

ASCAP

Volume 12, No. 3 (Cumulative #136)

March, 1999

"In fact, the human brain is not so very large. Weighing in at about 1.3 kg, our brains are dwarfed by those of some other mammals. For example, the brains of several baleen whale species and the toothed sperm whale weigh between 5 and 8 kg, and those of the African and Indian elephants also weigh more than 5 kg.

Paul H. Harvey & John R. Krebs¹

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Across-Species Comparisons and Psychopathology (ASCAP) Society Executive Council:

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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 research endeavors, etc.

The ASCAP Newsletter is a function of the ASCAP Society.

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World Psychiatric Association

http://www.wpanet.org
for the August, 1999 meeting contact:
www.wpa-hamburg.de

Some of us will be staying at
Hotel Holiday Inn, Kieler Strasse 333
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fax 040 54740-100

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 ...

Meeting Announcement

Register for MacLean Festschrift Meeting July 16-17, 1999:

Plans are going very well and we expect this special meeting of the ASCAP Society to be historic. Details follow below. Please feel cordially invited to attend.

Registration form is last page of this ASCAP issue.

Location will be the Back Bay Hilton in Boston. Reservations available at 800 874-0663 or 617 236-1100. Special rates have been arranged for The ASCAP Group" -\$185/night for single or double bed plus tax. **Please make your reservations for the nights of July 15 & 16 (for the meetings Friday, July 16 & Saturday, July 17) as quickly as possible, latest June 15.** Make sure that you identify your group affiliation as ASCAP when you make your reservation. The group rates may hold for July 17 should you desire.

Registration fee is \$75. For personal reasons (we're making an interstate move on June 1-6, 1999) we would appreciate your registration to arrive before May 28, 1999. Notify us of your intent via email if you have it. Use application form this issue. You may use check or credit card made out to UTMB. We will still be using the UTMB account because Dr. Jeff Matthews has agreed to be our faculty representative.

Funding and Publication Plans:

Pfizer invited an application for funding to support the speakers and meeting arrangements (thanks to Vassilis Koliatsos). This was sent but word hasn't come back yet as this goes to press. Some speakers have notified us of hardship should financial backing be not available so the speaker list might shorten should funding not come through. We should know next issue about funding.

Abstracts for the meeting will occupy the July issue of *The ASCAP Newsletter*. This will be used the program guide. We have submitted a prospectus for publication of the collected papers to Greenwood-Praeger. In addition, the *Journal of Affective Disorders* has indicated they will devote a special issue to those

General goal. The meeting will review the impact of MacLean's work for psychiatry and many other fields as well. He has been a dominating figure in the neuro-science of behavior in mid-twentieth century. In his mid-eighties he continues to write and otherwise be productive, although he has just now retired from the National Institute of Mental Health where for many years he led the Laboratory of Brain Evolution and Behavior.

In his characteristic desire to avoid fanfare, he graciously told us that his family involvement and book writing schedule preclude his own

attending the meeting. **Specific objectives.** Meeting attendees will, as a result of this symposium, be able to:

1. Outline the relevance of MacLean's research and data for psychiatry, child psychiatry, politics, ethology, and research on attention & emotions,
2. Assess MacLean's theory with respect to its philosophical underpinnings, issues of reification, and new information from molecular biology including the genome project,
3. Note the arguments of certain critical reviews of MacLean along with data showing that they are suspect, and
4. Furnish information on how his perspective augments our understanding of affective disorders, violence, and hyperactivity syndromes.

The **schedule and tentative list of speakers** (each speaker will present for 25 minutes with 5 minutes at the end for questions from the audience; these will be noted for book inclusion):

Session I. Fri 7/16/99 1st am session: Neuroscience Perspective

1. C.U.M. Smith: Comparative Molecular Biology in Evolutionary Perspective
2. Gerald A. Cory: Inaccurate Reviews of Paul D. MacLean's 1990 Triune Book
3. Vassilis Koliatsos: Appraisal of MacLean's Efforts for Neuroscience

- Session II. Fri 7/16/99 2nd am
session: Philosophy,
History, & Theory
4. Seymour Itzkoff: Philosophical Assessment of Triune Theory
 5. Ernest Barratt: Historical Perspectives on MacLean's Theory
 6. Daniel Levine: Neural Nets, Consciousness and Triune Theory

- Session III. Fri 7/16/99 1st pm
session: Attention, Behavior & Emotions
7. Allan Mirsky: The Triune Brain in Relation to the Functional Analysis of Attention
 8. Neil Greenberg: The Beast Within: Human Implications of the Reptilian Brain
 9. Glenn Weisfeld: Human Emotions and Their Ethological Roots: Darwin & MacLean

- Session IV. Fri 7/16/99 2nd pm
session: Children, Aggression, & Violence
10. James C. Hams: Neuroscience for Child Psychiatrists
 11. Anneliese Pontius: Neuroethology Exemplified by Limbic Seizures with Motiveless Homicide
 12. Daniel Matthews: Practical Results in the Treatment of Violent Youth from Assessing Limbic System Pathophysiology

- Session V. Sat 7/17/99 1st am
session: Triune Theory & Depression
13. John S. Price: The Triune Brain & Depression
 14. Hagop Akiskal: Evolutionary

Significance of Hyperthymic & Cyclothymic Temperaments

15. Leon Sloman: Involuntary Subordinate Strategy as Backdrop for Depression

Session VI. Sat 7/17/99 2nd am
session: Triune Theory, Mania & Hyperactivity

16. Daniel R. Wilson: Mania and Evolutionary Epidemiology
17. James Brody: Mania and Hyperactivity as Evolutionary Determined Alpha States
18. Alan Swann: Mania as a Basic Plan for Dominance and Leadership

Session VI. Sat 7/17/99 1st pm
session: Politics, Pathology & Communication

19. Roger Masters: Brain Organization Impacts Human Politics
20. Kent Bailey: Upshifting and Downshifting the Triune Brain: Role in Individual and Social Pathology
21. Russell Gardner, Jr: Communicational, Brain and Molecular Basic Plans

Session VII. Sat 7/17/99 2nd pm
session: [Award Talk] & Concluding Words

22. Aaron T. Beck Award Speaker (if the Boston venue is chosen by the essay context winner)

23. Karl Pribram: The Last Word: MacLean's Work and the Informational Sciences

Additional chapters for the book that do not stem directly from presentations (because authors could not attend) will include:

Detlef Ploog: Psychopathology in

the Light of Neuroethology. Steven Peterson: The Theory of Paul MacLean as it Illuminates the Problem of Reification in Social and Political Thinking

AND immediately afterwards, consider registering for the Cape Cod course that Jim Brody is organizing, as follows,

Meeting Announcement

Clinical Sociobiology: Darwinian Feelings & Values

Course in Annual AECOM
Cape Cod Institute
July 19-23, 1999

This is one of 26 courses in the 20th Cape Cod Institute put on by Department of Psychiatry of Albert Einstein College of Medicine. The Faculty include: James Brody (organizer & leader), John Price, John Fentress, Russell Gardner (with guest veterinarian expert in animal behavior from the UK, Robin Walker).

Description: There is value in knowing about evolution beyond its nastiness. Cooperation and competition are a crystal structure but we often focus more on harm while taking nurturance for granted. Bad news is on the front page, the good stuff in the back sections and sale papers. Every client or patient makes judgments about bad and good, judgments attached to his/her emotional tools. Feelings, thoughts, and values

are tightly linked; it helps to understand their biological roots.

Evolutionary findings describe events in our lives, marriages, and families and in principles that can be used responsibly with clients. They outline a map for constructive living and for intervening in anxiety and depression, abuse, violence and infidelity. These principles also suggest the circumstances under which we are most likely to betray others or to abuse children or mates. Confidence for our clients also grows with the anecdotes that we offer as seasoned teachers and therapists.

This symposium elucidates the clinical implications of evolutionary psychology, designed for those new to the subject as well as old hands. Participants will receive a 300-page course manual, pre-publication copies of Dylan Evans' introduction to evolution (if available) and a Charles and William T-shirt. Following the morning sessions on Monday through Thursday there will be optional follow-up small group discussions and three optional evening sessions will be offered on diagnostics, complexity theory and genetics. The daily sessions (subject to change) follow:

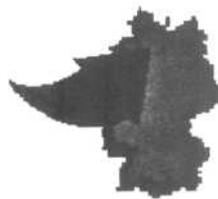
Monday - Natural selection and human psychological adaptations: domain specificity, cheater detectors, emo-

tional and moral tools, retargeting the idea of "mismatch" Tuesday - Social behavior as expression of adaptations: evolutionary foundations for a basic science of psychology and psychiatry, story-telling and functions of values, gossip, and group monitoring. Wednesday - Hierarchy regulation: the origins, expressions and interventions anxiety, mood and personality disorders.

Thursday - Marriage and child-rearing: male/female conflicts of interest and power balances, children (who's really in charge), abuse, reconciling what is good with what seems natural. Friday - Genes as conversationalists with our settings: tuning genes, finding places to be ourselves.

Meeting Announcement

And let us not forget - some of us going to Europe this summer for the other ASCAP meeting.



Reiterated Call for Papers and Notification Second ASCAP Meeting of 1999

**Theme: Ethology and Practice
in the Clinical Human Sciences
Hamburg, Germany
August 6, 1999**

Our meeting will occur just before the World Psychiatric Association Meeting. Mark Erickson from Alaska, as current president, has named the theme and will preside, presenting the first paper of the day as is now our tradition. Ivor Jones, animal model expert and incoming president from Tasmania, will end the day with his talk.

We need your abstracts by June 15, 1999. Please include name, title, affiliations, address including email/fax, and an abstract of 350 words. Send snail mail/email/fax to Russell Gardner, using the address of 921 Blume Drive, Galveston, TX 77554 if you send before June 1 or 214 DuRose Terrace, Madison, WI 53705 after June 1.

The email address has changed to rgj999@yahoo.com, or rgj999@looksmart.com, or russellgardnerjr@hotmail.com (All three addresses will be checked regularly)

The hotel at which we are staying and which we hope has a meeting room for us to use is **Hotel Holiday Inn Kieler Strasse 333 22325 Hamburg tele 040 54740-0 fax 040 54740-100**

Aaron T. Beck ASCAP

Dont overlook the competition for the fifth annual Aaron T. Beck ASCAP Award. This \$1000 award will go to the author of the best paper on a topic of relevance to the ASCAP mission submitted by a student, or new investigator (within two years of award of degree, or end of residency training if M.D.).

The award is intended in part to support the winner's trip to one of the 1999ASCAP-sponsored meetings: the Festschrift for Paul MacLean in Boston, Massachusetts, USA, (July 16-17), or Hamburg, Germany (August 6). The winner will receive a plaque at and will orally present the winning paper. (Applicants should please indicate which meeting venue would be his/her choice).

All or part of the paper will be published in *The ASCAP Newsletter*. Applicants should send three copies of the paper to: Linda Mealey, Chairperson, ASCAP Beck Award Committee, Psychology Department, College of St. Benedict, St. Joseph, MN 56374. To ensure full consideration, applications should be postmarked by May 30, 1999. Also it can be e-mailed to mealey@csbsju.edu, or sent by FAX to her at 1 (320) 363-5582. See announcement of the competition in the Feb issue of *ASCAP* for more details.

Profit from ASCAP

Sorry for subscription delay. Kept thinking I had already renewed!

I profit much from ASCAP.

