# ASCAP NEWSLETTER

**Across-Species Comparisons And Psychopathology Newsletter**

Volume 6, No. 4, 15 Apr 1993 (Cumulative #65)

"One has to reflect, really, what a remarkable thing ... nucleic acids, certainly DNA and RNA, almost surely existed on the earth for billions of years. It is the basis of al_[ the life forms we see, but really, it's only been in the last half-century--which is a blink, really in time—that any form of life on Earth has become aware of the structure of DNA. Francis Crick

The ASCAP Newsletter[2] is a function of the

**International Association for the Study of Comparative Psychopathology (IASCAP)**[3]

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Newsletter aims; 1. A free exchange of letters, notes, articles, essays or ideas in whatever brief format.
2. Elaboration of others' ideas.
3. Keeping up with productions, events, and other news.
4. Proposals for new initiatives, joint research endeavors, etc.

**IASCAP** Mission Statement; The society represents a group of people who view forms of psychopathology in the context of evolutionary biology and who wish to mobilize the resources of various disciplines and individuals potentially involved 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 that focusing on cellular processes to that focusing on individuals to that of individuals in groups.

HBES is coming 1 Submit abstracts by May 1 and plan to interact with **IAS-CAP** members while at the Binghamton, NY meeting Aug 4-8. We need group discussion about the organization and potential collaborative research.

Contents; 1. Letters from Mark Erickson & Dan Wilson ..... pi



Letters; *3-19-93*

*You probably have seen the Brit J Psvchiat article by C.U.M. Smith entitled Evolutionary biology and psychiatry (1993/162:149-153 Feb 93). If not, I'm sending along a copy. Not*

*only is it interesting and pertinent but he cites your excellent 1988 chapter in a very prominent way. This is certainly encouraging (the evolutionary ideas in this sort of forum).*

*I've also included a newsclipping concerning W.D. Hamilton....*

*Mark Erickson, San Francisco, CA.* San Francisco Chronicle 5/20/93: Genetic Researchers Win Swedish Prize. Stockholm--The Swedish Academy of Sciences awarded a $338,000 prize yesterday to two scientists from Britain and the United States for their work in behavioral genetics.

Half of the Crafoord Prize for 1993 went to biologist Seymour Benzer at the California Institute of Technology for his studies on behavioral mutants in the fruitfly. British zoologist William Hamilton at the University of Oxford shared the prestigious prize for his theories on kin selection and genetic relationship in the evolution of altruistic behavior.

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Letters (continued) *3/23/93*

*Urged on some years ago by Steve Heisel, we traveled to Down House in Kent near London. Readers may remember that this was the Darwin home wherein was written almost all he had to say. He rarely sallied forth after the Beagle days. Anyway, it was a British Mothering Day and quite pleasant so what else for the devoted family to do than a pilgrimage. Indeed, we even pilgrimmed on to Canterbury. It is in fact a dull house and would be ugly were it not for the crisp white paint. The house is a big family affair though not a mansion. The gardens are nice as is the 'sand-walk.' path Darwin trod nearly every noon in pensive mood. The study is very nearly complete and, for me, the highlight of the house. The corner privy serves to remind us all that our hero was human, after all. There other displays are also of interest. I especially enjoyed the items of Grandpa Erasmus Darwin—a sadly overlooked figure not only in evolution but much of science—and the various original Punch and Vanity Fair cartoons of Darwin, Huxley, Bishop Wilberforce and all the other usual suspects. One special treat was to chat with Soleve Morris, the Curator. Dr Morris is herself a geologist but oversees the house on behalf of the Royal College of Surgeons which owns it in trust to the nation. She is quite knowledgeable and keen when real fans turn up. Unfortunately, our baby's enthusiasm for Darwiniana is not so great as ours. We had to move along. But, I hope to get back. ASCAP readers wishing to visit might usefully contact Dr Morris about any special projects or research questions. It is generally open Wednesday-Sunday from 1-6 pm (but closed most Mon-Tue, all of Feb and from mid-Dec through New Year's day). Visit, or send a donation.* DOWN HOUSE, Downe, Kent BR6 7JT, England.

*Dan Wilson, Cambridge, England*

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Michael R A Chance column

I have just finished reading Chris Knight's *Magnum Opus* entitled Blood Relations; Menstruations and True Origins of Culture. I want to tell ASCAP readers that it is far superior to the references I gave to his work in my letter in the Feb 1993 ASCAP. (Incidentally a correction in that same letter is that Steven Shennan— not Sherman as written—is a member of the Radical Anthropology Group.)

Knight's is a richly informative work based on archaeological endurance and anthropological reasoning suggesting that the surprisingly successful ability of *Homo sapiens* to expand out of Africa into Europe and Asia during the coldest phase of the last ice age was a direct consequence of a revolution in the control of human social behavior. Away from a private interactional system to one dependent on control by ideation (ie, culture) as at this time *Homo sapiens*

had become almost wholly dependent on meat. From successfully hunting large game the women had to ensure that the men hunters brought back the kill to be shared out by the women folk who made sex dependent upon this taking place. This is a future time dependent on language in which the root of grammar is temporal delineation. By synchronizing their menstrual cycles with that of the moon, they (the women) created a monthly cycle of sex while followed by feasting and sexual celebration which powerfully bound the members of a group together and it is suggested created a far-flung culture.

The book copiously documents and ably handles diverse sources of evidence and is very enthralling.

