ASCAP NEWSLETTER

Across-Species Comparisons And Psychiatry Newsletter
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"...we should appreciate the "helpless opportunism" of all science, awaiting the right tools, discovery or concepts which which to pursue, "frame," and tell a completed story." Daniel X. Freedman[1]

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.

Features; This issue features a long version of M Waller's thinking on psycho-Darwinism. Another variant of a short version in the July issue of ASCAP was seen in the pages of Nature , after which a spirited letter exchange occurred , including but another ASCAP reader/writer who writes for Nature. C Badcock.. p 2
At MW's request, I respond.. p 11
Mike will rebut later of course. We hope others will also respond.

Book Announcement; Giving the Body Its Due; Interdisciplinary Challenges to a Cartesian Metaphysics (Ed.) Maxine Sheets-Johnstone. NY: State University of New York Press, forthcoming, 1992. From the promotional material: This gathering of essays brings together interdisciplinary understandings of what it is to be the bodies we are. In its own way, each essay calls into question culturally-embedded ways of of valuing the body which deride or ignore its role in makingus human. These ways have remained virtually unchanged since Descartes in the seventeenth century first sharply divided mind--a thinking substance--from body--an extended substance.

Contents include essays by M Sheets-Johnstone, AA Johnstone, S Nagatomo, D Moerman, P Levine, R Kugelman, RD Romanshyn, M Goldfarb, E Gendlin, and ML Foster.

Letters: August *12, 1991*

. . .I do include a copy of my recent letter to Nature in reply to Waller.[5a] *...Dawkins was right, of course, but as usual more concerned with the finer points of Darwinian theory than its application to human behavior....*

I was glad that you had got the copy of my new book, and flattered that you actually thought it worth reading. Would it be possible to give it a mention in the Newsletter, given that, in many ways, it is a book written for the ASCAP reader, and you have already been kind enough to publish a short abstract of it.

C Badcock, London Sch of Economics

The book mentioned, Evolution and Individual Behavior: An Introduction to Human Sociobiology (Basil Blackwell, 1991), is written in your usual highly readable style and has become an important resource as I write a chapter on sociobiology and its application to psychiatry for a text on psychiatry. One of your meaningful contributions is how you blend psychoanalytic theory with the new findings and concepts of population-based sociobiology.

The chapter headings are:

Introduction: Darwin's difficulties
- Historical set-backs
- Genetic puzzles
- Fallacies of fitness
- The problem of altruism

1. The evolution of cooperation
- Prisoner's dilemma
- Computing cooperation
- The rewards of reciprocity
- The solution to the problem of altruism

2. Three kinds of cooperation
- Kin altruism
- "Kin selection" confusions
- Reciprocal altruism
- Induced altruism

3. Evolution, cooperation, and human nature
- The issue of free will
- The question of consciousness
- **A**ltruism and identification
- The biology of morality

4. Male behavior and misbehavior
- The fundamental factor
- Four forms of the family
- Sex and violence
- Cryptic violence

5. Sex and female interests
- Abortion, fat, and fertility
- Sex and female choice
- Secrets of the sexual cycle
- Mysteries of menstruation

6. Family, sex, conflict, and cooperation
- Parent-child conflict
- Conflicts that kill
- Problems of paternity
- The infant strikes back

7. Freudian findings
- Parental investment and oedipal behavior
- Penis envy and parental influence
- The prime role of the father
- Oedipal effects in adult life

Conclusion: The nature of culture
- Culture as a problem of scale
- Three cultures of cooperation
- Culture, conflict, and parental investment
- The gene-culture interface

Letters: (Cont.) *September 7, 1991*

...There are no "shallows" to the Newsletters: one is immediately over one's head and has to swim fast to keep up with the already entrenched currents/counter-currents of conversation! (A little like coming into the theatre half-way through a highly animated play.) But I enjoyed getting a sense of the Newsletter's focus and topics.

...At *some point, I'd appreciate a clarification of "top-down" and "bottom-up." I can't tell if you mean "top-down" is equivalent to "logically derived" ... or whether it is equivalent to intuition....*

Maxine Sheets-Johnstone, U Oregon

Top-down vs bottom-up distinctions refer to scientific investigations that attempt linkages between the or-

ganismal (top) and cellular-molecular (bottom) levels of investigation.