Lionel Tiger
FC2L15@prodigy.com

New Book Announcement

The Decline of Males

by Lionel Tiger

The author of the renowned *Men in Groups*, which introduced the concept of "male bonding," returns to male behavior and explains why the sexual and family norms of American society have changed so dramatically over the last few decades.

This distinguished anthropologist and author offers a unique biological perspective on major questions of the age that have thwarted sociological, economic and political explanation:

Why are one-third of the babies of the industrialized world born to single mothers? Why has there been an increase in both legal and illegal abortions - even though contraception is vastly improved and widely available? Why are so many men reluctant to support their families? Why do so many women want to - and have to - work?

Most experts see the cause in social forces: politics, economics or morality. *The Decline in Males* offers arresting evidence that the real issue is reproduction, a biological process. Tiger argues

that the most basic cause of these changes is the spread of effective contraception - which, controlled by women, gives them the sole power to decide to bear children - or not - independent of men's desires and even of their knowledge. Removed from the process of reproduction, men have begun to feel obsolete, resulting in their unprecedented withdrawal from family systems.

Challenging the most basic assumptions about male-female relationships, *The Decline in Males* provides valuable lessons for mothers to teach their sons -and their daughters - as we enter the twenty-first century. Offering a guide to our evolutionary past and our revolutionary present, Tiger provides the understanding of our biological roots that we need in order to mold the futures we desire.

Dr. Lionel Tiger is The Charles Darwin Professor of Anthropology at Rutgers University. The author of several books, including *The Imperial Animal* (with Robin Fox), *Optimism: the Biology of Hope*, *The Pursuit of Pleasure*, and *Men in Groups*, he lives in NYC.

256 pages, U.S. \$23, Can \$33. New York, N.Y.: Golden Books. Publication date: April, 1999

Editor's remark: In addition, I found that Dr Tiger shows up in the Summer, 1998, issue of *Perspectives in Biology and Medicine*. There he wrote an article entitled "My life in the human nature wars." (1998;

41:468-482)

I would find it hard not to recommend this engaging well written history of the "bio-social view" and "biogrammar." In sociophysiology and evolutionary psychology, we see too little reference to his pioneering work. He & Robin Fox wrote *The Imperial Animal* well before Wilson's *Sociobiology*. (Tiger L, Fox R: *The Imperial Animal*. NY: Henry Holt, 1971, 1989). Tiger can truthfully say, however, 'Today it is clear that the biological account has left its mark on the intellectual landscape" and he must be given due credit!

New Book Announcement

The Interactional Nature of Depression: Advances in Interpersonal Approaches

Edited by Thomas Joiner & James C. Coyne

Even when theorists, researchers, and therapists themselves forget, depressed people will say that their interpersonal life matters: relationships perceived as good buffer them from depression and those perceived as bad contribute to and maintain depression. Depressed individuals frequently know that they are in a "Catch-22" dilemma of needing the very people whom their symptoms disaffect. Processes such as "excessive reassurance seeking," and "negative feedback seeking" may influence depressive cycles. Depressed people may also realize therapy needs to focus on improving the nature of their relationships. That depressed people are often correct in these perceptions that is the lasting and

most profound contribution of the interpersonal approach to understanding the antecedents, maintenance, and treatment of depression.

Theory that depression is an *interactional style* now influences the field, producing several lines of empirical study and therapeutic interaction. *The Interactional Nature of Depression* claims a central place for this tradition of thought and science in the collection of fundamental views on depression. The book brings together interpersonal, cognitive, stress and coping, developmental, and social psychology perspectives for more a complex and comprehensive approach to depression theory and research. In the book's post-script, co-editor James C. Coyne offers caveats regarding the limitations of certain lines of research. Moreover, he calls for alternative formats and therapeutic strategies for intervening directly in the lives of depressed individuals, enlisting the help of those in the individual's environment who are willing.

Thomas Joiner is First Vice President of The ASCAP Society. With Dr. Coyne & Jan Blalock, he authored the first chapter, "On the Interpersonal Nature of Depression: Overview & Synthesis." Another chapter by Gardner & Price is titled "Sociophysiology & Depression."

Hardcover, 440 pages. American Psychological Association Affiliates \$34.95; list \$39.95. Contact APA Order Dept 1 -800-347-2721; in Washington D.C. 202-336-5510

Reply to Kimberly Cline on Evolution of Depression

Exiles from Eden: Psychotherapy From An Evolutionary Perspective, by Kalman Glantz and John Pearce (NY: Norton, 1989) does not have a theory of depression that I can recall. Our focus is on mismatch of evolved psychological mechanism for current problems, and pathologies of reciprocity—a topic not generally directly taken up. Paul Thompson *etal* have proposed that major depression is an adaptation to force those invested in one to get them out of a failing niche. I think it is obvious/plausible that depression is an integrating limbic output triggered by depleted resources.

Depressed, one assesses the resources as even worst than they are (glass is half empty). Euthymic, one assesses resources better than they are (half full). This pretty much assumes an environment in which feeding niches changed frequently—which seems reasonable. Intermittent reinforcement is a mechanism for mobilizing extra effort when resources are just moderately depleted.

You dont need motivation when the fruit is falling off the trees, and you are better off getting discouraged pretty fast when the fruit is all gone. In general, foraging mechanisms are very sophisticated (for the environment in which they evolved). See the animal behavior literature.

John Pearce
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Hitler's charisma

I grew up in an German immigrant area in rural Michigan. High school was very German-focused with this the only foreign language taught; German history was taught along with American history. My history teacher shows us films of Hitler's speeches - in German! Even at 15, I was struck by how charismatic Hitler was. I did not understand a word he said (my teenage rebellion consisted of refusing to take German, especially being Irish Catholic. I regret this decision now). But his energy, his passion, his enthusiasm slashed through the language barrier. I found myself getting caught up in whatever he said, even though I did not understand the content.

Since then, I have never had any doubts to why the German people followed Hitler like sheep. Charisma is a very, very powerful attribute.

Kelly C. Kissane
kckissan@wam.umd.edu

Australian reply

Yes it is, and I think it was the cement that helped hold tribes, of a few hundred people together. However tribes today, are in their millions, causing the this emotional system to burst at its seams. What matters more today, I think, is the quality of the dogma behind the Charisma.

John Edser
edser@atinet.com.au

Alaskan reply

There's no questioning the power of charisma, and it seems to me to be as viable as ever. True, the percentage of people today who actually will follow a charismatic leader to the grave—due to the burgeoning world population, diversity and depth of human knowledge, etc.—might be much smaller today than it once was, but impact of such people still is obvious. Religious cults and their activities of late are obvious examples.

Kelly's example of charisma over language reminded me of a time I watched a French Canadian comedian perform, in Canada, in French. I don't speak French, and understand very little of the language, but that guy had us English-speakers in stitches. I can't remember an entertainer in my lifetime who made me laugh so hard. I had no idea what he was talking about, but he had us in his grip.

Scott E. Antes
ftsea@aurora.alaska.edu

Meeting Announcement

Evolutionary Psychology lectures in New York City

Dori LeCroy (DoriLeCroy@aol.com) tells us that The City University of New York's Biopsychology Doctoral Program is presenting a colloquium series entitled EVOLUTIONARY PERSPECTIVES ON

HUMAN REPRODUCTIVE BEHAVIOR.

The sessions are held at: Hunter College School of Social Work 129 E. 79th St. The talks are scheduled from 2:30 to 5:00 on selected Wednesdays. There will be two speakers on each day. Each speaker is a prominent Darwinian theorist and researcher. The sessions are open to the public at no charge.

March 10
David Buss "From Vigilance to Violence: The Strategies of Human Mating"
Stephen Gangestad "The Evolution of Human Female Sexuality: An Evolutionary Perspective"

March 24
Sarah Blaffer Hrdy "The Optimal Number of Fathers in a Variable World Occupied by Cads and Dads"
Frans de Waal "Bonobo or not Bonobo: Why Models of Human Evolution Cannot Continue to Ignore Our Sexiest Relative"

April 14
Jerome Barkow "Do Extraterrestrials Have Sex (or Intelligence)?"
Geoffrey Miller "Courting Minds: How Mate Choice Shaped Human Nature"

May 5
Dennis Krebs "The Evolution of Moral Dispositions in the Human Species"
David Haig "Genomic Imprinting and the Divided Self"

Table of Genetic Resemblances

Is there a table of cross-species genetic relationship to which one can refer quickly and easily? (Scott Antes)

I don't have a table for DNA relationships, but I have one for cytochrome C amino acid substitutions (which correlate very well with DNA substitutions). Since the cytochrome C molecule has 104 amino acids, the figures given below are very close to the percentage figures.

NUMBER OF IDENTICAL AMINO ACIDS IN CYTOCHROME C

Human - Chimpanzee	104
Human - Rhesus monkey	103
Human - Dog	91
Human - Horse	87
Human - Donkey	88
Human - Pig	91
Human - Rabbit	92
Human - Kangaroo	92
Human - Duck	87
Human - Chicken	86
Human - Turtle	85
Human - Rattlesnake	84
Human - Tuna	73
Human - Moth	68
Human - Candida (yeast)	38

Peter Frost

<http://www.globetrotter.net/gt/users/pfrost>

Of Donkey and Man

A man (or a woman) is composed of flesh, bone, tooth and sinew. He must have DNA capable of creating these materials. He has a skel-

eton with a particular configuration, a circulatory system, lungs, liver, two eyes, a brain.

A donkey is the same in all these respects. A man is a donkey, only a slightly different shape, and with various refinements to digestion, and instinct. I would expect that the DNA which codes for a donkey to be mostly the same as that which codes for a man.

Further, given that donkeys and men share ancestry, I would also expect that a lot of the DNA would be shared, but much also would be irrelevant.

Imagine that an ancestor of both donkeys and man had some organ which neither donkeys nor men need, feathers perhaps. The DNA which coded for the feathers would still be passed on, but not activated. Once the feathers were no longer made, there would be no selective pressure to copy accurately the sequence which coded for an organ which was no longer grown because those genes were not switched on. Over time, this sequence of DNA would change to gobbledygook, and this gobbledygook would account for a significant proportion of the difference between the DNA sequences of donkeys and men.

Also, since DNA sequences are a sort of language, the amount of difference between one sequence and another is a bad way to measure the actual difference.

Take these two sentences:

Thou shalt never commit adultery.

Thou shalt often commit adultery.

These sentences both involve 33 characters, of which all but four are the same characters and in the same position. Are then these two sentences near enough the same? Measured in terms of the character sequence, they are nearly the same. Measured in terms of meaning, they are opposites.

The DNA sequence for a part of a donkey may be similarly near identical, but in effect so very different that the similarity of the sequences is near enough an irrelevance.

Nikolas Lloyd

Nikolas.Lloyd@NCL.AC.UK

Two Poems

Pity

Pity is a black crow
swooped down from its pine perch
outside
my window,
scooping up sins of omission
as easily as retrieving
dropped popped corn.

A Murder of Crows

My murder of crows is refuging in
the pines
their nefarious deeds
hidden in whiteness of
snow

Like thieves in the morning,
they sleep content

Well kept secrets of devilment
tucked under ebony wings. By
Lorraine Rice

ARTICLE:

by Donald Klein & Russell Gardner

Criticism of *The ASCAP Newsletter* & Reply by Editor

Criticism

I have renewed my suscription to ASCAP at your kind urging. My problem with [the] journal is that it's very uneven. Even the good articles fall short of any attempt to develop hypothesis-testing. It reminds me uncomfortably of a lot of the early psychoanalytic stuff where all sorts of wild explanations were proffered that were accepted fortheir literary value. I don't know if that can be tightened up or even if it is premature to try to tighten it up.