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The three-fold increase in human brain size by RG

In casually looking at Loren Eiseley's famous The Immense Journey (1957), I found the following:

> Today Piltdown is gone. In its place we are confronted with the blunt statement of two modern scientists, MRA Chance and AP Mead. "No adequate explanation," they confess over eighty years after Darwin scrawled his vigorous "No!" upon Wallace's paper, "has been put forward to account for so large a cerebrum as that found in man."

Eiseley had developed earlier in the chapter that Wallace, who noted that natives who weren't formally educated were still as intelligent as civilized people, could not himself account for the big brain as having arrived via natural selection. Darwin felt it could (hence the "Nol") although he had no mechanism. It is with that elusive mechanism that has many doing much thinking.

As those of us reading his column may gather, Michael Chance *might* say this differently 3+ decades later (note what he says above and I'm waiting for his response to these words in a future column!). I'm waiting, for instance, to learn from Chris Knight's book (which I haven't yet read) or from Michael something about human menstruation being unique to humans. Of 79 primate species including lemurs, clearly demarcated menstrual bleeding occurs in 20 (25%).[6]

Moreover, much has been made of the 'fact' that humans "uniquely" fail to have estrus. Physiologist Jared Diamond's The Third Chimpanzee reviews six evolutionary theories concerning how this made a difference in how human marital pairs relate to one another. Yet from the Hrdy & Whitten survey, six of the 79 species are open to copulation throughout their cycles and humans are amongst ten species in which there is a mild tendency towards mid-cycle mating.

Do these facts undercut the amount of discussion of human uniqueness vis a vis the ovulatory/menstrual cycle?

Back to Eiseley's "no adequate explanation"—we still do not know how the head managed to get so much bigger. Diamond also states, "Between human language and the vocalizations of any animal lies a seemingly unbridgable gulf." By the end of the chapter, he uses vervet vocalizations and Bickerton's Creole findings to suggest that "Now we have identified not only parts of bridges starting from both opposite shores, but a series of islands and bridge segments spaced across the gulf." Diamond has spent considerable time in New Guinea and knows pidgin (20% of the world's languages are here).

Other interesting suggestions about how the human brain got so big have been put forth recently: William Calvin discusses the "Throwing Madonna." This neurophysiologist from U Washington has written a series of books involving paleohistory and human evolution. His most fundamental suggestion holds that hominids occupied an ecological niche filled by no other animal. He suggests they captured prey with little risk by throwing projectiles with increasingly

good aim. Jane Goodall talks of chimps throwing, and with surprising accuracy, but Calvin notes that humans do it far better than any ape: no potential baseball pitchers amongst the gorillas.

The following Goodall quote tells us that chimpanzees *do* most definitely throw, but that Calvin's point still holds:

> Frodo perfected the throwing technique... Frodo scored direct hits rather more often than other stone-throwers, not so much because his aim was better, but because he approached to within a couple of feet."[11]

Calvin notes to throw further and to calculate such trajectories with ever greater precision, one needs ever larger central processing units, ie, more neurons and more inter-neuronal connections. He feels that adaptation to the ice ages caused protohumans to increase such calculating ability ever better. Throwing madonna stems from the idea that hominid women would have had to travel with baby-in-arms; babies are comforted more with a left-armed carry leaving the right arm open for throwing; hence we are predominantly right-handed today. This seems fanciful, and indeed he still considers it so, although he published it in the J Theoret Biol and extended this core idea into several readable books.

One interesting story concerns the Acheulian hand-ax manufactured from 1.5 to .3 million years ago: this is a large disk, flattened with a point, and sharpened around its entire circumference. It has no haft so is probably misnamed as an axe. Others consider it a scraper-type tool, but a major puzzle is why a tool useful for 1.2 million years would have an entire circumference sharp as it would surely injure the user's hand.

Calvin reviews work from the mid-1960s showing how it behaves as a thrown object (it lands upright). He has himself developed the theory that throwing it in a herd of animals would be a strategy for incapacitating large prey. This could have been the Frodo-like skill that started it going, with increasing increments of brain for calculations of trajectory.

New Zealand psychologist Michael Corballis criticizes Calvin, wondering why, if the throwing hypothesis holds, humans haven't developed asymmetry, like the lobster with a functional claw bigger than the other.

Corballis highlights laterality differences and suggests that "the left hemisphere of most humans—that magic carpet of tissue—may be uniquely equipped with ... a *generative assembling device."* This, he suggests, has the function of "constructing representations in generative fashion from small vocabularies of primitive units." He quotes David Marr and Irving Biederman with respect to not just the units of language but units of visual construction. He notes that "there can be little doubt of the gen-erativity of modern technology, which is relentlessly combinatorial: The same units--cogs, wheels, axles, nails...recur in an enormous variety of manufactured objects." Corballis plays down the right hemisphere.

But the recent book on this brain expansion topic that was most exciting of all for me was that of Merlin Donald entitled Origins of the Modern Mind: Three Stages in the Evolution of Culture and Cognition. Canadian psychologist Donald reviews thoroughly data and theories of brain development, including that of Corballis. He re-enfranchises the right hemisphere and emphasizes our going the apes one better in 'aping', ie, mimesis. He develops a strong argument that imitation was a well-developed platform from which language developed. Story-telling probably happened even before detailed language and may still be its primary adaptive function. Think of the simple story of a baby responding to a repetition with a smile.

Notes from Belize; Tail wags the bird

by John S Price

As before, the bird life here is a joy to contemplate. Wading birds are strung along the beach, poised in a few inches of water over the hapless fish, crabs and eels that pass them by. Further out to sea cormorants skim the waves and various gulls and terns dive bomb the fish. Behind the house there are mockingbirds and beautiful black and golden orioles. Overhead frigate birds circle, hawks hover, and the odd pelican flaps by.

