symposium on the evolution of cooperation, Randy Nesse presented his new work on the capacity for subjective commitment. Is it an adaptation? Can it help to explain altruism and social complexity? Nesse noted that commitment is present in friendship, love, basic trust, and group loyalties. Commitment works because of reputation, general laws, contract laws, and religion. He stressed repeatedly that it is a deep paradox because people are committing to things that are clearly not in their self interest. And, how would this have evolved, particularly when commitment can open one to exploitation? Nesse believes that this

inherent paradox in commitment strategies gives rise to many of the "inordinate and wonderful social complexities" of human nature.

Polyandry works

Friday evening was the banquet with Sarah Hrdy as the keynote speaker. If her forthcoming book *Mother Nature* contains many of the ideas expressed at the banquet, it will certainly be worth reading. The title of her talk was "If Evolutionary Theory Is So Powerful, Why Do We Still Need History?" Professor Hrdy challenged the stereotypical notion of men being ardent while women are reluctant. The emphasis of her talk was the central place of female mate choice in sexual selection and the unappreciated benefits of polyandry. She focused her talk on the benefits of polyandry, the traits facilitating polyandry, the ethnographic evidence, and the local history of constraints on females. She believed that good genes were not the only incentive for female EPCs. Gifts, resources, and social support were other benefits. There would be short and long term advantages: tolerance, support and comfort, and protection from men. Females of many species are clearly protected from infanticide by mating with other males and males from other groups. A female whose offspring is killed by an incoming male instantly suffers the cancellation of previous mate choice. She must face the immediate forced copulation with a male not necessarily of good genetic quality and not of her choice. Primate males who have copulated with other females will defend those females against males with whom the females have not mated.

The usual evolutionary story is that female genital swellings were present in all early non-human primates and *Homo sapiens* is unusual. She argues that sexual swellings evolved to facilitate mating with multiple males in chimpanzees and bonobos and may not have been present in our common ancestor. They are not found in most of the other twenty-five current primate species. Sexual swellings, she believes, evolved only three times. She noted that there is a mid-cycle peak of libido in all primates, but that females can solicit males with situation dependent cues. She thinks that females manipulate the infor-

mation available to males about paternity, drawing them, multiple males, into the web of paternity, uncertainty. This is especially true when male care is neither certain nor exclusive. She noted that one third of human cultures have culturally sanctioned female EPCs in some form. This may be either female shared with kin or sequential marriages. She noted that the notion that patriarchy is paramount should be questioned; matrilineal societies exist when the context permits. Where there's a high adult mortality and where protection of females and children is inadequate matrilineal organization occurs. Professor Hrdy pointed out that in several primitive South American Societies, which were widely dispersed, there were beliefs that the fetus was built up by semen from multiple fathers. In these societies if there were too many fathers, the woman was deemed as promiscuous. When she became a mother then there was diminished provision of her children. In these societies often the women, when they become pregnant, will then seduce a high status male as a second father.

One of Hrdy's conclusions echoed Wise's presentation about genetic conflict over genitals. Short of parthenogenesis, monogamy is the best protection against the toxic effects of natural selection. When women could do something to aid protection, hedge their bets, they would line up several fathers. With the development of patriarchal societies, there was decreased EPCs by well-off women. She noted that as far as female selection goes, there were reasons to be coy, faithful, and discreet. One of her final questions asked, when did patriarchy out-do matrilineal societies? When is it that female philopatry pays? Does low certainty of paternity lead to matrilineal heritage or does matrilineal heritage with greater female autonomy lead to low certainty of paternity?

Murder and hate

Saturday morning's plenary address, "Female Aggression: Fear, Form, and Frequency" by Ann Campbell of Durham University in England was cancelled due to her illness. The Saturday morning papers sessions included sections on: aggression and homicide;

developmental evolutionary psychology; a symposium on ontogeny of human reproductive strategies; and part one of a symposium: the food of love, the love of food: new directions in the study of food and fitness.

David Buss and his graduate student Joshua Duntley presented further research on what they believe to be evidence of evolved homicide modules. They pointed out that there would certainly be recurrent selection pressure when the benefit would be greater than cost for dead bodies to be the designed output of a module. They believed that there were many distinct situations in the EEA where a benefit of murder was greater than cost. They think there are specific functions to a homicide module and there are many of them. Buss pointed out that man is a "feeler, assessor, planner, and calculator." The mind is adapted to deal with and cognitive space is utilized for things that are rare, complex, and important to the future. If the function of the mind is to cause behavior, the presence of homicidal ideation may suggest homicide modules. Since every thought of lust doesn't lead to intercourse, and we would certainly say there are sexual behavior modules, ideation around the issue of homicide may suggest modules for murder. Homicide ideation is useful for scenario building and cost assessment. Their research asks the question, does homicidal pre-meditation conform to adaptation?

Owen Jones, professor of law from Arizona State, noted that law is fundamentally about the regulation of human behavior, yet the legal system lacks any sound theoretical foundation for why humans behave as they do. This is especially true in the areas of emotions, norms, and economic behavior. He used the issue of rape to illustrate how bio-behavioral understanding of rape can better inform the law, anti-rape initiatives, dealing with rape trauma, and injecting humility into the pronouncements on rape. Richard Wiebe followed with a superb presentation on a Darwinian theory of hate crimes. He reviewed the general theories of criminality and war and suggested that hate crimes are like the psychology of war. They occur when there is a threat to reproductive relevant interests: resources, sex, and status. A person with average mate value that may be less than the mean of the group, "the bass player syndrome," will identify the groups

interest as their own, will experience a threat to the groups interest as a threat to themselves, and will perpetrate a hate crime.

Anorexia and homosexuality

There were two paper sessions on Saturday afternoon. The first section included sessions on: modeling human cooperation and coalition; male attractiveness, anthropometries, and mating; jealousy, and the second part of the symposium on the food for love. Late Saturday afternoon the paper sessions included: experimental economics; language, intentionally, and cognition; parents and children; and a symposium: contrasting evolutionary hypotheses of human male homosexuality. Shan Guisinger presented a view that aspects of anorexia, such as high exercise, might be adaptations to starvation.

The symposium on homosexuality was one of the best. M. Bailey reviewed some of the theories about male homosexuality and the empirical evidence against them. Male homosexuality occurs with a one to four percent prevalence. It's universal across all cultures. Bi-sexual orientation, as opposed to behavior, is rarer than homosexuality. There are childhood antecedents. As adults, these men are feminine in their interests. They tend to be later born. He explored the notion of correlation. Are the traits associated with homosexuality advantageous to heterosexual relatives? The main traits are childhood gender non-conformity and adult occupations and recreational interest being more feminine. He said correlation is not supported by twin studies.