Donald F. Klein
donaldk737@aol.com

Reply

I first heard Donald Klein with excitement in the early 1970s as he presented his theory of anxiety disorder based on two possible components: (1) a *de novo* panic experience that characterizes panic disorder, and (2) learned anxiety stemming from such aversive panics for experienced them before. This testable theory has had great influence (as in *DSM*). Dr. Klein must be credited with an emphasis on pathogenesis in the form of a heuristically valuable idea. Indeed, I hope that he provide us an update on its current status more than twenty-five years later. Moreover, I am sympathetic with his critical view of psychoanalysis, a clinical discipline that did not have embedded within it a method of testing hypotheses in usual scientific ways. Dr. Klein was at the vanguard of the counter-psychoanalytic movement in American psychiatry, but in contrast to the Washington University group under Eli Robins, I haven't felt Dr. Klein to be vituperative. Rather, he attends seriously to pathogenesis and to the developing science to underlie psychiatry best.

Thus, despite the above criticism, I feel Donald Klein to be sympathetic to our mission (note his "I dont know if that can be tightened up or even if it is premature..."). But he illustrates that we haven't explained it well enough yet. So I say a few words here and

suggest that others also respond to his valid, thoughtful critique. We should feel most grateful for this senior, respected and influential psychiatrist remaining amongst our number.

First I have the following implicit model in my head for how to approach the difficult question of what is psychiatry's basic science: when a problem exists, one should first brainstorm and try to break up usual concretized approaches that have become ruts constraining creativity. I value the literary contributions because artists train themselves to think differently and we need that now. After brainstorming, the re-assembled and reformulated new thoughts then allow a retightened new hypothesis formation and testing (Dr. Klein wants more of that, hopes we're at that stage). Science-activity represents disciplined thinking in which we are only finally persuaded when an alternative hypothesis is demonstrated false by data collection. Best research hinges on rigorous tests.

So Dr. Klein's complimentary misnomer - calling this newsletter a journal - has significance with respect to where we position ourselves in these efforts. Journals feature attention to rigorous conclusions and use peer review to effect that. That would be premature here. I have been told that "of course" the newsletter will progress to a journal. I've personally resisted as too little consensus yet exists that a framework basic science is needed (colleagues now don't see the point, like Claude Bernard's peers who wished him to stop wasting time in the lab and take his proper place in the clinic). We have brain-stormed too little as yet!

Part of the stall is the tremendous success of pharmaceutical psychiatry. The effectiveness of the drugs we use and the power of the large drug companies to dominate the scene has meant that psychiatric illness takes on the quality of "medication-deficiency syndromes." The doers of pharmaceutical research and the marketers for the results are not interested in mechanisms aside from certain specified levels of

investigation that simplify the analysis to serotonin and other neurotransmitters on the one hand and patient syndromic response on other hand. Any further top-down bottom-up analyses might interfere.

Consider the placebo effect (meaning that the person responds to "please" the giver of the medicine) that obfuscates current drug company research. Since some investigators regularly report very high placebo rates, some clinical trials inform little about new drugs. The placebo response for the companies is a hazard and a liability, not a phenomenon important to study in its own right. But of course, in a framework basic science of sociophysiology, such phenomena would be at the very center of thought and investigation.

I feel ASCAP's effort is completely different from the early psychoanalytic efforts (though informed by its difficulties). There, Freud made a twentieth century departure from top-down bottom-up research (integrating the brain and behavior/mentation). He thought in terms of mental mechanisms in a top-up manner only (though he had been a published neurologist and used metaphors popular in nineteenth century neurology). Skeptical, he felt too little was known of the brain to try integration and left us with a legacy of a persistently disembodied psyche and untestable hypotheses He did not consider his thinking brainstorming preparatory to hypothesis-testing, data-based research, but rather science itself, his patients revealing as much fact as one needs to know.

A century later we know great quantities about the brain, the genome and behavior. Indeed, to counter a little Don Klein's observations about a disinterest in hypotheses, let me point out the Abstracts-Extracts section of the newsletter where quotes reflect hypothesis-testing and data-gathering efforts, and -1 hope -the excitement emanating from these disciplines providing foundation data for an emerging basic science that needs to be juxtaposed to what our patients and artists have to tell us.

Also note the following article this issue by Dylan Evans. This already well published psychologist is in a Ph.D. program with his mentor Nicholas Humphery. (NH is the psychologist who first forwarded an idea

that Robin Dunbar later provided data for that humans have larger brains because they have more extensive and warmer social contacts).

Dylan takes on the social rank hierarchy hypothesis of depression and considers it thoughtfully and critically. Named dually for Dylan Thomas and Bob Dylan, the name tells his age; he is of the younger generation now focusing on data-producing questions and indeed commencing Klein's "tightening up" in the field.

In developing his argument, Dylan suggests that "the most well-known evolutionary hypothesis about a mood disorder is the social competition hypothesis of depression." "Most well-known" was fascinating to read, as it is not at well known to the general psychiatrist, fascinating because this illustrates the adage of a Max Planck head quote used in early ASCAP issues over a decade ago. It held that one never persuades the older generation with a new idea, but the next generation that comes along *assumes* its possible viability. This is not to disavow or overtook the importance of hypothesis-testing and data generation but to highlight that such testing must be done in a context of shared beliefs that admits the possibility of an idea-set. I feel confident that twentieth-century dismissal of the possible basic plan nature of social rank hypotheses will give way to their serious testing in the twenty-first century. Not that I consider Dylan's the last word: his term "module" is as top-up as Freud's model. This is one of the reasons that I view skeptically "evolutionary psychology." The psyche here remains as distant from the brain as psychoanalysis's.

So I feel we're obliged to you, Donald Klein, for your continuing support and participation in the ASCAP Society and in your continued reading of its newsletter. We treasure your participation even though these loose, free-wheeling, brain-storming, sometimes playful activities may raise problems for your careful mind. But I hope that this response interests you and others like you and that perhaps you might respond to it. What guidance do you have for the efforts of the next generation of scholars and researchers? Might you spur on a younger colleague to write an essay for the Aaron T. Beck award that could earn him or her support for a trip to either Boston or Hamburg?

The Social Competition Hypothesis of Depression

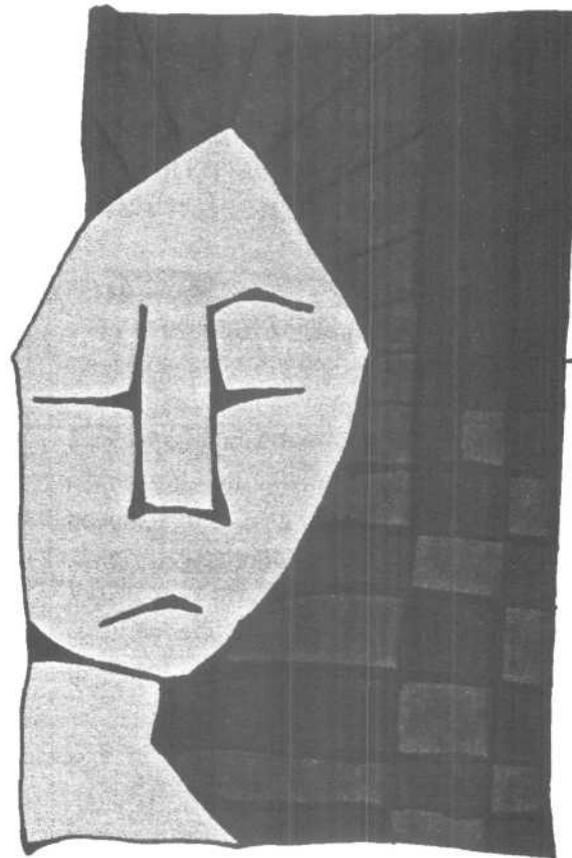
Ever since John Price first put forward the social competition hypothesis of depression,¹ mood disorders have constituted one of the most extensively debated areas in evolutionary psychopathology. The main issue at stake in this debate is the question of whether depression is an adaptation or not.

It is worth noting at this point that the very terms in which this question is couched are misleading. Depression is a set of symptoms (observable behaviours), and according to the tenets of evolutionary psychology, behaviours themselves are never adaptations. Behaviours can be *adaptive*, in the sense of contributing to reproductive success, but they are not themselves *adaptations*. Adaptations are not actions or processes but structures -morphological or cognitive -that have been selected for in virtue of their capacity to produce adaptive effects. Morphological structures that count as adaptations include bodily organs, cells, tissues, etc. Cognitive structures that count as adaptations include Darwinian modules and any non-proprietary stores of information that may have been selected for.

The question should therefore be re-phrased in terms of the psychological mechanisms (modules) that cause the cluster of symptoms known as depression. The key question is not whether the symptoms themselves are adaptive today, but whether the mechanisms that cause these symptoms were selected for in virtue of their capacity to cause these symptoms. In other words, what is the proper function of the Darwinian modules that cause the symptoms of depression? Is causing these symptoms the proper function of the module(s) concerned, or is this causal capacity a by-product of modules that were selected for in virtue of other capacities?

Phrasing the question in this way makes it more conceptually consistent with evolutionary psychology, but it also exposes more clearly the difficulty of supplying an answer. Questions about proper functions are historical questions, and can only be answered by identifying the selective pressures that operated during distant periods

of time. Identifying the selective pressures that formed gross morphological features such as feathers and snail-banding patterns is hard enough, but identifying those responsible for the formation of cognitive structures (or, what amounts to the same thing, microscopic morphological structures in the brain) is even harder. Some have even gone so far as to argue that the task is impossible,² but this is to neglect the growing body of evidence from paleo-archaeology, primatology and anthropology that is shedding increasing light on the ways our ancestors lived. Nevertheless, it is worth keeping in mind the tentative nature of statements about the selective pressures responsible for human cognitive capacities.



Asking about the function of the modules associated with depression is equivalent to asking which modules are associated with depression, because modules are

defined by their function. So we cannot separate the enquiry into two stages - a more tractable, empirical stage, in which we first identify the modules associated with depression, and a more speculative, theoretical stage, in which attempt to identify the selective pressures that shaped the modules - as we might do with gross morphological adaptations. On the contrary, the enquiry is theoretical through and through from the very beginning.

The most well-known evolutionary hypothesis about a mood disorder is the social competition hypothesis of depression. The idea was first stated explicitly by the British psychiatrist John Price,¹ and has since been developed by others, including Leon Sloman,³ Russell Gardner,⁴ and Paul Gilbert.⁵ The hypothesis states that depression is an adaptation whose function is to inhibit aggressive behaviour to rivals and superiors when one's status is low.¹ Translated into the language of modules, the hypothesis is that 'human beings share with their more primitive ancestors a mechanism for yielding in competitive situations',⁶ and that this module plays a key role in generating all the major symptoms of depression.

Many animals display submission cues to a conspecific aggressor who appears bigger and stronger. For example, dogs bare their throats when attacked by a stronger dog, and some primates show their anus. These submission cues usually prompt the aggressor to terminate the attack. The social competition hypothesis views depression in humans as homologous with these 'involuntary yielding strategies'. It postulates a yielding module that is triggered when we believe ourselves to be out competed and that activates symptoms of depression as submission signals.