There is a little bird which lives on the beach and which is remarkable for wagging its tail (up and down, not from side to side). I will tell a bit more about it because I think the wagging is interesting from the sociobiological point of view. Is the wagging a signal, and if, directed at whom? There is not much local knowledge about the bird or its wagging, and I have not been able to look it up in a book. It is brown on top and beige underneath, and it is quite difficult to tell from some other species that also live here. Each bird seems to have a strip of beach to itself, and it walks along, in a northerly direction (so the sun is behind it, presumably) and then it flies off and perches on a mango stem or post some yards off shore. I am not sure whether the ones I have been watching are male or female or both; I have not seen social interaction.

The wagging action is a repetitive raising of the tail, with a slightly irregular rhythm and a rate of about 120 per minute. From a purely rhythm point of view, it is very like atrial fibrillation (but I resisted the temptation to scatter crumbs of digoxin for them). There is also an extension of the head and neck not in phase with wagging tail, and occurring at a rate of about 40 per minute. Both these movements seem inhibited when the bird is walking. I have almost convinced myself that there is a rebound increase in the amplitude (and possibly also the frequency) of the wagging after a period in which it is inhibited by walking.

When I first saw the bird, I thought I was observing some neurological disease, a sort of avian Parkinsonism, but then I was told they all wag. No-one seems to know why. The theories are as follows:

1. It could be an adaptation for combating parasites. Since they feed on the sand, they are liable to be parasitised by sandflies (which are very numerous at times) and the wagging serves to flick the flies off—this would explain why the head and tail are both involved, in fact, between the two movements, the whole bird is flicked or twitched quite regularly, so unless the flies have some means of clinging on, it might well dislodge them. This would put the behaviour in the same category as the horse swishing its tail.

2. It could assist thermoregulation. The birds live in a hot climate and may need to keep moving to lose heat. Since their method of foraging is much less active than, say, birds which live on fish, they may need to have an extra heat-losing mechanism.

3. It has been suggested that it might be a camouflage device, although to the human eye, it makes them more conspicuous—if fact, they are so easy to see due to their movements and because of them one may well be missing other birds standing still. But it could be that to a predator(s)—unknown—the movement could make them less conspicuous.

4. In contrast to the previous idea, it could be an advertisement of some sort, either a species-recognition signal, or a courtship display, or a warning to same-sexed conspecifics. I am sympathetic to the view that it is an agonistic or threat signal, because after watching it for a while one becomes quite irritated, and if I was a conspecific I

might quite easily fly away to get away from the monotony of the rhythm.

The idea of a species-recognition signal gains credence form the the fact that there a lot of small birds with very similar appearance which seem to share the same habitat. Also, the particular ecological properties of its littoral habitat made it difficult for it to advertise itself in the usual bird way through song. The conditions of the shoreline are not favourable to high pitched sounds, which are damped or obscured by the sound of the waves and the wind. Therefore some visual signal is more likely to have evolved. Since the plumage is drab, a repetitive movement is an obvious candidate for selection.

I know there is a British bird called a wagtail—I have not knowingly seen one and I wonder if it wags its tail in the same way and for the same reason. Perhaps by the time we leave I may be able to tell you more about our little Belize wagger which I think is called the lesser sandpiper.

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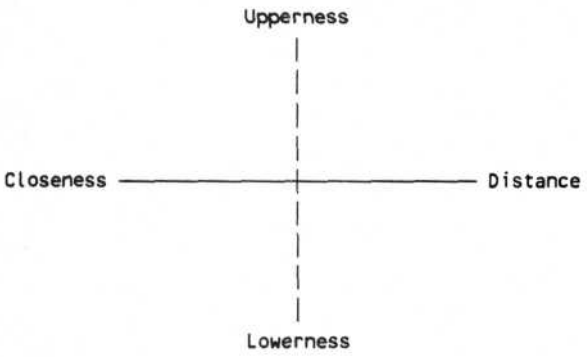
Response to Leon Sloman's appeal for a reconciliation between attachment and social rank theories in evolutionary psychiatry, by John Birtchnell

Leon refers to two ethological theories: attachment theory and social rank hierarchy theory. I agree that they often are considered to be competing models and that there should be a reconciliation. In my review of *Social Fabrics of the Mind, I* noted a preoccupation with issues of power and an almost complete absence of any reference to Bowlby, and in my review of Paul Gilbert's *Depression: The Evolution of Powerlessness* I noted that although network theory and ranking theory, and belonging and power, were referred to, much was written about ranking theory and power, but very little was said about network theory and belonging. In my book, I refer to horizontal (involvement) theorists and vertical (power) theorists and it is my opinion that people tend to be either one or the other. The theory with which the book is concerned I sometimes call spatial theory, and in spatial theory there is the reconciliation which Leon is pressing for. It describes a horizontal dimension which contrasts closeness seeking and distance seeking and a vertical dimension which contrasts upperness seeking and lowerness seeking.