The second theory he addressed was the notion of kin selection. By this reasoning male homosexuals would make sacrifices that would allow relatives to reproduce more, the "kind gay uncle" syndrome. Greater investment by male homosexuals in siblings is not proved. Psychological mechanisms to nurture appear to be no more frequent in male homosexuals. Male homosexuals are feminine in some ways, but not in nurturance. He raised the hypothesis of developmental instability hypothesis. This idea calls for an accumulation of damaging mutations leading to developmental instability. There is some suggestion of this in the greater

left-handedness in male homosexuals and and increased asymmetry.

One of the most outstanding presentations of the conference was that of Ray Blanchard of Toronto, Canada. He presented overwhelming data that birth order and male homosexuality are associated. The odds of being homosexual were increased with having older brothers. Older sisters had no effect. Paternal or maternal age had no effect, and there was no sibling effect on female homosexuality. His conclusion was that the mother's immune system would be the most capable of remembering male fetuses. The antigen would have to be one produced by male fetuses and could cross the placental blood barrier to the mother. The antigen would have to affect the developing brain and be linked to the development of sexual dimorphic behavior. It must be antigenic to females and not to males. The tissue distribution of the antigen must include neurons in the fetal brain. Maternal antibodies to the hypothetical antigen must be capable of affecting development of the fetal brain without affecting the development of the gross anatomy. The principle candidate gene might be one of the male-specific, Y-linked histocompatibility antigens, often referred to as H-Y antigen. The H-Y antigen has some role in the sexual differentiation of vertebrates. It is usually present in the heterogamete and absent in the homogamete sex in mammals, i.e. present in males and absent in females. It has been highly conserved throughout vertebrate evolution. Fetal exposure to H-Y antibodies could affect subsequent sexual behavior in men.

Grandmothers help nurture

One of the best plenary sessions was saved for the final day. James O'Connell of Utah's department of anthropology presented an impressive challenge to the hunting/protein hypothesis of Homo sapiens evolution entitled "Grandmothering and the Evolution of Homo erectus."

Homo erectus was fully bipedal, had an intermediate life history, extensive foraging range, a high quality diet, and multi-male/female social groups. Hunting was important. Homo erectus were thought to show

such modern features as nuclear families, central place foraging, sexual division of labor, big game hunting by men, and paternal investment. The standard theory has been that with climate change there were fewer plant foods and more open country. Hunting was favored, this led to increased calories in the form of meat protein, which led to a change in anatomy and social organization. Male provisioning of meat to young led to greater paternal investment and increased male/female bonding. O'Connell and his colleagues are part of a recent challenge to the hunting hypothesis, and their work has just been published in the *Journal of Human Evolution*.

They believe that hunting was unrelated to the parental investment in chimps and humans. Homo erectus archeology does not indicate hunting or central place foraging. It is more suggestive of scavenging. In their hypothesis, the "Grandmother Hypothesis," senior women foraged and became important foragers when children needed to be provisioned. The ecological changes lead to life history changes.

Many of their observations come from work done with the Hazda who continue to live in the area of Kenya where many of the important fossils were found. They observed that children by five years of age forage for about fifty percent of their daily calories. Children's food is easily collected and processed. Mothers provision when the children's food is unavailable. This provisioning allows broader habitat use. It specifically allows grandmothers to affect the weanling welfare of grandchildren and their daughter's birth spacing. It has enormous implications for grandmother's fitness. They impact the mother's nursing status. They observed that better forager women have healthier children. In particular when women were nursing, the non-nursing children's health was better when they had a grandmother helping with food acquisition.

They believe this created selection for a long post-menopausal life span. With longer adult life spans this would contribute to later age maturity, larger body weight, later ages at weaning, and lower fecundity. But, if the grandmother is an important provisioner, there would be the later maturity, but earlier weaning and greater fecundity. He and his colleagues believe

that environmental changes would have led to limiting children's foods. The initiation of provisioning by grandmothers would enhance their daughter's fitness. This would have selection favor longer life spans, later maturity, and early weaning. This would be the departure from the chimp-like life history. Larger brains are associated with longer life spans (sixty to seventy years of age). The longer life spans lead to delayed maturity (matured about fifteen years of age), and delayed maturity leads to larger body size. Grandmother assistance leads to early weaning.

Also, in these hunter/gatherer tribes, forty percent of all women are post-menopausal and live long lives despite the absence of modern medicine. They believe the dramatic reduction in sexual dimorphism between Australopithecus and Homo erectus is caused by female's increased weight and size by about seventy percent. Cooler, drier, more seasonal conditions would be critical for children's food resource availability. About 1.8 to 1.9 million years ago, the climate changes would have created this. Tubers would become the newly exploited resource. They were widely available, high in carbohydrates, and had high return to foragers. They would be problematic for juvenile collectors, since they were deep, hard to get out, and had chemical defenses. This would lead to selection of upper body strength and endurance.

The discovery of fire would have been crucial to overcome the chemical defenses. There is considerable evidence for tuber use by erectus, and tubers' geographical distribution is about the same as the distribution of Homo erectus, fifty degrees north latitude. They believe that this accounts of the change in digestive anatomy. A grandmother could provide resources everyday. They noted that the hunting of large game by men is infrequent; Hazda men would hunt large game and skip small game which were available.

The Grandmother hypothesis paralleled Hrdy's stalk; the grandmother's assistance would favor matrilineal organization. In summary, they believe that hunting was secondary and not a catalytic event in the change from Australopithecus to Homo erectus, the increased body size and the increased group size. They be-

lieved the catalytic change was grandmothering and the control of fire. The control of fire allowed the processing of tubers to give quick, reliable and plentiful sources of carbohydrates. On reflection this makes a lot of sense to these two physicians. Why has no one had questioned the protein hypothesis on a simple physiological basis? Our brains, unlike the rest of our bodies, will only utilize glucose as an energy source. How could we have developed large brains if we depended on the gluconeogenesis from intermittent protein supplies?

Mating strategies

The Sunday morning paper sessions included: evolution of human life history; male sexual coercion and control; and topics in human sociality.

Neal Malamuth presented a paper that, in effect, suggested that there are evolved mechanisms or modules specifically for sexual coercion as opposed to domain general aggression and coercion. The next to the last paper in that section, "Dad's, cads, and patriarchs, was presented by S. A. Novak and L. T. Rodseth from Utah. They looked at the issue of "dad" and "cad" reproductive strategies in the context of father present and father absent situations. They presented an argument that this classification is inadequate for understanding domestic violence, which is generally high in father-absent societies, but variable in father present societies. The father-present category collapses two distinct male strategies, the dad pattern and what they have termed the patriarch pattern. The difference is the presence of female bonding and alliances. They point out that the patriarch strategies militate against female bonding. It is in these situations that, even though a father is present, there are high levels of domestic violence. Such problems are reported a problem in Utah.