Some support for this homology is provided by recent studies of dominance hierarchies in various primate species. These studies have uncovered many physiological and behavioural data that can be interpreted as elements in a yielding strategy. Raleigh *et. al.* found that low-ranking vervet monkeys have serotonin levels that are half those of the alpha male.⁷ Sapolsky *et. al.* found that social subordination in yellow baboons was associated with hypercortisolism.⁸ The fact that low serotonin levels and hypercortisolism are

also associated with depression in humans lends strength to the idea that human depression is related to the same mechanism that mediates social subordination in other primates.

If the social competition hypothesis of depression is correct, how should depression be classified according to Murphy and Stich's taxonomy of E-M problems?⁷ It would not be classed as a 'module malfunction', as the postulated yielding module is not malfunctioning when it produces the symptoms of depression. On the contrary, that is precisely the function of the yielding module. Could it be classed as 'problematic input'? This would be the case if the yielding module were downstream from a module that was malfunctioning, or if the yielding module were receiving mistaken information from some non-proprietary store. Neither of these possibilities is applicable to the social competition hypothesis.

The only remaining category in Murphy and Stich's taxonomy is that of 'environmental mismatch', and this does seem to fit the social competition hypothesis. The idea is that our hunter-gatherer ancestors lived in relatively small groups - Dunbar estimates the average group size of early *Homo sapiens* at around 150- in which it was quite likely that every individual could excel in some area.⁹ Every individual, that is, would be able to find a unique social niche in which their particular mix of abilities would grant them a competitive advantage. One person might be the best animal tracker, another might be particularly good at finding the way home, and so on. Being the best at something conferred status, and high status increased reproductive success. In such an environment, it would be vital to find one's own niche rather than remain in someone else's. Thus, a mechanism that makes you lose interest in your activities when they result in low status would be a highly adaptive way of getting you to switch strategies and seek another niche in which you would do better.

The mismatch with today's environment should be clear. In modern societies, your chances of excelling at anything are remote. Not only do we come into direct competition with many more people when taking exams and applying for jobs than our ancestors ever did when hunting and gathering, but the mass media put us in imagined competition with potentially the whole human popu-

lation. If we have a yielding module that is triggered when we believe ourselves to be outcompeted, then that module will go into overdrive in the modern world. This is a case of environmental mismatch because the depressive symptoms that result are no longer adaptive in a world in which there is no other niche one could fill in which one would compete significantly better than in the present one.

The foregoing account makes clear that the social competition hypothesis does not view the symptoms of depression merely in terms of signals. In line with most evolutionary accounts of mood and emotion, the social competition hypothesis also recognises that depression has an important motivational function. One might even distinguish between those symptoms of depression that perform this 'internal' function and those that perform the 'external' function of signalling submission. On the one hand, the classic 'psychological' symptoms of depression - which include depressed mood, loss of interest, hypersomnia, fatigue, feelings of worthlessness and thoughts of death - could plausibly be viewed as providing the motivation to give up competing in the current niches and look for another. On the other hand, the 'somatic' symptoms - such as weight loss, psychomotor retardation, and the bodily postures and facial expressions associated with depression - could be interpreted as homologues of the submission cues exhibited by other social animals. In the case of humans, these submission cues would function as signals to other, more dominant humans that the depressed individual does not intend to continue to compete in this particular niche. By signaling the intention to look for another niche, the submission cues indicate that the depressed individual does not pose a threat to the established dominance hierarchy in the current niche.

These considerations suggest that the mechanism postulated by the social competition hypothesis should not be characterised merely as a 'yielding module', since its function is more than merely that of signalling submission. Perhaps it would be more appropriate to refer to the hypothetical module as a strategy-switching module, or a social-competition module, since its function is to make the individual find an alternative niche in which he or she can compete more success-

fully. The module produces both internal motivational effects and external signals because this whole suite of effects assisted the individual in finding a better niche in ancestral environments. However, we regard these motivations and signals as 'symptoms' of a 'disorder' today, because in the modern world they no longer have the same adaptive effect. For example, when the realisation that one is outcompeted in the current niche is combined with the awareness that there is no other niche in which one could do better, the depressive symptoms persist indefinitely, leading to an enduring sense of 'learned helplessness'.⁹ This is almost certainly mal-adaptive; far from helping the person to find another niche, the state of learned helplessness discourages them from doing anything to alter their situation. In the current environment, therefore, the social competition module may produce harmful behaviour even when it is working just the way it was designed to work.

The social competition hypothesis thus identifies depression as a peculiarly modern scourge. The hypothesis is therefore consistent with recent data which suggest that rates of depression have increased steadily in the past few decades, doubling every ten years in many industrial countries.¹² If the role of the mass-media in transforming the world population into a single competitive group is as important as the social competition hypothesis suggests, then the recent increase in rates of depression could be linked to the rise in television ownership that is a feature of modern industrial societies.¹¹ (page 220-1)

However, these considerations also point to two obvious problems with the social competition hypothesis of depression. On the one hand, the hypothesis seems to predict that almost everyone in modern societies should be depressed. On the other hand, it also seems to predict that the few people who do exceptionally well in their niche - world class pop-stars and film-stars, leading politicians, and so on - should never be depressed. This is problematic because neither of these predictions is true. Levels of depression are indeed high - the lifetime risk is between 10 and 25 per cent for women and between 5 and 12 per cent for men¹³ - but these figures are still a lot lower than the social competition hypothesis would lead one to expect. Conversely, it is not hard to find cases of highly successful people becoming de-

pressed. However, these counter-examples may not constitute the decisive refutations of the social competition hypothesis that they appear to be. Most adaptations - even those that have been fixed by natural selection long ago - show some degree of heritable variation in one or more parameters. It is highly likely that a putative social comparison module would exhibit variation in the degree to which it is sensitive to the cues indicating low status.⁹ These individual differences might account for many of the cases of low-status individuals without depression and for the few cases of high-status depressives.

Other problems with the social competition hypothesis are perhaps more fatal to the theory. Among these is the fact that 'many depressions go away only after a person finally gives up some long-sought goal and turns his or her energies in another direction'.¹⁴ (p.217) At first blush, this might seem to constitute evidence in favour of the social competition hypothesis; this is how Nesse and Williams interpret this fact. However, a little reflection reveals that the fact actually militates *against* the social competition hypothesis. According to the social competition hypothesis, the function of depression is to assist the individual in switching to a more profitable social niche. A key part of the hypothesis is that in today's different social environment there will often be no such thing as a more profitable social niche, so that in the modern world changing one's direction in life should not cause the depression to remit. Yet, according to Nesse and Williams, it often does.^ψ

Another problem with the social competition hypothesis is that it implies that all decisions to abandon unrealisable goals are mediated by cues indicating low social status. In other words, the psychological mechanism that induces us to seek another social

T. According to McGuire & Troisi, however, the facts are more consistent with the social competition hypothesis.¹⁵ On page 277 of their *Darwinian Psychiatry*, they state that "responses to salutary environmental change is observed among most persons with major depression... However, responses are usually minimal, and rarely do environmental alterations result in significant clinical improvement."

niche or try some other life strategy is triggered only by indicators of social status. Whether or not this is true is an empirical question, and I know of no studies that might provide relevant evidence to answer it, but *prima facie* it seems unlikely that other non-social cues never influence people to abandon life projects. Many people have surely been put off a career by the simple fact that they are bored with it rather than by feelings of inferiority.

Conversely, there are also many cases of depression that are clearly triggered by external events that appear quite unrelated to social status. The most obvious example is postnatal depression, which follows 1 in 10 births.¹⁶ (p.112) The defenders of the social competition hypothesis may answer this kind of objection by arguing that depression is not a single disorder but rather a family of disorders related only by the similarity of their symptoms. The social competition hypothesis is intended only to account for one kind of depression - that which is caused by the social competition module - and other hypotheses are needed to account for the other types. Far from being an *ad hoc* modification of the hypothesis, this line of thinking is just what should be expected from a good evolutionary psychopathology. Current

psychiatry classifies disorders on the basis of clinical phenomenology, while evolutionary psychopathology classifies disorders on the basis of a theory about underlying psychological mechanisms, and 'it is probably unwise to expect the fit between hypothetical mechanisms and currently recognised symptomatology to be too exact'.⁹ (p.15) It would actually be a virtue of evolutionary psychopathology if it could offer sound theoretical reasons for reclassifying syndromes that are currently thought to be variant forms of one disorder as distinct disorders.

See references on page 32

Birmingham Subcommittee Considers Group Process Description

At a recent Birmingham sub-group meeting consisting of Michael Chance, Dave Stevens and John Price, we discussed the October *ASCAP* and particularly the contribution by Madelaine Robbins (October 1998, pp. 8-12). Could our conceptual schemes help to clarify the rich feast of problems with which she provides us?

We looked at her "Case Study 1". She described a small company with senior management meeting in secret and their employees bursting into tears. We recognised a company operating in agonic mode.¹² The agonic mode is characterised structurally by social hierarchy, unequal payoffs and restricted communication flow. It is characterised functionally by insecurity leading to aggressive posturing on the part of the leaders (inhibited or ritualised aggression), and, on the part of the followers, fear, unease and resentment. The status difference between leaders and followers is maintained by punitive action on the part of the leaders directed at the followers. The followers are afraid of being punished or getting the sack, and may be resentful of leaders whom they do not respect. Both leaders and followers are functioning at the level of the paleomammalian (emotional) brain, which inhibits their capacity for rational thinking. What Madelaine Robbins did was to help the company switch into the hedonic mode, with free flow of information, confident leaders, and subordinates who accept and respect the leadership. She changed the company from a social structure characteristic of macaques to one characteristic of chimpanzees.

Does it help to label a company's functioning hedonic or agonic? Yes, because it is a clearer description than alternative terminologies such as well-functioning or malfunctioning; it categorises the phenomena according to principles of evolutionary social biology; and it draws attention to the correlated aspects of the two modes such as the structural and functional features mentioned above. In a dyad the switch from

the agonic to the hedonic mode is called reconciliation. The "full company meeting" suggested by the author gave an opportunity for a public form of reconciliation.

And can we throw light on the interaction at Cape Cod? Was this depicting the hedonic mode? The drama unfolds on Thursday (page 10) when the "faculty" decided to let the paying participants have the floor. While they were speaking, the faculty were reading. There were three of them. One was reading a book, one was reading an article, the third was reading the morning paper. After the session, one of the faculty approached the author (one of the paying participants) and said, "I'm told you made a comment before break but I didn't hear it; I was reading".

I think what we are seeing here is a switch from the hedonic to the agonic mode. The trigger is an insult, which is a form of down-hierarchy catathetic signal (a signal which reduces the self-image of the recipient unless it is returned in full measure). The insult is to read while others are talking, thus failing to pay attention. The insult is greater because those who gave the insult actually invited the insultees to speak, and then ignored them. The insult was not returned in full measure. The speech given by the author to the group is a masterpiece of deference, ingratiation and reframing. What she wanted to say was, "How dare you read while I am speaking?" What she actually did was to reframe the rude and insulting behaviour of the alpha males as a form of going away, or loss - "We love you and we want you back." She reframes the action from the vertical dimension of power struggle to the horizontal dimension of affiliation. This is a clever form of appeasement. It also comes into the category of "reverted escape"; a subordinate who has been punished by an alpha is motivated to escape, but is also motivated for comfort, consolation and affiliation; since the source of comfort is that same alpha who

has inflicted the punishment, the escape is "reverted", and the individual returns to the neighbourhood of that same alpha, and solicits the punisher for consolation.