*Editorial note: the following figure from the Sep, 1991 ASCAP may refresh the reader about the schema of spatial theory.*

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Whilst there are purely horizontal theories (and these are summarized in the book) I would not consider attachment theory to be one of them. Bowlby (eg 1977) always emphasized that attachment is only that which the young do to the parent. Thus although it is a form of closeness it is only closeness from below upwards, ant therefore always carries an important vertical component. Beck's (1983) useful distinction between defeat depression and deprivation being more vertical and deprivation depression more horizontal, but the theoretical background from which this distinction is derived cuts across dimensions. The autonomous per-

sonality, who is more prone to defeat depression seeks both distance and upperness and the sociotropic personality, who is more prone to deprivation depression, seeks both lowerness and closeness. Parenthetically, on the issue of autonomy, Leon states that a poor sense of self "presumably results from an insecure attachment". I would consider that self develops not in closeness but in distance, and a poor sense of self results from insecure distance, not insecure attachment.

The ranking theory model of depression, much favoured by John Price and Paul Gilbert, is exclusively a vertical theory. I would consider that it accounts for some forms of depression but certainly not all of them. It draws parallels between human interactions and the confrontations which occur between animals, but human interactions are vastly more complex than animal confrontations. Ranking theorists refer to depression as a form of behaviour, a backing down in the face of undefeatable opposition, but most human interactions are not a matter of who is going to defeat whom. Psychiatrists, and I would count myself among them, consider depression to be an affective state rather than a form of behaviour.

At the heart of my theory is the belief that both animals and humans have what I call relating needs, just as they have physiological needs. Such needs are variants of closeness, distance, upperness or lowerness, not as with the ranking theorists, just upperness. When these needs are met they feel good (elated) and when they are not met they feel bad (depressed). Leon cites Nesse as saying that "the function of low mood is to steer the individual from less to more productive activities." This comes quite close to my definition. I would say that animals and humans have appetites for various states of relatedness and it is these which stir them into activity, just as hunger and thirst do. To some extent therefore Nesse is confusing mood with appetite, but I can see what he means, and I will return to this matter shortly. Leon accuses Nesse of ignoring aggression. Aggression is a form of behaviour which enables the organism to attain certain (though not all) objectives. For carnivores it is a means of obtaining food. Leon says that high mood enables the individual to express aggression. Certainly some manics are aggressive, but some depressives (particularly men) also are aggressive. In humans, aggression appears to have been modified in the direction of anger and determination. Anger is a spontaneous, short term response to the loss or the threat of loss of a particular state of relatedness. It comes into play only if there seems a reasonable chance of defending or regaining it. If there seems not to be, it is replaced by dejection. Determination is a more long term strategy directed towards overcoming obstructions to the attainment of a particular state of relatedness.

Depression for me, is the response of humans to a failure to attain a state of relatedness, and anxiety is the response to the *danger* of a state being lost or becoming unattainable. Both depression and anxiety are forms of mental pain, which have led some people to refer to them as internal punishments. They have got to be painful to convey to the organism that all is not well. They are analogous to physical pain, and like physical pain, provoke the person into trying to rectify the situation. To this extent, I would agree with Nesse, but depression will act as a spur only if there appears to be hope of success. When hope fades, depression intensifies and the person becomes becalmed, or even suicidal. There are various ways of getting out of depression. Circumstances may change; the

behaviour of another may provide the needed state of relatedness; the person may see a way to a new source of it, for there are always many different sources; or s/he may become reconciled to not having it and seek alternative satisfactions.

Ranking theorists frequently misconstrue my vertical dimension. All too easily they slip into thinking that (1) upperness is good and lower-ness is bad and (2) loss of upperness leads to lowerness, and all too readily they draw parallels between animals and humans. In humans, lower-ness has become a growth area and one thing which distinguishes animals from humans is the vast expansion of the advantages of lowerness. Religious belief is one expression of lowerness and humans are the only animals which have religious belief. Loss of lowerness leads to depression as much as does loss of upperness. Humans use their upperness to provide lowerness for others: they lead, govern, manage, inspire, organize, plan for, assume responsibility for, protect, supply food and services to, guide, teach, give information to, approve of, praise, console, encourage, forgive, rescue, care for and treat. They do these things partly because these are ways of indulging in upperness and partly because people who are even more upper than they are (one cannot avoid this double comparative here) employ them and pay them to. Lower people look up to others receptively, appreciatively, trustingly, respectfully, adoringly.

It is an immensely important fact that because upperness and lowerness assume so many different forms, people are exchanging lowerness for upperness and upperness for lowerness all of the time and often, in a general way, rather than in any specific way. It is sometimes impossible to say who is being lower and who is being upper. One important complicating factor is money. Money may be construed as a form of packaged upperness. Like electricity in the physical world, it can be exchanged for a variety of different forms of upperness and always must enter into any kind of interpersonal equation.

The intriguing thing about states of relatedness (unlike the satisfaction of physiological needs) is that they can be attained only be interaction with another person. But, and this is important, the other person need not be (though ideally should be) a willing participant in the interaction. Depression can arise therefore not only through loss of, or failure to attain, a particular state of relatedness, but also through another imposing an unwanted state of relatedness upon the person in order to satisfy her/his own relating needs. A mother, for example, may become depressed because her child's need for lowerness may be so intense that it pushes her into closeness fatigue.

Using my terminology, ranking theorists would argue that depression results from loss of upperness, and attachment theorists would argue that it results from loss of closeness. I suspect Leon is saying is that both are true. I have tried to show that the picture is much more complex than this. Whilst it is necessary to make across-species comparisons, it is unscientific to impose the relating behaviour of animals upon that of humans without taking into account modifications of animal behaviour which have taken place in humans.

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Reply to Dan Wilson by J.S. Price

I really appreciated Dan Wilson's taking up the issue of genetic variation and frequency dependent selection (FDS) in the Jan ASCAP. It is good to get some dialogue going, rather than have one's contribution disappear into nothingness like a

splashless pebble into a pond.