In summary, this year's conference was full of ideas. All the abstracts are posted at the HBES web site and can easily be reviewed.

Commentary on HBES

by John Pearce

Counter-intuitive findings in human behavior are uncommon. At HBES there was a dandy one. As an aspect of sperm competition, men are fond of their partners after separation, and lust after them. Women do not feel this way themselves, but enjoy the fuss, though not understanding it. Adaptations shared by both sexes are generally understood. Sex-specific adaptations are not.

As to anorexia: The rate increases in societies that

1. have widely diverging mate values (CEO or laborer) and
2. postpone reproduction. Linda rightly points out that media sources intensify anxiety about mating competition. Have you browsed the magazines for young ladies? They are fierce! Then among the many women (almost all) that diet, some fall into the anorexia trap. Anorexia Nervosa does indeed look like an integrated adaptation for coping with starvation. Except that business of delusional fatness. But then you could say it is a solace to keep going... But then nothing really explains the food refusal. That seems more like some kind of stuck "set point". Apparently the occurrence of Anorexia Nervosa is just unpredictable. If it is an adaptation what makes it more likely to pop up in some rather than others? And why does it have a life of its own? The point that someone made (was it an hallucination of Russ Gardner?) was that resistance to controlling a girls eating is comparable to controlling an alcoholic. Therapeutic control does not work with alcoholics, but court-based legal coercion does. Control should be avoided until the starving has reached a certain point, then total coercion should be the policy. Though as a practical matter this is the way to go, one problem occurs: girls regularly tolerate and mostly bend to familial coercion, especially by other females, in regard to sexual matters. It would be interesting if the eating rebels were also sexual rebels.

Randy Nesse has always been conservative, and one reasonable critique of his appealing but somehow torturous view is that it is a defense against the appalling insights of EP. Overall, what stands out most vividly about the whole HBES is how fruitful the hard core notions of natural selection have been. Trivers is a good example of what I mean by Hard Core. See his caustic critique of David Sloan Wilson in *The Skeptic*.

HBES Comment & Piano Effects

by or about James Brody

Demographic transition is consistent with sociobiological descriptions of K-Selection in which fewer offspring are produced but there is greater parental investment in each of them. K-selection appears to be associated with population levels that are near the carrying capacity for a particular setting. A "genes" model would suggest that females (and males?) are less dependent on having lots of children and cut back reproduction by any number of mechanisms under conditions of environmental stability.

About Jim Brody: from a message to him from Dr. Don Beck: I relayed the information you posted on the youth initiative around drugs to John Longstreet, Mayor of Plano — the affluent community next to Dallas. Plano had serious problem with heroin deaths. See how your posting spread to the Plano Mayor, and how he will take steps to implement the program you described. Thanks a lot Jim. This shows how the contributions you are making radiate far.

Dr. Brody hit on something when he mentioned that we have no role for young people that utilizes their skills. We confine them in rooms for hours, and waste much of their time, and they know we are wasting their time. Two years ago, adults in our town met to agonize about the persistence of drug abuse among our children. We had adopted all the recommended educational programs over a decade before, but the statistics about substance abuse had not changed. We decided to change ourselves instead. We realized that drug abuse was about three things: peer pressure, boredom, and coping with the pain.

The town developed better methods of identifying children in pain, and rendering assistance, but this was not enough. We had to give them a role: something to do. Youth commissions were formed with funding, and the purpose of developing activities. More important, we opened up positions on our government boards, commissions, and committees for high school and college students. Non-profit groups also made openings on their corporate boards and committees. In a small town, this is how we rule, and we decided to regard our young

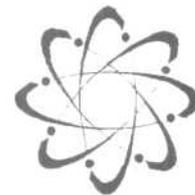
people as rulers in training. There is very little we do on such boards and commissions that cannot be done by young people. This changed things. Many of our children became too busy to get bored. If they were in pain, they were now in the power centers that could change things. If they looked to their peers, they found others performing adult roles, and not just drug dealers or gang leaders. They had more impressive peers to emulate.

Human Kin-Recognition: an Integrated Paradigm

by Mark Erickson

Abstract (for ASCAP Annual Meeting, Aug 6, 1999):

An important but unaddressed question in the study of human kin recognition is whether different classes of kin-directed behaviors, e.g., incest avoidance, attachment, altruistic behavior, are integrated by a single mechanism or function independently of each other. Research from disparate sources provides insight into this question. Anthropological studies indicate that close association, when at least one member of a dyad is within a critical period of 0-2.5 years, establishes incest avoidance. Attachment studies suggest that a similar critical period exists for attachment and that the quality of early attachment, secure vs insecure, predicts an individual's later predisposition for kin-directed altruism. Clinical studies further suggest that the quality of early attachment also predicts a later propensity for incest avoidance. These findings argue that the qualitative characteristics of association, during an early sensitive period, modulates early attachment and later kin-directed altruism and incest avoidance, in predictable ways through the life-span. Thus, behaviors that indicate kin-recognition appear to be integrated.

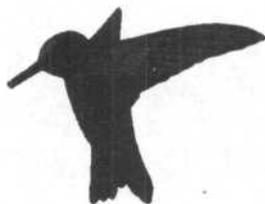


A Switch to The Hedonic Mode

Most readers of *ASCAP* must by now be familiar with the concept of the "two modes", the brainchild of our first *ASCAP* Society President, Michael Chance. Every now and then one comes across a description of the two modes, and sometimes of switching from one mode to the other, using other language; and then I am impressed how the two mode concept is invariably a better descriptor than the language used by other theorists.

A short "filler" in the *British Medical Journal* described what I think is a switch from the agonistic to the hedonic mode. Tony Fox from Rancho la Costa in California put up a humming bird feeder in his new house.¹ He wrote:

"...within five minutes of feeder installation, the first humming bird arrived. Within two hours, five of them were competing for this new food source hanging under the eaves of our house. "Usually, humming birds are extremely territorial. A dominant male will vigorously defend, for hours on end, an artificial feeder, or even a single fuchsia plant. To my surprise, the dominant hummingbird at this new house had an entirely different strategy from the one who was king of the feeder at the old place. This new chap sat on top of the feeder, thus being dubbed Snoopy by our young German guests, and drove off any competitor who attempted to feed three inches below. The boss at the old house perched and chirped in a nearby tree, and attacked his competitors at high speed, developed by diving from his sentinel position.



"And then it happened. Just after sunset, the belligerent Snoopy permitted no fewer than five other hummingbirds to share the four feeding apertures. In a moment, the ingrained, reproducible behaviour of a unique hummingbird had changed into exactly the opposite."

This switch from intimidation to sharing is the sort of thing we mean by a switch from the agonistic to the hedonic mode; the fact that it occurs in nature, and can be recognised as a category of behavioural change, is, I think, further justification for the "two mode" concept.