In writing her ASCAP article she takes the interaction a stage further. She is getting nearer to returning the catathetic signal in good measure. She is saying "You did this to me and I was hurt by it." She still "wreathes the rod of criticism with roses", giving anathetic (boosting) comments about Robert Wright and quoting his words, and her attack on the other two alpha males is largely failing to award them equal deference to that conferred on Robert Wright (an appropriate retaliation for their failure to pay attention to her during the seminar). She has "got it off her chest" (hopefully). I found her description of being "warmly engaged" with the insulting alpha male (last paragraph of first column of page 11) to be particularly chilling. If this is really how subordinates behave in organisations, then I think the author should write more about it. It provides a good human example of the reverted escape which is seen commonly in non-human primates.

But the author was clearly undecided about how to respond to the threat offered by the alpha males. She appeased them (at least, one of them); she returned the insult in a veiled and partial way; and she also metacommunicated (talked about the talk). Meta-communication is one way out of a double bind, and in fact the Palo Alto group defined a double bind as a situation in which the victim receives conflicting instructions, cannot escape, and cannot metacom-unicate. In the case of a threat or insult, is metacommunication an alternative to fighting back or turning the other cheek? To what extent does metacommunication avoid the loss of RHP which an unreturned insult normally causes? I do not know of any research on this.

What "really" went on at the described conference? Surely, if the faculty suggested the audience speak up, and then all three ignored what they said by reading something while they were speaking, they did this deliberately in order to challenge the audience, to stimulate "process", to get things going, to make the interaction more interesting, or for some other reason.

I have trouble believing that all three of them were so boorish, even allowing for their male gender.

This insult switched the action from the hedonic to the agonistic mode. Before the insult, the faculty seem to have been in a "lekking" situation in which they were competing (hedonically) to attract members of the audience. At the time of the insult, they seem to have joined forces to form a sort of central hierarchy to put down the paying members. Aggression directed down a hierarchy (in the inhibited form of ritualised threat or insult) is characteristic of the agonistic mode, as, indeed, it is characteristic of long-tailed macaque society in which species the agonistic mode was first observed and described (by Michael Chance).

We offer these tentative comments hedonically, half expecting to be told that we have totally misunderstood what went on, and hoping that readers will decide for themselves whether the application of "two mode theory" adds anything to our understanding of the social interaction.

**Addendum in response to the question:
"What is a lek?"**

A lek is a place where males go to show off to females. A lot of birds and some ungulates do it, also the elephant seal and the hammer-headed bat (see, e.g., *Animal Behaviour* by John Alcock, Sunderland MA: Sinauer Associates, Inc. -1 have the fourth edition, 1989, but I think there is a later one).

The females go to the lek to choose a male (or more than one). Then they go away and give birth and bring up the young without any help from the father(s). On the lek, the males are competing with each other, but they are competing hedonically. That is, they are making themselves attractive to an audience (of females) rather than trying to intimidate or attack each other. On some leks the male has a territory; this is different from the territories owned, by, say, monogamous birds, because it is used just for mating and does not contain the resources needed to maintain a mated couple and raise a brood of young. On some leks the females choose a particular male, on others they choose the male occupying a certain territory (or

a territory which gives off certain odours from the soil). Leks represent the extreme of variation in male fitness, as a very few males can inseminate all the females in their area. Selection for male features attractive to females is very intense - hence the fantastic adornments of male birds of paradise, etc. The experts say that lekking tends to evolve when the male is more of a hindrance than a help to the female bringing up her young; this tends to happen when he attracts predators to the nest, but does not much increase the food supply. So a bright and shiny male is good for lekking and a drab male is good for monogamy, and an in-between male falls between the two stools.

I used the lek as a metaphor to express the situation you described at Cape Cod (or, at least, the situation I thought you described). In the Cape Cod situation, the faculty (three alpha males, and one part-time female) were showing off to the participants, attracting the latter to their seminars, and to their way of thinking. This is usual for any conference or meeting. What was unusual at Cape Cod was the episode in which the faculty read books and papers while the participants were speaking. This was unusual behaviour, which is why I thought it might be done deliberately to stimulate a response (process).

The alpha males did not insult or threaten each other (as they might have done, and so switch into the agonistic mode). Uncharacteristically, they joined together and insulted the audience. They put the audience down, redefining the status of the audience to that of subordinates (people not worth listening to).

Perhaps it is unwise to use male/female arrangements as a metaphor for the teacher/pupil situation, but it is interesting that in addition to the Cape Cod situation in which all the students are exposed to all the faculty, you also get situations in which the students enroll in classes, some with one faculty member, some with another, and this is analogous to the harem system of, say, hamadryas baboons; and, again, you get the apprentice system, in which each teacher has only one pupil, which is like the monogamous mating system. I suppose if you have two categories of actor, there is only a limited number of

ways they can associate. In the mating situation, the males are offering genes to the females, who try to estimate which are good and which not-so-good; you could say that in the academic situation, the faculty are offering memes to the students, who are trying to work out which of the faculty has the best memes.

I found your article thought provoking, and together with Don LeCroy's paper in the following month's ASCAP, it made me realise that there is a gap in our theorising, and I am preparing a discussion for the *Newsletter* try to tackle this problem that you have exposed.

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The Prince of Persian Poets Illustrates Being in Charge of Oneself

How does one feel in charge when one isn't, when someone else clearly dominates the situation? How can an oppressed person, for instance, possess alpha status despite the oppression? The genius of the human condition, I assert, lies in exactly how that comes about. Ralph Waldo Emerson translated the following verse by Hafiz, who died in 1389 A.D. and considered him to be "the prince of Persian poets."¹ But in the verse Hafiz is anything but a prince. Rather, reading between the lines, he sounds in a definitely subordinate position and runs the risk of oppression:

Give me what you will; I eat thistles as roses. And according to my food I grow and I give. Scorn me not, but know I have the pearl. And am only seeking one to receive it.

Though perhaps treated poorly, the poet-narrator does not respond as though depressed. Rather he strikes a negotiating posture. He first reframes that whatever he is receiving is positive ("I eat thistles as roses"). That is, though given poor food he will assume it to be good and do a mind-trick to assure this. He recognizes that the person that he is addressing has more power and does not directly defy this ("give me what you will"). The poet recognizes also that the powerful other may produce negative effects on him ("according to my food I grow"), but he also points out an exchange exists (with more food, he might give more service).

The last two lines suggest a *quid pro quo*: the potentially scolding oppressor may be deprived of some benefit ("pearl") if the narrator is scorned. The poet recognizes the other's higher rank; he recognizes that he *could* be scorned when he says, "Scorn me not." But he also asserts that he has a prize that he could provide were the other sufficiently giving. He suggests that his is a negotiation with benefit on his part that could be provided in exchange for benefits from the superior. Despite a lower rank, the poet is a self-

respecting person with pride, self-respect and negotiating power. He is alpha in his own way despite the other person's manifest leadership or dominance. The poet has his own storyline, one that has him in a real world where he doesn't have the reigning power, but has his own capabilities of negotiating in it anyway. Hafiz's verse exhibits the clinically defined state of euthymia (good mood/feeling state) that results when the person described feels "in charge" of self and the situation despite the circumstances.

Ignoring social realities, manic people I have known, on the other hand, would have commandingly re-phrased the Hafiz verse as follows, provided that they slowed down enough to pay attention and that they were interested in the project (it would have to feel their own)

*Give me all, no thistles for me but roses.
And I need much food to grow and thrive.
Admire me (scorn me not), I have the pearl.
Make good arrangements, you, so I can show it.*

The manic asserts power not possessed. When dealing with a doctor, for instance, the manic asserts himself as in charge despite the realities of a hospital ward and in a pressured perhaps frenzied way, tells of grand plans for improving the country or the universe. Or will have actually spent family fortunes in poorly conceived schemes. I have known such a family. They had owned a series of stores but were rendered bankrupt by one such family member, self-centered, assertive, winning in his manner so that he lost everything from manic poor judgment.

But others who are euphoric, confident, self-centered, assertive and winning are not called manic if their behaviors suit the social situation and work; if they invest the family fortunes wisely, for instance, or demonstrate good leadership. However that is,

sometimes alpha role persons are highly sexual as well, feeling entitled to propagating their sperm whenever possible (Ronald Immerman holds that this has generated sexually transmitted disease - the microorganisms had new opportunity!).

Sex in an alpha sound familiar? For all of 1998's preoccupation with Monica, I never heard the talking heads on television give the president's alpha psalic (or equivalent) credit for his interest in her. *Newsweek* though, as I recall, quoted a foreign diplomat as saying something like, "Of course, he did it. Look at who he is! What do you expect?" In *Newsweek's* Mar 1 issue, Ted Turner suggested that the 10 commandments be revised, "If you're only going to have 10 rules, I don't know if adultery should be one of them."

Reading the detailed descriptions, as in *The New Yorker*, President Clinton was remarkably restrained compared to a manic person. Indeed, he held (essentially) that it wasn't "sex" because his semen went to the famous dress, not to her vagina, where sperm are meant to go, far from the eyes of the DNA-measurers! Someone on email described it as play, psuedosex, not sex at all. I have the instructive bonobo text of Frans de Waals and Frans Lanting.² One chapter entitled "Apes from Venus," details the extraordinary sexual behaviors of these uninhibited relatives of both chimpanzees and humans.^{pp99-131} "Few sexual patterns typical of our species are absent in bonobos. ...[F]emales seem to prefer the frontal position, which guarantees optimal stimulation. Male evolution may have lagged behind, resulting in a mismatch between male and female preferences."

Relevant for the psuedo-sex that apparently happened in the White House encounter with the intern, is "Also characteristic is... psuedo-copulation.....Apart from sexual behavior, I saw patterns that are perhaps better classified as erotic in that, even if adults of the opposite sex were to engage in it, reproduction could not possibly result.... mouth-to-mouth kissing in which one partner places his or her open mouth over that of the other, often with extensive tongue-to-tongue contact.... typical of the bonobo ... totally absent in the chimpanzee, which engages in rather platonic kisses. This explains why a new zookeeper familiar

with chimpanzees once accepted a kiss from a male bonobo. Was he taken aback when he suddenly felt the ape's tongue in his mouth!... If the sounds and facial expressions of bonobos are any indications, not only masturbation, but also sexual intercourse must be quite gratifying.... [B]ased on hundreds of hours of watching bonobos,... their sexual activity is strikingly casual and relaxed." p. 105

Humans are less promiscuous, casual and relaxed unless they are used to many such sexual contacts, as those who are human leaders may have been over millenia. Returning to President Clinton, my description of him is not that of clinical syndrome but of a normal communicational state; along the above allusion to "Of course, he did it. He's a leader!" Mania can be defined as a clinical entity not because of the state itself, but because the state doesn't match the social circumstances. Clinton was clever and thought he could get away with it, especially since he deployed only pseudosex, only play-forms. Moreover, rather than arrogant dominance, part of his charm as a leader stems from his deferential manner with the public. Using Paul Gilbert's term he deploys social attention holding power. His version of Hafiz's poem is Hafiz's original, not the manic distortion.

Hyperthymic personalities (Hagop Akiskol's term) can be named such if person persistently demonstrates euphoric mood and other manic or hypomanic characteristics (see Jim Brady's quotes this issue). But these too are not defined as pathological (are not a disorder) if their actions demonstrate socially appropriate results. Episodes of bipolar illness lasting for weeks or even months, on the other hand, are typified by exaggerated communications either in manic or depressed directions.