We are not really interested in positive FDS (when the fitness of a phenotype increases with its frequency) because this just reduces variation. But we are very interested in negative FDS (when the fitness of a phenotype is inversely proportional to its frequency), because this can cause variation and even bimodality in a trait. So, I will use the term FDS, meaning negative FDS.

We might try making a list of instances of FDS (one could always give up if it got too long) and classify each according to whether the instance might be relevant to ASCAP. Among the irrelevant instances, priority would probably go to those concerned with predator avoidance, such as mimetic morphs in butterflies; lizards who "break" up or down a rock when a bird swoops; I expect a book on predator-avoiding strategies called Protean Behaviour gives lots of examples. What about fish which turn left when the rest of the shoal turns right? That would probably depend on whether the predator fish was geared to eating a single fish or a whole school.

Thinking of relevant possibilities, what about habitat selection? Is it more advantageous to select a fringe habitat when everyone else is crowding into the fertile valley; or a mountain habitat, when everyone else is in the plain? Is this sort of thing maintaining the variation along John Birtchnell's closeness/distance dimension (or along the introversion/extroversion dimension, whose basis is thought to be highly genetic)? And would it pay to be attracted to fishing when everyone else is mad on hunting? The same would apply to food preferences.

As you know I think the most relevant examples to psychiatry are the alternative competitive strategies, basically Maynard Smith's Hawk and Dove, which translate into escalating and de-escalating strategies or even into high self-esteem and low self-esteem strategies (both temporary as in mood change and lifelong as in personality variants along the "vertical dimension").

Then there are alternative strategies for dealing with adverse climate. Consider species in which a proportion of the population migrates or hibernates, while the remainder of the population stays at home or above ground. It must be the case that the larger the proportion which migrates or hibernates, the more it pays any one individual to try to battle through the winter fully awake on its original territory (and, or course, *vice versa*).

What about mating strategies? Does it pay more to be monogamous when everyone else is promiscuous? Does it pay to fancy redheads when the crowd prefers blondes (this would be the opposite of Fisher's runaway sexual selection)?

These examples can be seen against a background of those probably more numerous cases in which it pays to do the same as everyone else. I am sure we as human beings have a tendency to check all the time to make sure we are going along with everyone else, and not only in clothes. I can remember a patient who worked in a factory and lived about an average distance from it. Every morning he would walk or cycle to work "with the throng". then he retired and got a morning job in the opposite direction to the factory. He had to go to work every morning "against the throng". He found this very stressful, it made him feel out of step with his community. I am not saying that is why he got depressed, but it can't have helped.

In these cases, the payoff is maximal in the middle, and gets less as you approach the extremes; the result is reduced variation unless the variation is "fixed" by heterozygote advantage. If for any reason, it pays

to be nearer one extreme, you get normal directional selection; if it pays to be nearer either extreme, regardless of which, you get an increase in variation until you get bimodality and can then speak of alternative strategies and FDS.

I was amazed recently to read about alternative mammalian mothering strategies. Apparently some rabbit mothers keep their litter in a separate nest, which they only visit once every 24 hours. And tree-shrews are even more extreme, only visiting their young once in 48 hours. Are they good or bad mothers? Certainly, John Bowlby might raise an eyebrow at them. And what about captive rabbits who are forced to share a cage with their litter: is this stressful for them? Does their hypothalamic-pituitary-adrenal activity increase?

The function of this apparent neglect is thought to be the avoidance of predators, in that the predator finds it easier to locate the young when the mother is in the nest, or when the mother is going to or from the nest. I am not absolutely sure whether this variation ij? mothering occurs within species or only between species. Russ, what sort of gene, or protein, could keep a mother from her offspring for forty-eight hours at a stretch? (I imagine the genetic basis of the variation has not been worked out, if it occurs within species, or the authors would have said; it could be a single gene, or polygenic with a threshold).

Regarding the distinction made recently in ASCAP between those who look at woods, trees and leaves, I am a leaf man myself. I would like to have discovered chlorophyll, or the fact that some leaves fall off in winter when others don't. Likewise with diagnoses. I would rather get the MRA people to examine a population of soloists after receiving standing ovations, and compare them with a population who have received cat-calls, and get to grips with the physiology of receiving boosting signals (anathesis, but I have rather given up trying to get people to use this terminology) and putting-down (catathetic) signals. It already seems likely from MT McGuire's work that the applauded soloists would have high platelet 5HT, and from a lot of studies that the booed ones would have high blood cortisol (assuming hedonic anathetic signals evolved from agonic anathetic signals [submissive signals] and the same for the agonic catathetic signal of booing) . What and where is going on in the brain? I think the biggest difference would be found in Roman generals having a triumph through the streets of Rome, but even in Roman times that (eg, the venipuncture) might have been hard to set up.

What was the physiological status of that tribal elder (reported somewhere in the anthropological literature) who farted during a solemn ceremony, got up and went and committed suicide by impaling himself through the anus onto the top of a pointed tree? He did not even receive catathesis, he only anticipated it (or got it from an internalized other). Back to trees, you see, it pays to stick to the point.

A final thought. We know there are two major dimensions of variation in human behaviour: extroversion/ introversion and neuroticism/stability. How is this variation maintained? The two main possibilities are hetero-zygote advantage (at one or many gene loci) and frequency dependent selection (also at one or many loci). How can we tell the difference between them? I think for this problem we need a mathematical expert like Lin-don Eaves, who when I was working in genetics was trying to detect directional selection for extroversion, and his equations were something else. I think it is true to say that heterosis predicts unimodality where-

as frequency dependent selection predicts bimodality of the distribution of some underlying trait. People think you only get bimodality with single genes, but you also get it with FDS, even when the genetic basis is polygenic. The possibility of FDS makes it worth looking for bimodality even in a trait which seems sure to be polygenic.