Thus, Price, Sloman (and Waller in this issue) are interested in depression, losing reactions, and negative comparison perceptions. Are there ways of characterizing these organismal states through variations of some bodily substance, or activation of a neural circuit? This would be a "top" constellation of behaviors looking "down" to their molecular and cellular counterparts.

I have been excited by two mental retardation conditions caused by a deletion in a particular chromosome (long arm of #15) because they have distinctive mental and communicative stereotypies that are presumably influenced by the absent genes. These are preoccupation with food, lack of speech, and inappropriate laughter. With this clue, the analysis of the behavior can start with at least locating some distinctive genetic alterations, going from the top (the stereotyped mental and communicational states) to the bottom (the DNA sequence at a particular part of the genome). The natural experiment of the mental retardation syndromes allows a focusing in on the cell's nucleus. Instead of a country viewed from a satellite, it's a state.

In a sociology text displayed at the HBES conference, a box occupying a three-quarter page (of about 400 total pages) dismissed "sociobiology" because so far there is no particular gene connected with a specific behavior. I believe the author thereby asks for top-down evidence. This criterion for taking sociobiology seriously is thereby coming nearer.

An example of how the opposite (bottom-up) operates is in recent experiments in which constructed genes (DNA strands) or proteins are injected into experimental animals. For instance, currently the gene for amyloid precursor protein which gives rise to a substance potentially harmful to patients with Alzheimer's disease has been injected into the eggs of mice, making these when older "transgenic" mice . Preliminary evidence from one group doing this shows the same brain structures affected in humans are affected in the mice. The molecule from the bottom is affecting a nervous system intermediary on the way up. Now mouse memory is being assessed for an even higher correlate.

Another example: the 25 Oct, 1991, issue of Science tells how analysis of nitrogen-15 and carbon-13 levels in bone collagen of a 40,000 year old Neanderthal man have provided insights about his diet. Meat eaters have more N^{15} than herbivores and C^{13} changes with marine food items. This was a bottom-up analysis because molecular evaluation told about eating behaviors. (Conclusion? he ate meat far from the seashore.)

Letters: *(cont.) September 10th, 1991*

I really enjoyed the HBES meeting. Meeting Ellen Dissanayake was a special reward. I got a clear sense of my own mission, which is the integration of diverse knowledge into evolutionary psychology. The net needs go very wide; no standard academic discipline takes on the job of attending to the full spectrum of human sciences knowledge. The trick is getting informed without getting bogged down. For example, journals like Science and Nature are fine, but technical neuroscience journals are over my head and I don't benefit.

Kalman Glantz was after Price and Sloman to not ignore other dimensions, such as attachment. He seemed to get their attention. So we may get better integrated thinking. (Beware of committing EO Wilson's epigenetic sins: black and white thinking, lack of integrated assessment.)

I really feel good about how this is developing.

John Pearce, Cambridge, MA, U.S.A.

Solving Dr. Price's Enigma: An Introduction to Psycho-Darwinism

by MJC Waller

In an article published in the July 29, 1967 issue of The Lancet, John Price asked the following question: States of excessive depression, anxiety, and irritability are very common. Possibly one in seven of the population consult their general practitioners every year for some emotional disturbance. Why should this be so? We are the result of a process of natural selection, the length and ruthlessness of which confound the imagination. It is known that the severer mental disorders are associated with a reduced fertility, and it is more than likely that under primitive conditions even the milder states of depression conferred a disadvantage in the struggle for survival. Why then are we are a species lumbered with these most disagreeable tendencies - why are we all not paragons of calm, energetic happiness?

Although I have only become aware of Dr Price's work within the past months, I have been interested in what I now call 'Dr Price's enigma' since 1978. My point of entry was open systems theory which during 1960's and 70's was widely regarded as able to offer powerful insights, drawn from the life sciences, into my then area of specialist interest, organisation theory. Open systems theory led to evolutionary theory and in particular, the concept of the selfish gene.