The depressed person, on the other hand, does not at all feel in charge of his or her circumstances. The social rank theory of this unfortunate contrasting state suggests that the depressed person displays a constellation of communications that seek to propitiate another person(s), although this is not a conscious process because if it were, if the person were lying, this would be detected by potentially hostile others.

Such a person might rephrase Hafiz's poem (if he had the energy for it) as follows:

Give me what you will; I eat thistles, thorny roses, And don't deserve what little food you give. Scorn me at your will; know I have no pearl, Though if I did, you'd quickly to receive it.

This social reality is usually as distorted as that of the manic patient. Kicking in, we presume, is a communicational state that results in the person assuming a very bad social position. Thus, when an antidepressant produces a better "mood", the person now newly feels in charge and doesn't understand how he/she could have felt so bad just days or weeks before. One patient described on recovery from depression that he looked out the window and realized now that the sun was shining. His world and his situation looked bright. He felt optimistic, no longer deserving thorns and thistles.

Is "mood" state the correct descriptor for mania, depression and euthymia? I concur with the state idea — the person often feels the same over a period of time, days, and weeks—even months. But the real core to the state, I believe, is not this person-specific state that merely labels the appearance and feeling state, but rather the "communicational" features of it as illustrated by the prince of Persian poet's euthymia. Variations of his verse illustrate its differences from mania and depression. This difference in emphasis from mood to communication instead illustrates the utility of the use of "sociophysiology" as a descriptor of psychiatry's basic science.

Who might have Hafiz been appealing to in the verse quoted at the onset of this brief essay? In a preliminary verse I didn't replicate here, Hafiz referred there to the narrator as a "wanderer." The allusion was clever: though a wanderer, his message is steady wherever he is. "I, a wanderer, do not stray from myself." If we suppose him to have been a minstrel, someone who entertains in various strange settings, the verse takes on added meaning. The leader or dominant that we assumed in the analysis above is likely, in fact, an audience: he tries to appeal to strangers before him who are seeking entertainment. This explains, per-

haps, the strange allusion to eating thistles or roses? If he were a singer or other performer, bouquets might indeed come his way. Is he saying additionally that he a dancer or storyteller needs more to eat than whatever is given him in flowers? Beggars can be dominating in their attitudes, not only supplicant but demanding, feeling or presuming ability to negotiate. Hafiz's narrator shows some similarity, though he recognizes the reality that the audience is dominant (and the above considerations hold). Because he freely comes to entertain them and the fact that he is going soon gives him added negotiating power. This especially holds if he tells them interesting stories that they want to hear. Audiences are story-users, listeners and watchers but the wanderer is a story-teller as well, able to satisfy the need for novelty for which human audiences wish, at least, we conjecture, in Persia during the lifetime of the poet. But not only then. Look at the present entertainment industry. In our present day with the amplification of television, radio and recordings, entertainers persist in enormous rewards for what they do.

This adds to the idea that "being in charge" is equivalent to euthymia. Who is more commanding, more in charge at least for the moment, than a storyteller or entertainer? At least for the duration of the event, the person elicits the attention of those listening and watching. And taking on the attitude of a supplicant {"Give me what you will ") turns on both alpha and nurturant parts of the audience member as well as attending to something interesting while also showing hedonic atmosphere.

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2. De Waal F, Lanting F: *Bonobo: The Forgotten Ape*. Berkeley: University of California Press, 1997.



The Nurture Assumption and Mom and Dad

Judith Harris' book, *The Nurture Assumption*, describes many phenomena but with my own thoughts. It's good to find an ally and I am grateful because she deflates many ideological gas bags. I'm also annoyed that her editors may have let her down, that a very good case is less impressive than it might be because I love her argument but not always the way that she delivered it.

First, she has been misunderstood by at least one significant reviewer- Sharon Begley of Newsweek (8/24/98, p 53) - who labeled Harris as concluding that parents have NO effect on children. That's not Harris' position; neither is it mine. Parents have important functions that are not the ones that we usually ascribe to them. I think that we fail to recognize those roles for the same reasons that we miss the similarities in grammatical structure when we compare French with Chinese. With studying the development of either children or languages, we sometimes get carried away by surface ripples and miss the underlying rules. I offer some examples and then a model from Russ Barkley that may help.

A sense of the past

Jack (names changed) was brought to me by his mother because a school teacher thought him to be inattentive. I assessed Jack to be lively and his liveliness to be a significant asset; he could do his math and follow class discussions even if he was also under his desk chasing an eraser. These traits occur widely in his family. Mom told me later that her own mother commented, "Congratulations, you finally found a doctor smart enough to agree with us about Jack." Mothers - and some fathers - do these sorts of things all the time, in part because they are keenly aware of their own pasts.

Jill is 10 and radiates the prepubescent charm that draws perverts. She wiggles, fidgets, talks incessantly, flips her curls, and loves talking to boys. Jill is

annoyed that her mother won't let her go to school any more with a bare midriff, spaghetti straps, or a halter top. Mom and I explain to Jill that she is too mature to bare herself and too dumb to escape predators and probably will be so for the next 3 years. Mom is a determined lady who remembers her own adolescence and who chose a determined father for Jill. Jill will be monitored while she is also loved and challenged.

Ulrich, 12, still periodically wets his bed or dirties his pants. I pull out of mom that her brother, her sister's children, and her uncle all had similar problems. We reassure Ulrich that a good number of his male friends have the same difficulty for the same reason and outline some ideas that should make his problems less frequent. He would have been a freak whose problem stemmed from a lack of "will" except for the information that his mother carried about her relatives.

Too much sense of the present - contributions from Russ Barkley

Russ Barkley (*ADHD and the Nature of Self Control*) is an expert on impulsive minds that have been labeled as Attention Deficit Hyperactivity Disorder (ADHD). His model looks past overt hyperactivity to the more complex lapses that are of greater significance in all of our lives, especially those of ADHD children or adults. He notes that impulsiveness is associated with a failure of response inhibition and leads to failures in language acquisition and retrieval, difficulty making and sharing plans, a diminished sense of time and of the Self, impaired self regulation of emotion (either to inhibit it or to kindle it so that feelings increase the chances for delayed reinforcers to be earned), difficulties analyzing complex situations, and difficulties identifying novel event sequences in order to solve problems. (There are probably a dozen new studies each year that are consistent with Barkley's model.) These abilities are reflections of "executive functions," bits of behavior- mediated by our frontal orbital areas - that regulate other bits of

behavior. Impairment is reflected by erratic social plans, impaired word retrieval, difficulty sequencing ideas orally or in writing, and a host of other gaffs summarized by the word, "immaturity."

Russ borrows both his model and some language ~ as I do - from Jacob Bronowski when he talks about "a sense of the future" in reference to the core deficits of ADHD. Memories of what we did yesterday are imposed on information that we have about today. We can talk about those two sets of impressions, note differences and similarities, and project what may happen tomorrow. This "sense of the future" is perhaps the finest trophy awarded to us by natural selection over the past 200,000 years because it allows us to anticipate change, to notice patterns in our errors, and not to repeat them indefinitely.

Barkley focused on our ability to develop working memory and mental agendas and to develop abstract rules for ourselves. The absence of these capacities produce a perpetual "now" that leads us from impulse to impulse. Overcoming "now" depends on our having intact executive functions and a meaningful, rather than an oppositional, free will that allows us to develop plans on a Monday and then to execute them on Friday.

I've often found it useful to look for other mechanisms that store our past, hold it for display alongside the present, and allow a mental or behavioral anticipation of future outcomes. These mechanisms exist in other species and may have varied expressions in groups of humans. For example, "genes" are one instantiation of executive functions, so are culture and history. So are parents.

Harris remarks well that children and adolescents invent new cultures each generation (not strictly true but that's another story!). Parents, however, anchor those inventions so that children have a wider array of response options than might have been derived on the long term choices.

- Divorce - marital outcomes for children seem to have substantial heritability. Aggressive discipline and aggressive children - impulsive, angry people are more likely both to have challenging offspring but also to use

spot. Culture supplies a reservoir of past solutions that may work for current or future dilemmas. Culture and parents help us to challenge superstitions that are built adventitiously by each generation, to maximize the probability of reinforcement, to reduce delays in reinforcement, and to identify the nature and length of delays that occur in reinforcement. Genes and culture, parents and friends are nature's tricks that assure our range of behavior options will exceed the range of surprises contained in our niche. The kids would survive without such networks - they've done it before - but I don't think they would do as well from moment to moment in the resulting cultural and familial analog to ADHD.

Tactics - I have to applaud her strategy. She knows that it's foolish to attempt converting people, the social psychological traditionalists, who have never been in her church. Instead, she has made an endrun to the general public who often responds to shorter books and to darts flipped toward the intellectual elite. Good job!

Targets - "I like to be the last doctor to see the patient before they get well" remarked one of my favorite pediatricians. He, unlike many of our teachers, recognized his limits. He would not have become a target for Harris who fires a cannonade at the beatitudes of our time, the "just so" tales that make the Sunday papers and the self help racks at Waldens. She is needed by our belief system for the same reasons that cells need apoptosis and Rome needs a good bulldozer. She gleefully lances environmentalist explanations for

- Obesity - pudgy genes in average settings produce overweight people. However, recent discussions in Science hint these same genes confer superior metabolic efficiency and might have greater survival advantages in "lean" times and niches. This latter is an "environmentalist" consideration but differs from the lectures and modeling effects that Harris lampoons.
- Smoking - perhaps an outcome of peers that get you to try the weed and genetics that keep you hooked on it. (True for marijuana as well as nicotine.) In these instances, peers as well as parents display menus from which our genetic heritage, tuned from moment to moment by our niche, makes short and

harsher measures to inhibit those children. (Barkley has remarked in his talks that severe discipline that is consistently given does NOT produce disruptive children. Harsh discipline that is given inconsistently does.)

- Birth order - she and Sulloway have substantial disagreements and he will either ignore her or defend himself. Neither of these characters appear suited for middle grounds - the debate will be an all or none event. I can't predict if Frank will defend himself or will elect an alpha chimp, "yawn" routine.
- Separate bedrooms for small children - I routinely counsel mothers who are anxious about their children's efforts to share parental beds. It's fear in the child and in the mother and we are one of the few cultures to insist on early separations. I can now cite Hams.
- Teen rebellion - a process of differentiation for many of them but also another reflection of disruptive parents being more likely to have disruptive, oppositional children and for such parents also being less likely to supervise their children consistently.
- Large schools (bless her especially for this one!) make peer networks more powerful to the extent that similar children find more clones of themselves in a larger school. Not only do the immediate peer group choices become more varied, so do the options for mate selection. Given that "similarity" is a primary consideration in mate choice, it could be that larger schools give the bipolar or the anxious kids more opportunities to find matches for themselves and to produce children with more extreme traits than either parent.
- Self esteem - not a matter for lectures and praise and lies but for accomplishment and niche tuning. Thankyou!
- John Bradshaw, Ben Spock (a son of Margaret Meade), Frank Sulloway- all pecked by Ms. Harris. Tom Bouchard slid past, working the sets for her production, invisible to the audience. He's given comparatively little attention despite the large implications of his research for genetics interpretations of human behaviors.