The vignette also describes two types of within-species variation in behaviour: the old despot and the new despot had different perching strategies; and, secondly, only the new despot manifested the agonistic/hedonic switch. The reason for the switch, and possibly for the variation in switching, is given by the author:

"Hummingbirds need a lot of food in the evening. They then roost and drop their body temperature. This bedtime calorie load and reduced metabolic rate enables them to survive the night."

Comment

It looks as though the dominant hummingbird was in a trade-off situation between personal fitness and inclusive fitness. Although he wanted all the nectar for himself, when the time came near to roosting, he maybe could not finish it all himself, and he could afford to share it with his competitors, who may have been close relatives, in order to help them too to survive the night. He could assume that when he awoke from sleep the next morning, the fuchsia/feeder would have replenished the supply of food, and then he could feed greedily and selfishly alone.

In red grouse the dominant territory owners defend their territories for the first two hours of the day, driving off male rivals, females and juveniles; after that they allow subordinates to feed freely on their patches.² This is

also a switch from the agonic to the hedonic mode, and perhaps evolved for the same reason as the hummingbird switch. Individual variation in this behaviour has not been reported in red grouse (but should be looked for).

Some animals like the wolf spend the breeding season in the agonic mode and then revert to the hedonic mode when not breeding. One lemur, once a year, switches to the hedonic mode at full moon.³

When behavioural variation occurs within a species, we look for the operation of negative frequency dependent selection. If a behaviour becomes more successful as it gets rarer, variation will be maintained; but if the opposite occurs, variation will be selected out, and then we tend to see variation between closely related species. It seems likely that the agonic/hedonic switch would show positive frequency dependent selection, because a single despot showing mercy to subordinates would be crowded out and would be likely to fare badly. Our deduction from this is that the hummingbird despots in the old and the new houses were from different species. What about it, hummingbird aficionados?

The two modes revisited

In the agonic mode, the individual is oriented towards agonistic behaviour (fighting, fleeing or submitting). In the hedonic mode, the individual is oriented towards a task, such as feeding or nest-building, or, in relation to conspecifics, towards co-operating, sharing or mating. In most animals, social competition is synonymous with the agonic mode, while the hedonic mode is characterised by co-operation, or at least mutual tolerance.

In our own species, however, and to some extent in chimpanzees, competition also takes place in the hedonic mode - we have called this prestige competition - and it is characterised by being attractive to fellow group members who act as a sort of panel of judges or evaluators, allocating differential prestige to all group members. This results in a status hierarchy of prestige which may be different from the dominance hierarchy based on intimidation, in both humans and

chimpanzees.

Since humans can compete in the hedonic mode, we need to spend less time in the agonic mode. In fact, we do not need the agonic mode at all, but it is with us in the way that other obsolete characters are. Animals who are unable to compete in the hedonic mode need the agonic mode to sort out their differences of opinion about territory and rank, as is the case with the red grouse; but the quicker they can get it over with it, the better. Other species, such as the hummingbird, not only use the agonic mode to create asymmetry between dominants and subordinates, but also use it to maintain differential payoffs between dominants and subordinates - possibly because nectar is scarcer for the hummingbird than heather for the grouse. And so the red grouse can enjoy over twelve hours of hedonic mode per day, compared with half an hour or so for the hummingbird.

Just as groups can be in one or other mode, so dyadic relationships (such as marriage) can switch backwards and forwards between the two modes. Switching to the agonic mode is called "having a row". Switching back to the hedonic mode is called reconciliation. The Iranians even have names for the two states: the agonic mode in a relationship is called "qahr", the hedonic mode "ashti"; everyone knows which relationships are in qahr and which in ashti, and there are appropriate roles, such as mediator, for friends to adopt.

Resolutions with couples

One important difference between a group and a dyad is that in a private relationship there can be no prestige competition (because there are no spectators/evaluators/judges). Therefore the main work of competition (allocation of rank and territory) has to be decided by other means, either by fighting or by negotiation. Because negotiation is so difficult (and recent in evolutionary terms), disputes are often settled by fighting. Which is why "marital disharmony" is so common.

The whole question of society's attitude to marital disharmony and dominance problems is fascinating.

Alexander Pope caught the enigma well:

She who ne'er answers till a husband cools,
Or, if she rules him, never shows she rules;
Charms by accepting, by submitting sways,
Yet has her humour most, when she obeys.

Pope A; Epistles to Several Persons.
Epistle 2: To a Lady

There are adages such as "only a fool interferes between husband and wife". Of course, society lays down general guidelines about who should be dominant, and until recently it was the husband. This clear instruction must have saved a lot of fighting, at the cost of undesired subordination on the part of wives. But there were anomalous examples, such as Bishop Proudie and his wife portrayed by Trollope, and other cases in which the wife gained power by ingenious means. But the failsafe was fighting, and this is the ultimate cause of the paradoxical situation that agonistic behaviour which evolved as a male characteristic, or at least as intrasexual behaviour related to sexual selection, is now seen predominantly between the sexes, in situations in which sexual selection is not occurring. As they say in Mexico, "Marriage is the only war where one sleeps with the enemy."

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1. FoxT: A salutary lesson: patients sometimes behave like our Snoopy. *Br Med J* 1999;318:1131.
2. Wynne-Edwards VC: Social selection in *Lagopus scoticus*. In DC Glass (Ed.): *Genetics* (Biology and Behavior Series), New York: Rockefeller UPress, 1968, pp. 143-164.
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Editor's Note

Another reference to Dr. Chance's work (though indirectly and without attribution) occurred in *USA Today* 6/24/99 in a column by Robert Sapolsky. He refers to the departure from hedonic circumstances that happened with agriculture about 10,000 years ago, thereby inventing a stratified society and poverty.

Sapolsky RM: Poverty separates man from ape. USA today, June 24,1999, page 15A.

Extract: [I]f you want to be healthy and live a long life, you should [not be] poor.

Among most primates, there... is a dominance hierarchy... built around resources being divvied up unevenly.... Numerous studies have suggested that being subordinate... exacts a physiological toll among primates. Subordinate monkeys have.... elevated levels of stress hormones. But... if., you ask, What is the relationship between social rank and disease... among primates?" It turns out that the answer would have to be "It depends."

It depends on how stable the dominance hierarchy is: When ranking hierarchies go through revolutionary upheavals, dominant animals suddenly bear the brunt of the psychological stress. It depends on what subordination means in a particular species: Among some primates, subordination is enforced by aggression and intimidation by dominant animals, while in others subordination means being a kid sibling of a dominant individual, waiting your turn. It depends on what subordination means in a particular group: Do low-ranking animals get dumped on a lot in this part of the forest? Do they have friends?...