However, whilst I found the basic Darwinian argument compelling, I had serious difficulty with the notion, central to orthodox neo-Darwinism, of the body as a ruthless survival machine. It seemed to me impossible to square this with well established patterns of human behaviour, clearly disadvantageous in terms of natural selection, many of which appear to have an autonomic, and therefore biological, basis.

As the above quotation shows, the same issue was (and still is) of great interest to Dr Price. He has been able to identify the evolutionary advantages conferred on the winner in intra-sexual competitions where the loser is made rapidly to admit defeat by a disabling emotional reaction. But he has recognised that it is far harder to explain why the losers, and hence the genes bestowing the reaction, were not selected out. In some instances, explanations based on the principle of "he who fights and runs away ..." offer a partial answer, but these cannot encompass, for example, conditions such as chronic or manic depression, the effects of which are wholly negative.

Recent work revealing autonomic mechanisms triggered by stress, which can lead to reductions in the effectiveness of the immune system and in some cases sudden death in both humans and animals, now makes it even harder to sustain the "must benefit the bearer" line of argument.

Although I have a strong interest in the clinical dimension of Dr. Price's work, my own frame of reference in independently addressing the question he raised was that of extensive practical and theoretical knowledge of staff selection techniques used in industry. However, in explaining the answer I have come up with, I find it easiest to commence with an analogy which might well be seen as the mid point between staff and natural selection: stockbreeding.

Stockbreeding vs Natural Selection

In describing natural selection, parallels are often drawn with stockbreeding, and then qualified by noting the much greater speed with which the stockbreeder achieves results. To illustrate the difference, we might imagine two initially identical groups of organisms, significantly, but not fatally, maladapted to a new environment. If one group is left to evolve naturally and the other is culled selectively by human agents, the ascendancy of the latter would be virtually certain, and a major factor would be the ability of the stockbreeder to dis-

criminate finely between individuals and thus optimise the cull. Blind chance, variation, and marginal advantage could never do more than crudely approximate this process.

This illustration serves to demonstrate the extent to which speed of adaptation itself confers competitive advantage. In the long term, and left to its own devices, the 'natural' group would almost certainly become the more finely turned as a result of being shaped directly by environmental pressures, rather than a third party's interpretation of them. But in competition with the 'artificial' group, it would never get the opportunity, being squeezed out long before the fine tuning stage was reached. In General Patton's terms, victory goes to he 'who gets there the fastest with the mostest'.

The critical importance of adapting more rapidly than competitors underpins the following axiom:

If there were any way in which the direct, purposeful, intervention of the stockbreeder could be mimicked in nature, the processes of natural selection would lead to the mechanism becoming general within any species capable of developing it.

The Comparator Gene

There is at least one way in which some of the benefits of purposeful third party intervention in the selection process could be secured in the natural world. Less objective, systematic, and effective than the stockbreeder, it is still a major improvement on chance alone. The key element is a simple three-step mechanism.

The first step requires the existence of a 'comparator gene' (or, more properly, 'genetically programmed behaviour'), which impels those who carry it to self-assess themselves in terms of relative performance within a peer group, or on the basis of parental responses.

The next step is a linkage between the results of these self-assessments and emotional state, with high self-assessments engendering a sense of emotional well-being, low self-assessments the reverse.

The final step is for emotional state to become a determinant of physical well-being. Evidence that the second link actually exists has been accumulating rapidly over the past decade, particularly amongst humans. For example, a positive emotional state is now known to have a positive effect upon the immune system and a negative emotional state, the reverse. Increasing evidence exists that a range of illnesses, including heart disease and some forms of cancer, are related to periods of unresolved stress. Prolonged stress is also recognised as a major factor in depression, impotence, sudden death syndrome, and self-destructive behaviour, including suicide.

Thus, if self-defined comparatively successful performers derive a sense of well-being from an awareness of this success, the effectiveness of their immune systems will be enhanced and, consequently, their prospects of survival. More significantly, the reverse will apply to individuals who define themselves as comparatively unsuccessful.