It is sometimes said that the nineteenth century novelists were the first psychologists, forerunners of Wundt, and able to deal with more fundamental issues than Wundt was able to in his laboratory. Thackeray gave an interesting adumbration of Maynard Smith's Hawk and Dove strategies in The History of Henry Esmond;[20]

'Tis nature hath fashioned some for ambition and opinion, as it hath formed others for obedience and gentle submission. The leopard follow his nature as the lamb does, and acts after leopard law; she can neither help her beauty, nor her courage, nor her cruelty; not a single spot on her shining coat; nor the conquering spirit which impels her; nor the shot which brings her down. (This was in reference to Beatrix Esmond's proud reaction to the Duke of Hamilton's death just before their wedding.)

A similar view comes from Henry Kissinger in the Necessity for Choice;

The real distinction is between those who adapt their purposes to reality and those who seem to mould reality to the light of their purposes.

I have a similar quote by Philip Roth on my file in England. These quotations and the theoretical work of Maynard Smith and his colleagues give us a challenge to look for bimodality in the "vertical dimension."

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I recall reading about the infrequent visits of the rabbit mothers and witnessed one such who made a nest outside the picture window in a house in which I previous lived. The infrequent visits are for predator-protection and I believe her milk is correspondingly richer (will those lipids do for your aboverequest for molecules?) Perhaps what the little ones miss in maternal concern they make up in viability (they *need* good hiding places). Perhaps also the little rabbits get a great deal from each other! I am reminded of M Erickson's AJP article telling us that familial bonding applies to siblings.[21]

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A Formulation of the Evolutionary Aspects of Depression by Aaron T Beck

1. In order to carry out evolutionary imperatives, a person requires resources (supplies).

The imperatives consist essentially of survival and reproduction. The resources are either internal (energy, skills, mobility, knowledge, strength, etc) or external (food, protection, support system, etc).

2. The individuals' perception of their personal attributes and internal resources constitute the self-concept. Their evaluation of these attributes and internal resources represent their self-esteem.

3. The representation of their external resources (support system, friends, healers, etc) equals their domain.

4. Short-term safety utilizes the danger/threat principle (anxiety/anger).

Short-term resource development depends upon the pleasure-pain mechanism. Pleasure at increasing resources, for example, food-energy, bonding; or pain at losing resource (deprivation, rejection).

5. Long-term survival depends upon a prevailing positive balance (or at least an equilibrium) between supply (resources) and demand (output).

Thus, a conservation principle is operational in order to maintain a balance.

6. The positive balance is upset by increased demands (for example, parenting) and/or decreased support (for example, withdrawal of spouse;

loss of parent or sibling). Similarly, in the achievement-oriented goals, the positive balance could be upset by an increase in administrative obligations and a decrease in staff.

7. The consequence of the percep tion of continuing imbalance leads to a belief in the risk of total deple tion of the resources.

8. Depression works in a compli cated way to force conservation of energy by reducing demands or goals and limiting activity.

9. The processing of the loss at taches meanings to an event in terms of self-concept and expectations. For example, the self-concept switches to "I am helpless/ unlovable." The future concept or ex pectancy is "I can never do or get what I want."

10. Self-criticism is probably redundant in depression since the patient already perceives self as un lovable or helpless. Normally, self-criticism is paired with self-devaluation as a way of prodding change in strategy or goals.

11. Dysphoria is a way of undermin ing the pursuit of any goal that in volves expenditure of energy.

12. Anorexia and loss of libido dis courage foraging for food and inter est in sexual mating.

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More on Learned Helplessness and Leks

by Mike Waller

I found the Feb Newsletter more than usually stimulating and tantalizing. The RG and Leon Sloman contributions were particular rich in these qualities. Reading them, it seems to my less than impartial eye that you both come to the brink and then retreat. Leon pays due reference to Aaron Becks's "conservation of energy" model of depression and Randolph Nesse's notion of it as the negative side of a "carrot and stick" incentive system, yet seems sure that this cannot be full story. RG seems to want ruthlessly to pursue the question of the evolutionary function of "learned helplessness" (LH), but then sheer off into consideration of its compatibilities, or otherwise, with ranking theory. This latter issue you describe as "the central idea". Surely the central idea with LH is the question of how such a devastat-ingly disadvantageous piece of behaviour could become, as Paul Gilbert suggests, a basic plan?

Our understanding of LH and our everyday observation of chronic depression and its effects tell us that something pretty incompatible with the idea of evolutionary survival is going on. Consider, for example, the following case taken from a recent programme, shown on UK television, dealing with the health implications of the present recession. One of the subjects was a married man with four children who had mortgaged himself to the hilt to expand his business during the late 1980s. The present economic crisis had caught him and his business. According to his wife, he had been an excellent husband and father. Now he had lost interest in her, had little time for his children and was particularly antagonistic towards his eldest son. Much of his time seemed to be spent endlessly pouring over figures he could not change. His doctor was shocked at the dramatic deterioration in his mental and physical health, and went on to make the general point that the National Health service would be paying for the psycho-physical consequences of economic failure for years to come.