[In humans] studies has shown that the single most powerful lifestyle predictor of poor health is being poor [low socioeconomic status (SES)].... In America a person with one to eight years of education has nearly triple the risk of suffering from... disease as someone with a college education.... [T]his "SES/health gradient" is fantastically reliable... [not] just... brutality of capitalist inequities; it's still there in socialist countries or in ones with universal health coverage;... [not] just ... due to nutrition or housing issues; in...nuns who had shared housing and meals for 50 years, SES differences in their youth predicted their geriatric diseases and longevity...

With humans, the SES/health gradient comes with few "it depends." In a wide range of societies, health care systems and differing life styles, poverty is a terrible health risk, a sledgehammer.... Somewhere back when humans invented agriculture... there were all

sorts of unique consequences — surplus goods and soon the uneven distribution of surplus goods and thus, the stratification of society. The invention of "haves" and "have nots."

Thought Experiment of Unequal Distribution at a Dinner

by Russell Gardner, Jr.

Madelaine Robbins and I are thinking of a presentation to be made to a business group. We would like to tell and demonstrate application of ancient determinants of behavior that affect people in organizations. Social rank hierarchical behaviors are ancient, for instance, and part of the human genius concerns how we get along often fairly amicably despite this. Somehow, with a large brain many of us hold in check the push to feel not equal at all but superior. Thucydides, the Greek historian, said, "Of the Gods we believe, and of men we know, that by a necessary law of their nature, they rule whenever they can." In every social interaction social rank hierarchy has a place, as seen in every "thank you" and "you're welcome," each signaling the wish to make our encounters fruitful ones.

Michael Chance developed that in scarce resource human economies extraordinary dominance is held in check because no one alpha can gain sufficient allies to hold more than temporary sway. He noted groups with sufficient but not excessive resources are happy and could be called by the agreeable designation of hedonic (which he contrasted with the punishing agonistic mode held together by aggressive tactics).

As developed by Sapolsky in the material just preceding this, consensus exists that humans departed from scarce resource economies with agriculture. With grain and domesticated animals, societal stratification evolved in the Fertile Crescent. With much resource, an alpha could ensure that she/he and descendents could pay allies. The human primate more than others assured a permanent status for the poor (and consequent health problems). The ancient invention of social rank hierarchy has a different realization of such stratification in people depending on the simple factor of resource abundance.

And not only primates. Calhoun showed it in rats too. In the 1940s, he provisioned a colony for over two years and looked at them daily. His description portrayed a social rank hierarchy with an upper class of animals well able to defend their territories near the food supply area. This existed along with a hellish agglomeration of lesser status animals that showed social breakdowns and poorly tended nests. Females had no peace during estrus, pregnancies often aborted.

Now how do humans doing well get along in a way that allows freedom from harassment and considerable pleasure, as at public gatherings, let us say, banquets? Well, this came to mind because Madelaine and I have to provide a three hour program but one that included a dinner in it. How might we make that dinner into learning? We considered that the wait-staff be instructed to provide unequal distributions of food, for instance, one person at a table receiving a tiny portion. After some time had gone on for awhile, the arrangement would be announced, the inequalities repaired and hedonic atmosphere (hopefully) restored.

We ran this as a thought experiment past colleagues who had gathered in Boston and Cape Cod. Most felt that feelings would be very intense though different groupings would handle it differently, some volunteering more portions to those receiving the lesser amounts, for instance. Most worried that the feelings would get out of hand if not overtly and publicly, then privately. When the disclosure came people would feel duped. Sense of embarrassment may remain after our departure. This result of our thought experiment caused me some distress: our desire is that they leave instructed but also pleased, that the whole thing reflect Chance's hedonic mode.

So what do you think of the following variant: we don't actually vary the food but tell our audience-diners about the experiment with the instruction that they discuss it while eating their equal portions. This would preserve the wait-staff from any unpleasanties and the diners from their own anger. Reactions to the imagined experiment would be subjected to large group discussion after the meal is over, as a final wrapup. Let us know what you think. We're curious.

Migration Patterns of Hominids Like Those of Other Mammals

Email exchanges following John Skoyles' insights about the origin of language, and his discovery of the brilliant work of Adriaan Kortland, indicate that he is on the same trail that I travelled about a quarter of a century ago, and recorded first in my book, *Life Strategies, Human Evolution, Environmental Design* in 1978,¹ and then in a summary paper and update in 1994.²

Before I get to the palaeoecological setting within which vocal mimicry was highly adaptive, let me briefly set the stage.

I argued that hominid evolution followed the same pattern as did other lineages of large mammals. There were bursts or evolutionary novelty, separated by long periods of efficiency selection that refined the new adaptations, that took hominids stepwise from the forested tropics, to the tropical savannah, to the dry steppe and from there into cold temperate, later the periglacial and finally into Arctic climates. The most difficult transition by far for a large primate was from savannah to steppe, and only hominids among primates mastered it and went beyond. This transition, I might add, was easily accomplished by ungulates innumerable times. The evolutionary step from savannah to steppe turned an ape into a human.

Two huge problems confronted hominids adapting to the steppe: Firstly, how to maintain continuity in obtaining high quality food to sustain long periods of gestation and lactation, despite the severe disruption imposed by the long dry season? This problem was solved by following retreating plant resources underground by developing technology (digging sticks and stone tools to make digging sticks), by supplementing the inevitable protein deficits by evolving organised hunting and the appropriate social system that distributed the meat in support of the hunters reproductive fitness that is the origin of many human attributes.

Secondly: how to regularly survive nights without access to trees or cliffs? This had to be accomplished despite a high density of large predators and despite the night being the period of heightened activity by large carnivores for which hominids were no match. The solution to that problem, I suggested, was to take advantage of the predators noticeable disinclination to risk injury. Predators tend to have excellent weapons of offence but poor physical defences as such impede efficient hunting. Injury risks the loss of hunting ability and thus the starvation of the injured predator. Consequently, predators tend to be hypochondriacs.

The first step in this direction is to surround oneself at night with a thin wall that deprives the inquisitive predator of information. A thin walled complete shelter would likely be treated by carnivores as a "solid structure". Next, loud, harsh, deep sounds emitted from within the thin walled structure would be an additional deterrent. This deterrent however could be infinitely increased in potency by mimicking the defensive vocalization of the inquisitive predator. Since in most animals (though not humans) an attack is inevitably followed by instant retaliation, an aggressor always risks tit for tat and serious wounding, winding up as injured as his victim. Consequently, fighting with a conspecific is judiciously avoided. Thus a predator, unable to sense adequately through the wall, confronted by all too familiar threat vocalisations, and such being augmented by a number of very loud voices uttering these in unison, is most unlikely to risk reaching through the thin wall for a meal. That is, being vocally versatile, being able to mimic the specific threat sounds of predators, and to vocalize loudly in synchrony, would have been a means of hominids surviving at night.