Enhanced/reduced muscle tone, or increased/decreased sexual drives and attractiveness, and the widely reported 'smell' of fear, are other physical qualities which, with a similar linkage, would go a considerable way towards mimicking the stockbreeder by stacking the odds in favour of the relatively successful.

Most important, the mechanism would operate even if, objectively, the margin of advantage was small and the attributes of the less successful more than adequate to meet the practical requirements of self-replication.

Individual perceptions not a group mind

It must be stressed that this mechanism does not call for members of a species to share somehow a common perception of their 'perfect' form against which they individually

make judgments as to their personal merits. There can be no such abstract yardstick. The process proposed operates solely on the basis of individual, and entirely subjective, assessments of relative performance. As a result, potentially successful individuals may be eliminated because they under-estimate their own abilities, or over-estimate those of others. However, this itself is functional to the extent that it eliminates defective 'comparator' genes from the wider gene pool, and overall the effects of the mechanism will represent a marked improvement on those arising from an unmodified interaction of marginal advantage and chance.

The Emergence of the Comparator Gene

Some indication of the effect this mechanism would have on natural selection can be gained by imagining the point at which it first appears within a given population. Three cases can be considered:

Case 1: The bearer lacks the capacity to perform at the level necessary to avoid emotional distress.

The most likely outcome would be an early death, but in some cases escape might be attained by shifting into a different environmental niche where, initially, comparisons would not be relevant, eg, adopting a complementary social role, selecting a different food source, or colonising new territory.

Case 2: The bearer is of average potential.

With one such individual existing alongside others who are indifferent to their relative performance, the need to succeed in relative as well as absolute terms would act as a spur and be reflected, *inter alia,* in an exceptional exploitation of reproductive opportunities.

Case 3: The bearer has above average potential.

Any individual with the comparator gene plus some other variation conferring advantage, no matter how marginal, would be bound to exploit the latter more rigorously than comparable organisms not concerned with relative performance. Again, this exploitation would extend to reproductive opportunities and would result in a disproportionate rate of transfer both for the comparator gene, and the advantageous gene with which it was associated.

Given cases 2 and 3, it can reasonably be suggested that in a sexual reproducing species, whichever gender the comparator gene first appeared in, in the next generation it would almost certainly manifest itself in both. Thereafter, since a disproportionate number of those bearing the gene would be high achievers, and therefore inclined to seek out high achievers as partners, it would become universal with extraordinary rapidity.

Nor would its effects be lost once it has become general. With every member of the group instinctively aware of the vital importance of succeeding in relative as well as absolute terms, the imperative to compete, complement, diverge or die, would act as a continual stimulus to the comprehensive exploitation of any advantage no matter how marginal, the development of social behaviour, the rapid adoption of novel patterns of behaviour culminating in speciation, and the elimination of those to whom none of these options offered an avenue of escape.

Reconciling the comparator gene with the selfish gene

At first sight, the self-sacrificial element of this proposal seems totally at variance with the 'selfish gene' thesis central to orthodox neo-Darwinism. This assumes that life forms (and behaviour) shaped by evolutionary processes can have no other function than the survival of the genes they carry.

However, there is one set of genes

in addition to those of the winners', which unquestionably benefits from the three stage mechanism; those of an ancestor common to both winners and losers. This fact is central to reconciling the comparator and selfish genes. J Price has recently termed this element of my work 'ancestral gene theory' and I believe its importance lies in its ability to break the stranglehold of bearer-centricity without retreating into the nonsense of group selection. It is not offered as an alternative to William Hamilton's concept of inclusive fitness, but' instead provides a means of applying this idea far more widely than ju!3t in the context of intimate kinship.

The key difference is that, instead of figuratively standing behind an individual and asking; "what will he/she have to do to maximise his/her genetic input into the next generation?", ancestral gene theory, looking back from the present over aeons of evolutionary development, asks: "what did he/she do way back there to have the result that his/her genes got through, whereas those of countless millions, did not?"

Although orthodox neo-Darwinists would say that only the first question is useful, I believe that the comparator gene provides a valid answer to the second, on the basis that any individual deploying it in competition with others working solely in accordance with the traditional version of natural selection, would be almost guaranteed genetic supremacy.