In all of these domains, parental explanation and example are less influential than environmental opportunities. She could have explored the concept of

"tuning" - that John Fentress taught to me - which has so many promises for all of these domains and easily could lead to a companion volume to The Nurture Assumption. Tuning allows us to say that fat people occur in fat niches. Chronically depressed people can become grandiose and domineering if moved to areas where they have a competitive edge. Self esteem elevates from winning and not from strokes by a guidance counselor. I think Harris could have been more stingy with her anecdotes and had room for "tuning" in the same number of pages.

Next, gossip is welcome by most of us perhaps for reasons described by Robin Dunbar and Russ Gardner. I enjoyed her informal discussions of her favorite studies. For example, rearing Donald and Gua Kellogg together resulted in Don's starting to act like a chimp, not the reverse. Her informal, personal needling of Frank Sulloway's work probably gave him spasms at night while she was writing. She applies similar causal skepticism to a wide array of environmentalist data and truisms.

On the other hand, she sometimes introduces an issues, "biology is not destiny" and doesn't handle the implied modification of her main premises for the book. She also opens a chapter on "what parents can do" but quickly drifts to barbs instead of solutions. She attributes differences in piano accomplishments by a set of twins to their having two different mothers. While her position is likely true, "mom's influence" appears most important for twins in that two people occupy a womb for one. Twin similarities probably understate the genetic influences that can exist for our daily mannerisms and life choices. I wish Harris had explored these possibilities.

Style -1 should look up her paper in the Psychological Review in order to appraise whatever distortions may have occurred in her writing similar material for popular consumption. It could be that she has too little information for the book that she wrote. It could also be that there were too many incentives - missing for the Review paper - to be outrageous and entertaining.

My own limited experience in a similar effort included directions from a prospective agent to "write down to

the audience and give lots of pictures," his directions embellished with visions of a \$160,000 advance. I learned a lot, including about my own mulish nature that prevented acceptance of such directions. Still, the temptations kept me awake for weeks and are a reflection not of the agent but of our current setting which allows massive distribution but for a very limited range of materials. In scholarship and the arts as elsewhere in nature, removal of boundaries reduces diversity. A few types thrive, many others die. We can have a "number one" for each of many isolated domains or a single "number one" for the same total expanse after electronic access and distribution have removed the former boundaries. Madonna now reaches the thousands of audiences that once devoted themselves to Susie Sweeney from next door who now dreams of where she might have been. A prospective best seller pulls \$200,000 up front while most authors earn about as much from their writing as mushroom pickers.

The removal of boundaries produces r-Selection conditions for a limited number of species who invade the new territories. Successfully invading species, like invading armies, take territory quickly, reproduce quickly, and invest little in their children while on the move. Such conditions apply to graduate schools as well as to publications. Harris was once excused from Harvard's graduate program in psychology; in *The Nature Assumption*, she highlights G. A. Miller's role in that decision and the irony of her winning the "G. A. Miller" award for her paper in the *Psychological Review*! My suspicion is that Harvard chose not to invest in her because they had more students readily available and of comparable ability, students who for whatever reasons were sectors of a more privileged circle. Students often tend to be plentiful, eager, and disposable and are supposed to "pass through" without much protection from tit-for-tat principles that say "cheat 'em if there is no extended relationship." Those who don't fit local templates of "genius" are shown the door quickly.

To an extent, Harris could also have been betrayed by her editors as she was perhaps once betrayed by her teachers. *The Nurture Assumption*:

- Says too much for what it has to say; a shorter book would have delivered a more powerful message. My impression is that Harris may have attempted to write every good idea she has, perhaps an r-Selection strategy that is associated with the lack of enduring ties to her audience.
- Engages in some "Just So" tales but doesn't always label them as such. She compounds the problem by not giving reference links within her text. Thus, it's difficult to separate her own ramblings from that based on ramblings by other people. I think that many of us weight sentences by the names and dates attached at the end. Harris puts lots of references at the end of the book but you have no awareness of her anchor points as you read the main text.
- Seems better at picking ideas and studies apart than at building coherence. For example, she does a magnificent job putting holes in *The Lord of the Flies*. The one boy was near-sighted and his lenses had the wrong curvature to make a fire from sunlight. Golding says he did it anyhow. On the other hand, her hints about "what to do" or smoking, for oppositional children, for obesity, and for the rest of her lists remain hints. She may have other manuscripts in production and doesn't want to tell us. If so, then she is treating us, her audience, as consumables.
- Jumps topics more often than I do. I sympathize and empathize and am more annoyed because a good editor should have helped her and did not. All in all, this could have been a great as well as entertaining book rather than being a scattered and entertaining one.

A sense of the future

Solutions - there are not many of them and it may be that Harris is better at demolition than building. The former is usually more immediate, dramatic, and certain than the latter. Thus, you have to read between the lines to see the possibilities in smaller schools, changing the neighborhood where you live, and picking friends for your child. You also need to monitor, monitor, monitor the phone, the room, the auto and show up where your children say they will be!

All of these techniques are known and advocated by other sources but who get less attention. For example, *It's not Your Fault* (Harold Koplewicz, Times

Books, 1997) is convincing and useful in regard to ADHD, OCD, separation anxiety, social phobia, bedwetting, Tourette, depression, bipolar disorder, schizophrenia, eating disorders, and conduct problems but has not gotten the same splash as *The Nurture Assumption*. The possible models of developmental tuning effects and gene expression in different niches offer universes of new treatment possibilities but it might take a combination of a clinician and a neurodevelopmentalist such as John Fentress to parent it. Exploration of familial histories, discovery of personal niches wherein success is more probable, relief from the miseries that elevate our glucocorticoids and shrink our left hippocampi, an understanding of the likely effects of parental discord and step-parents on both male and female children - are all important tasks for a clinical sociobiology (or a sociophysiology!).

Finally, we still haven't a full understanding of "learning." New cells sprout in the hippocampus, perhaps in relation to temporal excitability, perhaps most easily in domains wherein we already have some talent. Ebbinghaus told us that learning was most rapid with materials of high familiarity or high meaningfulness. Such material might reasonably derive from our psychological adaptations; we become more likely to invest time and attention to things that come easily. Still, given sufficient incentives (perhaps from ancillary adaptations!) we CAN learn nonsense syllables of low meaningfulness and familiarity. We CAN learn chemistry or calculus although we may not "understand" it until much later. "Learning" allows us to track the environment more rapidly than if we relied solely on genes and on hormones. We can't let it slip past us while at the same time we employ "learning" as a shield against Bouchard's observations. There may still be some function for all those lectures that mother gave to us and that we often but sometimes unwillingly, repeat to our own children.

Harris and others present opportunities for us; let's use them wisely

Rhinos Mating

In a large wallow on the Discovery channel an old bull closes in on a female, who is moving slower and slower the closer he gets, until she stops and is mounted; dumptruck-upright, he unloads and she receives— both equally joyous, I assume. Then she moves on again, leaving her spent pursuer behind.

Meanwhile, another bull—younger and bigger and huffier than the first one—has sniffed the broadcast female scent, and drops down into the wallow, disdaining the first bull, who can only stand and watch, being too small to accept the challenge.

Now the spry one catches up to the female, who slows down just long enough for the long, curved, indefatigable pizzle to find its way into her armour-plated body, he unloads his youthful sperm as she receives it—no doubt—with appropriate rhino spirit, and the two move on in tandem.

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Genome Data Bearing on Basic Plans

This represents introductory comments to the following article discovered in my pre-moving review of all accumulated *Science* and *Nature* journal issues from over the past twelve or thirteen years, now being reduced to their core pieces of information important to me personally. These journals published weekly provide treasure troves of information on genome-neural-behavioral analysis that I believe to be core to a basic science of psychiatry and the clinical human sciences that I expect to develop in the twenty-first century. Basic plan thinking involves a sophisticated understanding of ancient body components that were platforms to other body parts derived less remotely in our ancestral past, still ancient but less so.

Certainly human behavior depends on our appendages. From which genes do they stem and are some parts less fundamental than others? Shubin, Tabin and Carroll address exactly this in the following review article in which they tell us of the Hoxgene expression in body tissues. This represents exciting work in the "evo-devo" field (that combines evolutionary and developmental biological questions).

Shubin N, Tabin C, Carroll S: Fossils, genes & the evolution of animal limbs. *Nature* 1997;388:639-648.

Abstract: The morphological and functional evolution of appendages has played a crucial role in the adaptive radiation of tetrapods, arthropods and winged insects. The origin and diversification of fins, wings and other structures, long a focus of palaeontology, can now be approached through developmental genetics. Modifications of appendage number and architecture in each phylum are correlated with regulatory changes in specific patterning genes. Although their respective evolutionary histories are unique, vertebrate, insect and other animal appendages are organized by a similar genetic regulatory system that may have been established in a common ancestor.

Extracts: The origin of evolutionary novelties raises some of the most fundamental questions of biology. How do new structures arise? Can they evolve *de novo* or are they generally derived from pre-existing structures? What is the developmental and genetic basis for their origin and modification?

The adaptive evolution of vertebrates and arthropods to aquatic, terrestrial and aerial environments was accomplished by the invention of many novel features, especially new types of appendages. Enormous progress has been made in the past few years in understanding appendage development in both phyla. These genetic discoveries can be integrated with palaeontological data to address some of the principal events in the history of animal designs....

We will explore the significance of newly discovered genetic similarities between arthropod and vertebrate appendages-similarities that have been retained despite more than 500 million years (Myr) of independent evolution. We will develop the hypothesis that the evolution of successively derived limb types, from lobopods to insect wings, and from agnathan fins to tetrapod limbs appears to be due to the successive cooption and redeployment of signals established in primitive metazoans. The examples illustrate how comparative developmental genetics can provide a mechanistic explanation of the origin and evolution of structures when palaeontological data are robust and important new hypotheses about evolutionary history when the fossil record is silent....

The number of paired appendages has been highly conserved ever since their origin: the evolution of new gnathostome body plans primarily involved a modification of existing paired appendages rather than the invention of a whole new sets.... Therefore, the origin of more recent novelties, such as digits, involved the modification of genetic systems first established in more primitive vertebrates....

Primitive genetic systems must have provided a framework for the evolutionary integration of pectoral and pelvic appendages. Digits, for example, arose at the same time in the hand and the foot: there is no Devonian tetrapod that has fingers and no toes.... many unique designs appeared simultaneously in forelimbs and hindlimbs, as witness by chameleons, ungulates and ichthyosaurs. Obviously serially homologous appendages can also evolve independently, an extreme case being the modification of pectoral appendages into wings in bats, birds and pterosaurs [though with] numerous similarities... retained between wing and leg.

The linkage between forelimbs and hindlimbs appears to be an ancient feature that resulted from patterns of gene cooption during the evolution of Palaeozoic fish. ... *Hox* genes, particularly, are likely to have been involved in the evolution of serial homology.... *Hox* gene expression in extant tetrapod limbs... encompasses at least three distinct phases.... [This] may reflect the observation that all tetrapods may maintain a standard pattern of organization, whereas specific differences in expression (or gene interaction) in each phase could result in independent modification of pectoral and pelvic appendages....

Some regions of vertebrate appendages are more variable than others. The invention of flippers, wings and other specialized limbs often involved significant changes in the patterns of distal structures rather than proximal ones.... Both genetic and fossil evidence support the hypothesis that digits are evolutionary novelties.

The origin of digits is associated with the evolution of new temporal and spatial patterns of gene expression and regulation. In extant tetrapods, the development of digits correlates with a reversal of anteroposterior order of development of *Hox* genes... [Utilization of a [single] distinct enhancer is consistent with the hypothesis that digits are evolutionary novelties because the development of the autopod [hand or foot] is regulated separately from the rest of the limb....