Kortland in 1980 added the vitally important concept of using thorns for the thin walled envelope at night, really parasitizing hypochondriac inclinations in

predators. To this I added in 1994 the obvious idea of a powerfully jabbing an unconvinced predator with a sharp (digging) stick through the thorn wall. That's merely an extension of the idea of thorns into a super-thorn. It would be another potent means of discouraging predators coming too close. No matter what the predator, vocal mimicry can quickly match its threat vocalizations.

My *Life Strategies* book is now hard to get find, but I have described the evolutionary paths from tropical resource defenders to periglacial Ice Age giants in another family, the Cervidae or deer.³ The point is that the human lineage shows the same evolutionary steps from tropic to arctic as do so several lineages of the Cervidae, as well as other mammalian families. That is, zoologically, *Homo sapiens* is comparable to other terminal Ice Age species, such as woolly mammoth or rhino, giant deer, moose, or polar bear. We are in our size, braininess, fatness and enhanced evolution of luxury organs as typical an Ice Age mammal or Grottesque Giant as are these.

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2. Geist V: Culture and its biological origins: a view from ethology, epigenetics and design. In: R. Allen Gardner, Beatrix T. Gardner, Brunetto Chiarelli and Frans X. Plooi (Eds): *The Ethological Roots of Culture*, Dordrecht, Netherlands: Kluwer Academic Publisher,. 1994, pp. 441-459
3. Geist V: *Deer of the World*. Stackpole Books, 5067 RitterRoad, Mechanicsburg, Pa., 17055 USA and Airife Publishing Limited, 101 Longden Road, Shrewsbury SY3 9EB, Shropshire, UK.,



Jensen JV (translator: Chater, AG): *The Long Journey*. New York, NY: Alfred A. Knopf, 1923, pp. ix-x

Extract: When at last the ice was melted and had retreated towards the Pole it had ground the mountains of Shoane off the face of the earth, right down to their roots, and had deposited them as shingle in the Baltic; centuries of torrential rain ... furrowed the tundra, and to the cold land that was exposed when the mills of the ice had ceased, man returned and began to learn in the school of adversity, the elements of a new kind of life—though the memory of life's carefree dawn was never lost...

So great are the contrasts that have formed man's nature. But not all were thus formed. The Ice Age marked the division; it was the cause of the parting of mankind on its journey into two distinct roads, since one body remained in the North and took up the struggle with harsh conditions, became transformed, grew in humanity inwardly and upwards; while the rest turned aside from adversity and fled instead of growing; they lost themselves to the southward, followed the warm climate and continued to be the naked jungle folk they were in the beginning; even today their descendents live in their primitive state in the tropics.

The old warm forests of Northern Europe were razed by the ice, like the volcanos of Skoane; but man retained the fire, the hearth. In time the Northerners had new forests to dwell in, the cool leafy forests of the North; in their shade and in constant mists our ancestors grew up. A firmly rooted but restless folk; time after time, in prehistoric and historic days, the forgotten tradition of the Lost Country, still persistent in their blood, drives the Northerners from their wintry dwelling places towards the South and brings them to prosperity in warmer climates. But as Northerners they are lost in their new home; they become absorbed in other peoples and lose the germinating power of their nature, which is bound by their destiny in the North and to a beneficent yearning to leave it. This is the history of the Migrations, of the Vikings, of the Normans. A primitive instinct finds vent in voyages; the forests change into the Ship.

ABSTRACTS & EXTRACTS ...

Buck R: The biological affects: A typology. *Psychological Review* 1999; 106:301 -336.

Abstract: This typology of biological affects is based on developmental-interactionist theory of motivation, emotion, and cognition, *Affects*-subjectively experienced feelings and desires - involve interoceptive perceptual systems based on primordial molecules that characterized neurochemicals. Biological affects involve primary motivational-emotional systems (primes) associated with hierarchically organized neurochemical systems in the brain, including subcortical (reptilian) and paleocortical (limbic) brain structures. Affects fulfill individualistic (selfish) functions (arousal, approach-avoidance, agonistic) and prosocial (cooperative) functions. Selfish and cooperative functions are associated respectively with the right and left hemispheres. Biological affects constitute the physiological bases for higher level affects: social affects (e.g., pride, guilt, shame, pity, jealousy), cognitive affects (e.g., curiosity, surprise), and moral affects.

Akiskal HS: Toward a definition of generalized anxiety disorder as an anxious temperament type. *Acta Psychiatrica Scandinavica* 1998;98(Suppl.393):66-73.

Abstract: Generalized anxiety disorder (GAD) is defined as an uncontrollable disposition to worry about one's welfare and that of one's immediate kin. Associated manifestations include arousal, vigilance, tension, irritability, unrestful sleep and gastrointestinal distress. There is a growing evidence for the lifelong nature of this condition among many of its sufferers. This and other evidence reviewed in the present paper provide further support for the thesis that the chronic disposition to worry should probably be classified under constitutional or trait anxiety. GAD is best considered an exaggeration of a normal personality disposition that can be named 'Generalized anxious temperament' (GAT). Despite some overlap with anxious-phobic, inhibited and avoidant-sensitive

temperaments, GAT seems to have a distinct profile with altruistic overtones; on the other hand, GAT is less easily distinguished from harm-avoidant and obsessive traits. That worrying would increase upon relaxation is not a paradox at all, and is understandable from an ethological perspective as subserving the defensive function of being vigilant of ever present yet uncertain external dangers—to oneself and one's kin—in living in day-to-day living. GAT could be thus be considered as 'altruistic anxiety', subserving hypothetically the survival of one's extended phenotype in a 'kin selection' paradigm. Only when extreme does worrying manifest in a clinical context, impairing one's interpersonal life and functioning at work and increasing use of general health care resources. Furthermore, generalized anxiety appears to predispose to and is often associated with depression, and a spectrum of phobic disorders, as well as alcohol and sedative use. These considerations place GAD (and the putative GAT) in the limelight and underscore the need for more research into its fundamental characteristics. Towards this aim, a self-rated GAT measure under development in our center is provided in an appendix to this paper.

Mazure CM: Life stressors as risk factors in depression. *Clin Psychol Sci Prac* 1998;5:291-313.

Abstract: Compelling evidence for an association between major adverse life experience and subsequent major depression is reviewed. Determining individual vulnerability to life stress and the effect of stressors on treatment outcome in depression are highlighted as the next major targets for contemporary stress research. Methodological concerns in the evaluation of stressors are detailed, and available data on variables that may influence the stress-depression relationship are presented. The critical importance of multivariate models in understanding individual vulnerability and outcome is emphasized. As methods for ascertaining stressful life events and chronic stressors continue to be refined, and models addressing the complex

relationship of stressors and depression continue to be developed, prediction of stressor effects in onset and outcome of major depression will become increasingly precise.