Instead of leaving each heir to do its best to get its genes through to the next generation, the whole process is orchestrated in the interests of the primogenitor. As it is to the obvious advantage of the primogenitor's genes that the best fitted in every generation should go forward genetically to the next, they are given the urge and capability to achieve this. Others, less well fitted, may be motivated to undertake a social role supportive of the best fitted, or to carry primogenitor's genetic banner into new territories or new lifestyles.

But with those who continually assess themselves as relative failures, primogenitor's interests are most likely to lie in their becoming part of the predator's cull, thus maintaining the predator's capacity to hone the breeding stock whilst removing sub-optimal genes from the pool. It will therefore be the legs of these self-judged failures which turn to jelly under pressure; it will be their chests which start to constrict breathing; it will be they who signal weakness by failing to "jink" to the required standard; and it will be they who experience that all-pervading lethargy which seems to welcome death.

I am not, of course, suggesting that some cunning little primogenitor sat in the primeval soup and worked all this out. That would be as unrealistic as suggesting that an individual with a small patch of skin marginally sensitive to light, preconceived the eye. However, the mechanism I am suggesting is by no means complex and could quite feasibly develop by incremental stages. Its existence is simply posited on the premise that:

- as there is nothing to prevent its coming into existence at some stage during the evolutionary process, it almost certainly has;
- having come into existence, its evolutionary benefits are such as to virtually ensure that it would rapidly become widespread, if not universal.

One apparent difficulty is that, superficially, psycho-Darwinism gives some respite to that *bete noir* of modern biology, group selection theories, i.e. theories which view the individual as 'a pawn in the

game, to be sacrificed when the greater interest of the species as a whole requires it'[8].

In The Selfish Gene. Richard Dawkins demolishes the conventional type of group selection theory by pointing out that, since altruistic individuals will tend by definition to be eliminated more rapidly than their selfish peer 'after several generations of this natural selection, the "altruistic group" will be overrun by selfish individuals, and will be indistinguishable from the selfish group'[8].

However, the comparator gene escapes such criticism because it differs from traditional theories in two key areas. First, the beneficiary of its altruism is not the species as a generality, but the set of genes borne by the common ancestor. Second, it does not create some individuals who are altruistic and others who are selfish. Each individual carries within itself the biological equivalent of a control panel, with options ranging from 'supercharged self-interest' through various shades of altruism, culminating in self-elimination. But in every case, the option selected is finally determined by self-assessed comparative achievement, not genetic predisposition.

Medical Evidence

In October 1988, the UK medical journal, The Lancet, published an article[9] (which I have very recently learned was written by John Price), reviewing the latest developments in self-esteem research. The following paragraphs are particularly germane to the argument put forward in this paper as they support the existence of the mechanism proposed:

> The notion of self-esteem arises because we tend to estimate the value of other individuals and ourselves. People may have a good, middling or bad opinion of themselves - rather surprisingly, these are global evaluations. We may indeed have opinions of our capacity at cricket, and at maths, and at doing the cha-cha, but we also have a global opinion of our general worth. Another surprising thing about self-esteem is the enormous range of variation between individuals, which is immeasurably greater than the range of variation that a single individual undergoes from time to time.[11] Some people think that the whole world is their oyster; others feel they have no right to exist.
>
> and
>
> The concept of self-esteem is interesting to medicine because low self-esteem is associated with diseases such as depressive illness, anxiety states, and psychosomatic disorders; it is also associated with prejudice, child abuse, and various forms of delinquency ... The relationship between depression and low self-esteem is of special interest. First, low self-esteem is associated with a pre-disposition depression, even in those who are actually depressed at the time the self-esteem is measured; Brown and his co-workers have suggested that low self-esteem is the final common pathway of factors causing vulnerability to depression. Second, a fall in self-esteem has long been recognised as a major triggering factor of depression. And thirdly, if a depressive state is triggered, a further fall in self-esteem is part of the depressive process.

The article closed with a speculation that the evolutionary origin of low self-esteem and its consequences lay in its being a functional strategy serving to dissuade individuals from starting fights they were unlikely to win. My only quarrel with this is that the functionality is deemed to operate in favour of the weaker adversary, whereas my proposal is that the real beneficiaries are the genes of the abler rival, and those of ancestors common to both individuals.