From an ASCAP perspective, it seems to me that there are three key features of this type of behaviour. First it seems directly analogous to learned helplessness. Second, it is so widespread that, if it could be seen as in anyway giving adaptive advantage, there would be little dif-

ficulty in accepting it as a product of evolution. Third, far from giving adaptive advantage, it seems to be specifically designed to eliminate genes from the gene pool. What else is likely to be the result of loss of libido, a breakdown in health, and behaviour damaging to the self-confidence of the next generation?

Nor, as you well know, is this an exceptional case. This is William Glasser describing one of his patients: ".. he felt that he could not face another day. Things were barely real to him, every movement was an effort; he just wanted to stop functioning completely.... He had no energy, no desire even to eat. He wanted to fade into oblivion. He felt that nobody could possibly respect him, that he was of no value to himself or anyone else".[22]

Again, as I write, I am haunted by the staring eyes of a young boy, seen two nights ago in a programme dealing with anorexia nervosa. He had already once brought himself within days of death by starvation. Typically lacking in self-esteem, he was asked why he thought himself to be worthless. "I do not think I am worthless, I am worthless, it's an objective fact".

Perhaps fairly routine stuff for those of you who deal with it on a day by day basis, but to a greenhorn like me it is pretty devastating.

Trying to explain this type of phenomenon in terms of a usually beneficial basic plan which has gone ever so slightly awry, seems to me to do justice neither to the facts or the human problems they cause. Something is "intentionally" driving these people to destruction and it is evolutionary biology's task to accommodate its theories to this fact rather than vice versa. The present position seems to me to be analogous to a detective who has an absolute conviction that doctors will invariably act in the best interests of their patients. Called upon to investigate a case in which a deranged doctor was shot by a particularly troublesome patient, he ignores what is self-evident and struggles relentlessly to explain what has happened in terms of a tragic accident with a legitimate form of treatment requiring the high speed entry of slug of lead into the cranium.

As I used to tell people in management decision-making courses, problem-solving with this type of a *priori* assumption leads to some pretty imaginative solutions but very rarely the right answer.

As to how neo-Darwinist natural selection theories can be adapted to accommodate the idea of our each carrying the potential for self-destruction, I would refer anybody interested to earlier ASCAP numbers where I discussed my belief in the existence of a comparator mechanism.

Russell, may I tilt at the same windmill from a different direction? When considering yielding strategies in relation to psalics you speak of the emphasis being on conspecifics on the basis that "yielding doesn't work with predators—nor with outgroups for that matter"...

In my boyhood there was a philosopher (Joad) who was famous for starting his answers to a wide range of questions with the phrase "It all depends what you mean by..." This seems to me a useful way of unpacking what you are saying, ie, what does "work" mean in this context?

Certainly, showing yielding behaviour to predators or outgroups does not work in the sense of assisting in survival and reproduction; but it does not follow from this that it does not happen. Indeed the reverse appears to be the case. How else can we explain the commonplace that both the predator and the rest of the herd seem to know which of their number is likely to be the victim? I seem to recall that twenty years ago there was a branch of the social sciences

known, at least coloquially, as vic-timology. My recollection is that it was built on pretty hard evidence that certain individuals attracted so much harsh treatment at the hands of others that this could only be explained in terms of their actively seeking it out and somehow signaling their vulnerability.

The quality of "always being the one who is picked on" is not something the picker imposes on the picked; it is a property of the latter. It is something which, in my view, has a clear evolutionary function. It "works" by causing those who, rightly or wrongly, come to consider themselves as the least worthy of passing on the common genes which define the reaction, to act in ways conducive to their own destruction or, at least, temporary marginalisa-tion. They are not conscious of what they are doing. They might merely be aware of being swept by a feeling of hopelessness, no doubt reflected in their faces and general deportment; that their legs are turning to jelly; and that they are sweating profusely. However, much as it grieves me as a human being to say so, I am convinced they have become locked into a psalic specifically shaped by natural selection: a predator/bully attractant.

Response to leks discussion: I felt that John (Price) was not entirely accurate in assuming a low level of sexual activity following village hops. I am not, alas, speaking from personal experience but I am reminded of Dorothy Parker's speculation about a much more prestigious social event at a major female educational institution. As I recall it she said that if, when the ball was over, all the young ladies "were laid end to end, I should not be at all surprised". My supposition would be that reality lies somewhere along the Price/Parker continuum and that the village hop parallels the lek to a very considerable extent. The brothel on the other hand is no more than a human contrivance which "cheats" natural selection by giving the male the reward of pleasurable sex without his usually delivering the genetic goods. Certainly, these days techno-social phenomena such as contraception and money are sine qua non. Regarding the women, their widely reported hatred of men and (I think) high rate of suicide and self-abuse suggests that the self-destruct mechanism in which I am so interested, plays a not insignificant part.

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Mark Erickson in his article on incest suggests that familial bonding may occur with non-relatives if they live together when young. Hence two unrelated oppositely sexed people may not mate because they experience incest taboos. Has the selfish gene been fooled here? Devices naturally selected for sometimes misfire.

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Abstract: Jones IL, Hunter FM: Mutual sexual selection in a monogamous seabird. Nature 1993;362:238-239 (18 Mar 93)

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

Abstract; Marchetti K: Dark habitats and bright birds illustrate the role of the species divergence. Nature 1993/362:149-152 (11 Mar 93).