Martin W, MullerM: The hydrogen hypothesis for the first eukaryote. *Nature* 1998;392:37-41.

Abstract: A new hypothesis for the origin of eukaryotic cells is proposed, based on the comparative biochemistry of energy metabolism. Eukaryotes are suggested to have arisen through symbiotic association of an anaerobic, strictly hydrogen-dependent, strictly autotrophic archaeobacterium (the host) with a eubacterium (the symbiont) that was able to respire, but generated molecular hydrogen as a waste product of anaerobic heterotrophic metabolism. The host's dependence upon molecular hydrogen produced by the symbiont is put forward as the selective principle that forged the common ancestor of eukaryotic cells.

Extract: [Two] hypotheses embrace the view that the host of mitochondrial symbiosis was a eukaryote. Neither hypothesis examines specifically what type of energy metabolism the ancestral eukaryote and its antecedent(s) may have had, but rather assume the host was heterotrophic before the acquisition of mitochondria. Here we summarize energy metabolism in non-photosynthetic eukaryotes and put forward an explicit inference as to its ancestral state. The result of that inference is a hypothetical, primitive eukaryotic cell with surprising attributes.....

We firmly predict that evidence for a strictly In-dependent ancestry, and most probably a methanogenic ancestry of the host should be ultimately revealed by comparative genomics.... anaerobic heterotrophic habitats devoid of geological hydrogen may harbour eukaryotes more primitive than known forms, the metabolism of which should be accountable for under the premises stated here.

Edwards AWF (from Gonville and Caius College, Cambridge): **Forced evolution.** *Nature* 1995;376:11.

Extract: Readers of *Gulliver's Travels* will recall the genetic algorithm employed by the Professor of Speculative Learning [at the Grand Academy of Lagado]

and his 40 graduate students according to which, by the artificial selection of words randomly generated by tossing wooden blocks in a frame, "the most ignorant person may write books without the least assistance from genius or study".

"Six hours a day the young students were employed in this labour, and the professor showed me several volumes in large folio already collected, of broken sentences, which he intended to piece together, and out of these rich materials to give the world a complete body of all arts and sciences; which might however still be improved, and much expedited, if the public would raise a fund for making and employing five hundred such frames in Lagado, and oblige the managers to contribute in common their several collections."

It is not known whether the professor's grant application succeeded, but it is known that Charles Darwin read *Gulliver's Travels* at Maer Hall between June and November, 1840.

Beck RA: Artists' offspring. *Nature* 1992;356:189.

Extract: The possibility artists have more sons than daughters is suggested by a count of the following resources:

- (1) those for whom the relevant information is included in *Who's Who in Art*, 24th edition (which covers artists, designers, craftsman, critics, writers, teachers and curators);
- (2) those mentioned in the obituary section of the above publication for whom the relevant information can be found in *Who's Who in Art*, 19th edition;
- (3) those artists and craftsmen in the 1985 to 1990 volume of *The Annual Obituary for whom* relevant details can be found therein. (Sons and daughters of artists in both (2) and (3) are counted once only.

The total numbers of sons and daughters, including deceased children but excluding stepchildren, are 1,834 and 1,640 respectively, giving a sex ratio of 1.1183. A control experiment was carried out involving a count of the sons and daughters recorded in the general *Who's Who*, the aim being to expose any

male (or female) bias in reporting offspring: the sex ratio for the first 4,002 offspring was 2,046/1,956 = 1.0460. This is close to the 1.0534 ratio which applies to British births generally (based on statistics of 723,093 births published in the *1987 Demographic Yearbook* and suggests that there may be no significant male bias in reporting offspring in biographical reference books. Comparing then the sex ratio of the artists' children in (1) - (3) against the sex ratio of the British births generally, the X^2 value is 3.0173, giving a probability $P = 0.085$ approximately. Further work on correlations between parentage and the sex of ratio of offspring appears desirable.

Jones IL, Hunter FM: Mutual sexual selection in a monogamous seabird. *Nature* 1993;362:238-239.

Abstract: Darwin believed that elaborate ornamental traits expressed in both sexes might be favoured by mutual sexual selection driven by both female and male mate choice. Experimental studies on birds and fish have shown that male ornaments can be favoured by female mating preferences. But the concept of mutual mate choice has remained untested experimentally, although it has been supported by recent modelling. Here we report the results of a study of mate preferences of the crested auklet *Aethia cristatella*, a monogamous seabird in which both sexes are ornamented. In two experiments we recorded the sexual response of male and female auklets to realistic opposite-sex models with crest ornaments experimentally shortened and lengthened within the range of natural variation. Males responded to accentuated female models with more frequent sexual displays, as did females to accentuated male models, confirming the idea that ornaments expressed in both sexes could be favoured by mutual mating preferences.

Swenson JE, Sandegren F, Soderberg A, Bjarvall A, Franzen R, Wabakken P: Infanticide caused by hunting of male bears. *Nature* 1997;386:450-451.

Extract:... [K]illing of adult males can reduce population growth if, for example, immigrant males that replace removed resident male kill the young. In a field study of brown bears, *Ursus arctos*, we have

found that killing one adult male had a population effect equivalent to killing 0.5 to 1 adult females. This may be a general phenomenon in species showing this kind of infanticide....

[A]n immigrating male replacing a dead individual may increase his reproductive success by killing existing cubs, as this can shorten the interval to a female's next conception. We observed that young were lost primarily during the breeding season of May-June (15 of 20 cubs lost, $X^2_c=15.96$, d.f.=1, $P=0.0001$). This loss shortens the time to next conception - 8 of 10 females that lost all young gave birth the following year, compared with none of 40 that successfully raised cubs ($x^2_c=32.37$, d.f.=1, $P=0.0001$). The sexually selective infanticide hypothesis predicts that survival of cubs less than 1 year old would be lower after a resident adult bear is killed. We tested this using a retrospective experiment... in Sweden. ... Bears commonly kill cubs - we observed one death by a male, and suspected another on the basis of tracks. ...

Cub survival was lower in the treatment area (0.72, N=74) than the control area (0.98, N=50; $X^2_c=12.48$, d.f.=1, $P=0.0004$). Also in the treatment area, cub survival was lower in both 0.5 and 1.5 years after adult males had been killed, but not after 2.5 years. This indicates that the social organization of males was unstable for 1.5 years after losing a resident male. ... [Established adult males killed fewer cubs.... Our results cannot be explained by bear density or female condition.

Kempmann G, Kuhn HG, Gage FH: More hippocampal neurons in adult mice living in an enriched environment. *Nature* 1997;386:493-495.

Abstract: Neurogenesis occurs in the dentate gyrus of the hippocampus throughout the life of the rodent, but the function of these new neurons and the mechanisms that regulate their birth are unknown. Here we show that significantly more new neurons exist in the dentate gyrus of mice exposed to an enriched environment compared with littermates housed in standard cages. We also show, using unbiased stereology, that the enriched mice have a larger hippocampal granule

cell layer and 15 per cent more granule cell neurons in the dentate gyrus.