Some Possible Implications

Since developing this theory in the late 1970s, I believe I have detected its effects across a range of human behaviour, and that of other life forms. Its principal significance to biology seems at this stage to be that it can accommodate those acts of altruism which present some difficulties to the selfish gene thesis which dominates modern biology.

For example, recent field studies

of the honey bee have shown that daughters of the queen bee, who forego their own reproductive opportunities in order to care for their siblings, may not in fact be acting in their own genetic self-interest. The field evidence shows that the queen bee may accept more than twelve drones in her mating flight. As a result, 'the majority of workers, her daughters, would only be loosely related as half sisters and, on ground of kinship, would no longer have the same motive to co-operate'

The comparator gene theory has no difficulties with this. The behaviour of the daughters can be seen as the natural response of individuals who, having judged themselves relative failures at direct genetic transfer, maintain their Hymenopterian equivalent of self-esteem, by performing a 'useful' secondary role.

Similarly, reproductive suppression, which is known to occur amongst low ranking individuals of both sexes in many species, is not easy (although not impossible) to explain in terms of genetic self-interest. However, it fits very comfortably with the idea of benefiting the genes of a common ancestor. Three such benefits can be readily suggested: it gives disproportionate reproductive opportunities to the most successful bearers of these genes; it can enhance the the success of the most successful by making their less able competitors inclined to seek solace in performing useful social functions; and it maintains the availability of the genes of the less able as a form of insurance throughout the reproductive period of their life, against the possibility of a disaster befalling the most able, or the emergence of new environmental conditions for which the less able are better suited ('The Admirable Crichton" effect).

Amongst humans, psycho-Darwinism explains the adage 'nothing succeeds like success', ie, the three stage mechanism rewards behaviour perceived as successful by enhancing physical performance, and by discouraging less successful rivals, in ways which make further success much more probable.

On the darker side, The Lancet article and many other indicators suggest that the same process is a primary cause of mental ill-health.

The comparator gene could also offer a new insight into the motivation underlying anti-semitism, racial prejudice in general, and xenophobia. With each individual vitally concerned about his or her performance in relation to others, behaviour (or even, appearance) which is different poses a deep emotional threat because it may be more successful.

One obvious pre-emptive strategy for dealing with this is to seek to destroy or drive away the potential rival. The mobbing by sparrows of a more exotic bird which has strayed into their territory is almost certainly an example. After all, bright yellow plumage might give the stranger a competitive edge, and from a functional standpoint, the crucial need is to strike immediately the stranger appears, before it gets any opportunity of displaying superior abilities that could progressively undermine the ability to resist.

The comparator gene may also help to explain the stress-related illnesses peculiar to modern industrialised societies. The key characteristic that these have in contrast with traditional societies is the rapid rate of technical and social change. Given the critical importance the comparator gene implies for relative position within a peer group, a rate of change which continually threatens individuals with loss of status in consequence of new developments for which they may be less well equipped, will inevitably generate high levels of stress. This is not to suggest that comparative

performance does not have the same importance in traditional societies, but simply that, in such a society, a position once established is far more likely to be retained.

The comparator gene would also play a major role in maintaining social control. Three reasons can be suggested for this. First, the debilitating effects it has upon 'have nots' because its function is to discourage them from challenging the 'haves'. Second, it focuses attention upon comparative position within a peer group, rather than in the wider society, and since a general social upheaval will impact upon the peer group with unpredictable results, there is a predisposition to leave comparatively well alone. Third, conformity can be an effective strategy for minimising the extent to which the comparator gene is activated. This carries the risk that, by constraining social development, it will render the group, and possibly the society, incapable of meeting new challenges. There is no shortage of historical examples.

Finally, to carry out the circle back to Darwin, the comparator gene would explain something over which he regularly puzzled: why do human beings have emotions? Although Dr Dawkins is strictly correct when speaking about the evolutionary competition between *genes* taking place, on their part, 'without feelings of any kind',[8,p20] in a wider sense, psycho-Darwinism suggests that feelings are very much part of the evolutionary process.