Many classical morphologists were interested in

defining 'laws of form' - common trends that appear in widely different groups. Comparative analysis of diverse taxa now offers the promise of fundamental insights into these long dormant questions.... One notion, 'Morse's law of digital reduction', contrast the stability of inside digits (III, IV) with the lability of outside ones (V, II, I). In virtually every known example of digit reduction, digits V, II and I are among the first to be lost, and digits III and/or IV are typically retained in tetrapods that have the most extreme forms of digital reduction.... in lizards, dinosaur and bird feet, and in mammals (for example, ungulates)....

Are regularities of digital evolution the product of developmental contrasts upon variation? Knockouts of various *Hox* genes (*HoxD-11*, *HoxD-12*, *HoxD-13*, *HoxA-13*) lead to changes in the shape and number of bones in affected mice and these different genes have overlapping effects. One common result is the stability of the internal digits... in knockouts of single genes or combinations of genes. The parallels between the expectations of Morse's law and the result of experimental manipulation suggest that trends of digital evolution may have a developmental basis.... [Moreover], the first digits to be affected are the last to form in development....

The appendages of [chordates and arthropods] are not homologous because phylogenetic intermediate taxa (especially basal chordates) do not possess comparable structures. The surprising discovery of recent molecular studies, however, is that much of the genetic machinery that patterns the appendages of arthropods, vertebrates and other phyla is similar [suggesting] that the common ancestor of many animal phyla could have had body-wall outgrowths that were organized by elements of the regulatory systems found in extant appendages....

[P]hylogenetic distribution of regulatory circuits and morphological structures presents two major interpretations: either similar genetic circuits were convergently recruited to make the limbs of different taxa or [they are] ancient and patterned a structure in the common ancestor of protostomes and deuterostomes....

Evidence [for] an ancient common mechanism... comes from phylogenetic comparison of the expression of the transcription factor *Distal-less (Dll)*.... of the hundreds of transcription factors that could have been used, *Dll* is expressed in the distal portions of appendages in six coelomate phyla makes it more likely that *Dll* was already involved in regulating body wall outgrowth in a common ancestor....

[B]ird wings and bat wings are analogous as wings, having evolved independently for flight in each lineage. However, at a deeper hierarchical level that includes all tetrapods, they are homologous as forelimbs, being derived from a corresponding appendage of a common ancestor. Similarly, we suggest that whereas vertebrate and insect wings are analogous as appendages, the genetic mechanisms that pattern them may be homologous at a level including most protostomes and deuterostomes. Furthermore, we propose that the regulatory systems that pattern extant arthropod and vertebrate appendages patterned an ancestral outgrowth and that these circuits were later modified during the evolution of different types of animal appendages. Animal limbs would be, in a sense, developmental 'paralogues' of one another; modification and redeployment of this ancient appendage system in different contexts produced the variety of appendages seen in Recent and fossil animals

Dickman S: Possible new roles for *HOX* genes (report from Madrid-based Juan March Foundation Workshop on development and evolution (evo-devo). *Science* 1997;278:1882-1883

Extract: Peter Holland from University of Reading in UK reported that he and his colleagues had found a putative second cluster of HOX-like genes in *Am-phioxus*, a fishlike marine invertebrate that is seen as a crucial evolutionary link to vertebrates. A great deal of research has shown that the HOX genes — so called because they carry a DNA sequence known as the homeobox - play important roles in laying down the head-to-tail patterns of embryos of organisms ranging from worms to flies to humans....

HOX genes have long been known to be active in ectoderm, the outermost germ layer, but Holland found

that the new "sister cluster" of HOX-like genes is expressed in the innermost layer, the endoderm. The results suggest... that the appearance of the new cluster- presumably resulting from duplication of a primordial HOX-gene cluster- is related to the creation of multiple germ layers in early evolution....

Holland [discovered this] studying a set of HOX genes that has long puzzled developmental biologists. Almost all HOX genes are arranged in clusters of roughly nine genes each. The expression patterns... tend... to be expressed with those at one end expressed more anteriorly, while those at the other end are active further back. But... three or four types of HOX-like genes don't seem to fit this neat pattern. [T]hey carry a typical homeobox sequence [but] never been shown to be part of a cluster....

[T]hree of these orphan HOX genes are in fact clustered in *Amphioxus* the way true HOX genes are ... located in adjacent regions of a single chromosome [and using probes from vertebrate HOX genes tracked] down a third... located close to the other two. [H]e concluded, "the two gene clusters originated suddenly by duplication of a primordial cluster."...

[T]hey differ from other HOX genes in one key respect: They are expressed only in the endoderm.... Holland used data from other laboratories to show that analogous genes in mice and frogs are expressed in the gut.

RG final comment: This work illustrates hot pursuit of basic plan research in molecular biology.



Medvec VH, Madey SF, Gilovich T: When less is more: counterfactual thinking and satisfaction among Olympic medalists. *J. Personality Soc Psychol* 199; 69:603-610.

Abstract: Research on counterfactual thinking has shown that people's comitonal responses to events are influenced by their thoughts about "what might have been." The authors extend these findings by documenting a familiar occasion in which those who are objectively better off neonthless feel worse. In particular, an analysis of the emotional reactions of bronze and silver medalists at the 1992 Summer Olympics - both at the conclusion of their events and on the medal stand- indicates that the bronze medalists tend to be happier than the silver medalists. The authors attribute these results to the fact that the most compelling counterfactual altenative for the silver medalist is winning the gold, whereas for the bronze medalist it is finishing without a medal. Support for this interpretation was obtained from the 1992 Olympics and the the 1994 Empire State Games. The discussion focuses on the implications of endowment and contrast for well being.

Howard RS, Lively CM: Parasitism, mutation accumulation and the maintenance of sex. *Nature* 1994;367:554-557.

Abstract: Two classes of models attempt to explain why obligate parthenogenesis only rarely replaces sexual reproduction in natural populations, in spite of the apparent reproductive advantage that parthenogens gain by producing only female offspring. The mutation-accumulation models suggest that sex is adaptive becasue it purges the genome of harmful recurrent mutations. The ecological genetic models postulate that sex is adaptive in variable environments, particularly when the relevant variation is generated by revolutionary interactions with parasites. Both of these models have considerable merit, but would seem to have limitations. The mutation-accumulation models require high rates of mutation, the coevolution-ary models require that parasites have severe fitness

effects on their hosts. In addition, parasites could select for clonal diversity and therefore and thereby erode an advantage that sex gains by producing variable progeny. Here we consider the interaction between mutation accumulation and host-parasite coevolution. The results suggest that even moderate effects by parasites combined with reasonable reates of mutation could render sex evolutionary stable against repeated invasions by clones.

Katz PS, Getting PA, Frost WN: Dynamic neuromodulation of synaptic strength intrinsic to a central pattern generator circuit. *Nature* 1994;367:729-731.

Abstract: Motor circuits are often thought to be physically separate from their neuromodulatory systems. We report here a counter example, where neurons within a circuit appear to modulate synaptic properties of the same circuit during its normal operation. The dorsal swim intemeurons (DSIs) are members of the central pattern generator circuit for escape swimming in the mollusc *Tritonia diomedea*. However, DSI stimulation also rapidly enhances the synaptic potentials evoked by another neuron in the same circuit onto its follower cells. This modulatory action appears to be mediated by serotonin (5-hy-droxytryptamine); the DSIs are serotonin-immunoreac-tive, and bath-application of serotonin mimics and occludes the effect of DSIs. These results indicate that during the escape swim, circuit connection strengths are dynamically controlled by the activity of neurons within the circuit itself. This 'intrinsic neuromodulation' may be important for the animal's initial decision to swim, the generation of the swim motor programme itself, and certain types of learning.

Marten-Wilson WD, Tyler LK: Dissociating types of mental computation. *Nature* 1997,387:592-594

Abstract: A fundamental issue in the study of cognition and the brain is the nature of mental computation. How far does this depend on internally represented systems of rules, expressed as strings of symbols with a syntax, as opposed to more distributed neural systems, operating subsymbolically and without

syntax? The mental representation of the regular and irregular past tense of the English verb has become a crucial test case for this debate. Single-mechanism approaches argue that current multilayer connectionist networks can account for the learning and representation both of regular and of irregular forms.

Dual-mechanism approaches, although accepting connectionist accounts for the irregular forms, argue that a symbolic, rule-based system is required to explain the properties of the regular past tense and by extension, the properties of language and cognition in general. We show here that the regular and irregular past tense are supported by different neural systems, which can be dissociated by damage to the brain. This is evidence for functional and neurological distinctions in the types of mental computation that support these different aspects of linguistic and cognitive performance.

Saetre G-P, Mourn T, Bures, Krai M, Adamjan M, Moreno J: A sexually selected character displacement in flycatchers reinforces premating isolation. *Nature* 1997;387:589-592.

Abstract: Theory suggests that natural selection against the production of unfit hybrids may reinforce barriers to gene flow, eventually leading to reproductive isolation of differentiated populations, this mode of speciation may be achieved by female choice selecting for a divergence in male secondary sexual traits that facilitates species recognition. Although intuitively appealing, conclusive evidence for such reinforcement is generally lacking, and serious doubts have been raised about its validity. We have tested key predictions of the reinforcement hypothesis, using molecular techniques, field observations and mate choice experiments. In populations where two species coexist, we show that female choice selects for a divergence in male plumage colour and the resulting character displacement reduces the frequency of hybridization.



Vila C, Savolainen P, Malclonardo JE, Amorin IR, Rice JE, Honeycutt RL, Crandall KA, Lundeberg J, Wayne RK: Multiple and ancient origins of the domestic dog. *Science* 1997;276:1687-1689.

Abstract: Mitochondrial DNA control region sequences were analyzed in 162 wolves at 27 localities worldwide and from 140 domestic dogs representing 67 breeds. Sequences from both dogs and wolves showed considerable diversity and supported the hypothesis that wolves were ancestors of dogs. Most dog sequences belonged to a divergent monophyletic clade sharing no sequences with wolves. The sequence divergence within this clade suggested that dogs originated more than 100,000 years before the present. Associations of dog haplotypes with other wolf lineages indicated episodes of admixture between wolves and dogs. Repeated genetic exchange between dog and wolf populations may have been an important source of variation for artificial selection.

Childress AR, Mozley PD, McElgin W, Fitzgerald J, Reivich M, O'Brien CP: Limbic activation during cue-induced cocaine craving. *Am J Psychiat* 1999;156:11-18.

Abstract: Since signals for cocaine induce limbic activation in animals & cocaine craving in humans, the...study...test[ed] whether limbic activation occurred during cue-induced craving in humans. Using positron emission tomography, the[y]...measured relative regional cerebral blood flow (CBF) in limbic and comparison brain regions of 14 detoxified male cocaine users & six cocaine-naïve comparison subjects during exposure to both non-drug-related & cocaine-related videos and during resting baseline conditions. During the cocaine video, ...cocaine users experienced craving and showed a pattern of basal ganglia CBF relative to their responses to the non-drug video. This pattern did not occur in the cocaine-naïve comparison subjects;... the two groups did not differ in their responses in the comparison regions (ie, dorsolateral prefrontal cortex, cerebellum, thalamus, & visual cortex). These findings indicate that limbic activation is one component of cue-induced cocaine craving. Limbic activation may be similarly involved in appetitive craving for other drugs and for natural rewards.

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