Reznick DN, Shaw FH, Rodd FH, Shaw RG: Evaluation of the rate of evolution in natural populations of guppies (*Poecilia reticulata*) *Science* 1997;275:1934-1937.

Abstract: Natural populations of guppies were subjected to an episode of directional selection that mimicked natural processes. The resulting rate of evolution of age and size at maturity was similar to rates typically obtained for traits subjected to artificial selection in laboratory settings and up to seven orders of magnitude greater than rates inferred from the paleontological record. Male traits evolved more rapidly than female traits largely because males had more genetic variation upon which natural selection could act. These results are considered in light of the ongoing debate about the importance of natural selection versus other processes in the paleontological record of evolution.

Shoemaker PJ: Hardwired for news: Using biological and cultural evolution to explain the surveillance function. *Journal of Communication*, 1996;46:32-47.

Abstract: Builds a theoretical argument to explain both why human beings are interested in news and why so much news content involves the identification of environmental threats and deviance. The author suggests that it is characteristic of all humans, not just journalists, to monitor the world around them, which H. D. Lasswell (1960) termed the "surveillance-function of the news. The central theses discussed include (1) that the desire to receive and transmit information about the environment is both biologically and culturally derived, and (2) that both biology and culture have had a profound impact on the form that news content has taken. Theories of biological and cultural evolution, and evolutionary psychology are discussed in relation to the development of communication and the shaping of the news. It is suggested that if human brains are "hardwired" to survey their environment and to prefer news about deviant and threatening events, then it may be understood how journalists' selection of deviant or bad news may reflect a biological disposition to such news and not

just a peculiarity of journalists.

Sugiyama MS: On the origins of narrative: Storyteller bias as a fitness-enhancing strategy. *Human Nature*, 1996;7:403-425.

Abstract: Discusses how representations (e.g., rumor, propaganda, public relations, advertising) of the social environment can be used to influence the behavior of others. Storytelling can be seen as a transaction in which the benefit to the listener is information about his or her environment, and the benefit to the storyteller is the elicitation of behavior from the listener that serves the former's interests. However, because no two individuals have exactly the same fitness interests, different storytellers would be expected to have different narrative perspectives and priorities due to differences in sex, age, health, social status, marital status, number of offspring, and so on. Tellingly, the folklore record indicates that different storytellers within the same cultural group tell the same story differently. Furthermore, the historical and ethnographic records provide numerous examples of storytelling deliberately used as a means of political manipulation. This evidence suggests that storyteller bias is rooted in differences in individual fitness interests, and that storytelling may have originated as a means of promoting these interests.

Cummings JL; Review. Principles of neuropsychiatry: towards a neuropsychiatric epistemology *Neurocase*, 1999;5(3):181-188.

Abstract: Depression, mania, obsessive-compulsive behavior, psychosis and personality changes are common manifestations of brain disorders. These neuropsychiatric syndromes exhibit rule-bound relationships to brain dysfunction and occur most commonly with lesions of the limbic system or frontal-subcortical circuits. They reflect disruption of mechanisms mediating fundamental functions such as mood, emotion, motivation, self-protection and social affiliation. Lesional factors (i.e. size and location of lesion, disruption of transmitter systems) as well as host-related non-lesional factors (i.e. family history of psychiatric illness, age of onset of neurological condition, gender) contribute to determining which

patients with specific neurological conditions develop associated neuropsychiatric disturbances. Investigations of the psychiatric aspects of neurological disease and the neurobiology of psychiatric disorders indicate that similar anatomical regions are involved when these conditions have the same symptoms. These principles comprise the basis of an evolving neuropsychiatric epistemology.

Wolpert DM, Goodbody SJ, Husain M: Maintaining internal representations: the role of the human superior parietal lobe. *Nature Neuroscience* 1998;1:529-533

Abstract: In sensorimotor integration, sensory input and motor output signals are combined to provide an internal estimate of the state of both the world and one's own body. Although a single perceptual and motor snapshot can provide information about the current state, computational models show that the state can be optimally estimated by a recursive process in which an internal estimate is maintained and updated by the current sensory and motor signals. These models predict that an internal state estimate is maintained or stored in the brain. Here we report a patient with a lesion of the superior parietal lobe who shows both sensory and motor deficits consistent with an inability to maintain such an internal representation between updates. Our findings suggest that the superior parietal lobe is critical for sensorimotor integration, by maintaining an internal representation of the body's state.

LeMay M: Asymmetries of the skull and handed-ness: Phrenology revisited. *J. Neurological Sciences* 1977; 32:243-253

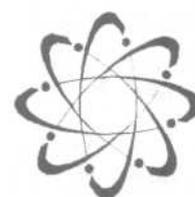
Abstract: Some of the studies of the asymmetries noted in cerebral computerized transaxial tomography (CTT) studies are reflected in the shape of the skull resulting most often in backward protrusion of the occipital bone on the left and a less striking forward protrusion of the right frontal bone. Asymmetries are less marked in left-handed individuals but the opposite features, i.e., forward protrusion of the left frontal bone and posterior of the right occipital bone, are more frequent in left handers than in right handers.

LeMay M, Culebras A: Human brain - morphological differences in the hemispheres demonstrable by carotid adenography. *New Engl J Med* 1972;287:168-170 with addenda pp 194-195

Abstract: Functional differences of the cerebral hemispheres are great, but few consistent morphological differences have been noted. On carotid arteriograms and on coronal sections of brains through the posterior ends of the sylvian fissures, we found the parietal operculum to be more highly developed on the left than on the right in 38 of 44 persons. However, arteriograms suggested that in 15 of 18 left-handed persons, right parietal opercularization is as great on the left. The study showed definite morphological differences between the right and the left hemispheres in a region of major importance for language. Endocranial casts of a fossil skull suggest these differences were present in Neanderthal man. Adenography offers a method of studying anatomical differences.

LeMandola NP, Bever TG: Peripheral & cerebral asymmetries in the rat. *Science* 1997;278:44:483-486.

Abstract: Rats learn a novel foraging pattern better with their right-side whiskers than with their left-side whiskers. They also learn better with the left cerebral hemisphere than with the right hemisphere. Rotating an already learned maze relative to the external environment most strongly reduces right-whisker performance; starting an already learned maze at a different location most strongly reduces left-whisker performance. These results suggest that the right-periphery-left-hemisphere system accesses a map-like representation of the foraging problem, whereas the left-periphery-right-hemisphere system accesses a rote path. Thus, in humans, functional asymmetries in rats can be elicited by both peripheral and cortical manipulation, and each hemisphere makes qualitatively distinct contributions to a complex natural behavior.



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