Animals exhibit a diversity of colour patterns that are commonly used in interspecific and intraspecific communication. Factors influencing the evolution of signals used in communication include the properties of the physical environment in which the signal is generated, the perceptual systems of individuals (such as potential mates or predators) receiving the signal, and the nature of the information signaled. In warblers of the genus Phylloscopus, species differences in colour patterns are correlated with light intensity of the habitat: brighter species live in dark habitats. I report here two observations that colour patterns function to increase conspicuousness, and are used in intraspecific communication. First, individuals make themselves temporarily more conspicuous by flashing the bright colour in display,and are less conspicuous when not displaying. Second, experimentally increasing conspicuous males within a given habitat increases territory size, whereas experimentally reducing conspicuousness results in either a smaller territory or its total loss. Traits used in intraspecific communication are often thought to diverge as a result of variation in perceptual systems. This study shows that variation of the physical environment can cause species divergence,and this will occur whether perceptual systems are variable or relatively constant.

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Abstract: Gaulin SJC: Evolution of sex differences in spatial ability. Yearbook of Physical Anthropology 1992;35:125-151.

Many sex differences are likely to be adaptive consequences of sexual selection. Sex differences in spatial ability are well described for Homo sapiens and laboratory rodents, and such cognitive traits may also be shaped by sexual selection. An evolutionary model is outlined to predict the distribution of those sex differences across species. Sex differences in spatial ability were previously believed...universal among mammals, but the evolutionary model has correctly predicted that such differences will evolve only in species where mobility has different effects on male and female fitness.

Wild microtine rodents are particularly useful for testing this model. Radiotelemetric data from field studies of ranging behavior, data from laboratory studies of maze learning, and neuroanatomical data on the hippocampus, a struc ture believed to be critically involved in spatial processing, all support the model. Several alterna tive explanations for sex differences in spatial ability are reviewed and evaluated. The proximate developmental basis of these sex differences is dis cussed and an attempt is made to integrate develop mental and evolutionary perspectives ____

Abstract and selected quotes: Green P, Lipman D, Hillier LD, Waterston R, States D, Claverie J-M: Ancient con-servered regions in new gene sequences and the protein databases. Science 1993;259:1171-1716(19 Mar 93) Abstract. Sets of new gene sequences from human, nematode, and yeast were compared with each other and with a set of Escherichia coli genes in order to detect ancient evolutionarily conserved regions (ACRs) in the encoded proteins. Nearly all the ACRs so identified were found to be homologous to sequences in the protein databases. This suggests that currently known proteins may already include representatives of most ACRs and that new sequences not similar to any database sequence are unlikely to contain ACRs. Preliminary analyses indicate that moderately expressed genes may be more likely to contain ACRs than rarely expressed genes. It is estimated that there are fewer than 900 ACRs in all. First paragraph. Understanding the functions and structures of the array of proteins expressed in living organisms is a fundamental goal of molecular biology. Our hope of attaining this goal stems largely from the unifying theme of shared evolutionary ancestry: related organisms have similar proteins and within an organism, different proteins of related function are often wholly or partly similar in sequence, reflecting gene duplication and exon shuffling during evolution. Such similarities can provide important functional insights, and consequently an important step in characterizing any newly sequenced gene is to compare its encoded protein sequence with the protein sequence databases in order to look for conserved regions shared with known proteins. Later sentence. The present study involves ACRs that antedate the radiation of the major animal phyla [some 580 to 540 million years ago] and that are present in diverse eukaryotes.

1. Quoted in Hall SS: Old school ties: Watson, Crick, and 40 years of DNA. Science 1993,-259:1533 (12 Mar issue)

2. c/o R Gardner, 1.200 Graves Building (D28), University of Texas Medical Branch, Galveston, TX 77555-0428. FAX: 409-772-4288. For ASCAP Newsletter Volumes 3 (Jan through Dec, 1990), 4 (same months, 1991), and 5 (same months, 1992), please send $18 (or equivalent) for each 12 issue set. The first two volumes (1988 and 1989) of thirteen and twelve issues respectively are available on request without cost. For subscription to the 1993 set of 12 issues (Volume 6), the cost is $20/year. Make checks or money orders out to "Department of Psychiatry and Behavioral Sciences, UTMB."

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Past-President: Michael R A Chance At this time this "informal" organization has no

official budget.

4. Yale University Press. 1991. (526 pages) I.S.B.N. 0-300-04911-0.

5. Eiseley L: The Immense Journey. NY: Random House, 1957, p 86.

6. Hrdy SB, Whitten PL: Patterning of sexual activity. In Smuts BB, Cheney DL# Seyfarth RM, Wrangham RW, Struhsaker TT: Primate Societies. Chicago, IL: University of Chicago Press, 1987, pp 370-384.

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8. Diamond, p141

9. a. Calvin WH: How the Shaman Stole the Moon: In Search of Ancient Prophet-Scientists from Stonehenge to the Grand Canyon. NY: Bantam, 1991.
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10. Goodall J: The Chimpanzees of Gombe: Patterns of Behavior. Cambridge, MA: Harvard U Press, 1986, p. 69. "Hugo ... seized a stone and hurled it at me! Hugo was, in fact, one of Gombe's few habitual stone throwers." p. 70: "Humphrey was ... aggressive to human females, frequently hurling quite large rocks at us, with uncomfortably good aim."

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13. Corballis, p238.

14. Donald M: Origins of the Modern Mind: Three Stages in the Evolution of Culture and Cognition. Cambridge, MA: Harvard U Press, 1991.

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19. Manning A, Dawkins MS: Animal Behaviour 4th Edition. Cambridge: Cambridge University Press, 1992

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21. Erickson MT: Rethinking Oedipus: An evolutionary perspective of incest avoidance. American Journal of Psychiatry 1993;150:411-416.

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