This is not to imply that the emergence of the comparator gene occurred simultaneously with the inception of life and the commencement of natural selection. Nor is it necessarily common to all life forms. But it is very old, even in terms of biological timescales, and for this reason, emotions, if only in a rudimentary form, have been a key component of natural selection for a very long time.

Why the 3 stage mechanism may not have previously been noted

Psycho-Darwinism can be challenged on the grounds that, if the process is so effective and so general, why has it not been identified before? This question can be answered at five levels:

First, natural selection itself, whilst having by now gained almost universal acceptance amongst the scientific community, was only proposed a little over a century ago after many millennia of human enquiry, and over two centuries after the inception of modern scientific thought.

Second, natural selection would regulate the salience of this characteristic. Members of any group in which it became all-consuming would devote so much attention to watching others, that this activity would impede the effectiveness with which tasks essential to physical survival, were discharged. In other cases, the criterion of relative success might come to be set at so high a level that genetic diversity would be dangerously reduced. In either eventuality, natural selection would favour individuals within whom the potency of the comparator gene was not excessive.

Third, whereas the behaviour resulting from the selfish gene is said to be unequivocally directed towards the success of the individual in achieving genetic transference, that resulting from the comparator gene is more varied and therefore less obvious. The three stage mechanism motivates the individual to take whatever steps it can to remain in a positive state of mind by performing well in relation to its peer group. As has already been suggested, success can be achieved by a number of routes ranging from aggressive competition through subservient social behaviour, to the adoption of a new lifestyle.

Failure can induce a depressive malaise, physical illness, and death. It is not immediately obvious that this diversity of effects can be related back to the same mechanism.

Fourth, much as 'history is written by the victor', scientific advances are usually made by the successful. This is not to suggest that scientists and other academics do not suffer acutely from the negative effects of the comparator gene; empirical observation suggests quite the reverse. However, there is an understandable human tendency to view the positive effects as a natural attribute of one's personality, whilst the negative effects are often seen as an illness, perhaps to be explained in terms of childhood trauma, and, as such, not part of the individual's biological inheritance.

Finally, there is almost certainly a strong human predisposition against accepting such a theory. Thus, Alexander comments on evolutionary theory in general:

> With a few exceptions... other major scientific theories... do not threaten to make our behavior predictable, to expose what we are actually doing in our social interactions, to infringe our concept of free will, or to influence the ways in which we think about right and wrong. Evolution does all of these things because it proposes to explain the explainers themselves... In all likelihood, no theory about anything extrinsic in the universe will ever hold as much intrigue, or encounter as much resistance, as a theory about ourselves. It may be the ultimate irony of human existence that the more any such theory explains, the more difficult it will be to gain its widespread acceptance.[14]

Given that I believe that psycho-Darwinism provides a new explanatory model which offers almost unlimited potential for explaining emotional and behavioural phenomena in terms of natural selection, it may well be that this final hurdle will prove exceptionally challenging.

Waller-Gardner Exchange by RG

Mike's three steps to how the speed of evolution may have been amplified include an self-observer function in which (i) one compares one's personal status with that of conspecifics, (ii) positive mood becomes correlated with good conspecific comparisons (one feels good when doing well), and (iii) lessened health (and reproduction) become correlated with poorer such comparisons (your health is bad when you measure up poorly).

This latter result seems to be a self-excising mechanism, fitting deCantanzaro's findings about lethal or completed suicides: such tend to be persons who have little to contribute to future generations either by way of offspring or contributions to relatives (they have poor evolutionary fitness)

A number of general comments: (1) Colorful though all his essays are, the longer version of Mike's thoughts was easier for me to understand.

(2) Mike's background of comparing humans in organizational theory and practice has meant that he may have "reinvented the wheel" of how evolution works in a manner that stemmed from a point of view quite different from that of conventional biology. That may be good: such reinventions can mean better wheels and in this case, some potentially novel ideas.

(3) Mike's answers (which I don't always find convincing--does he *really* disavow group selectionist theory?--nevertheless point to implicit interesting questions:

(a) Why *are* stress responses associated with poorer organismal hardiness, as is well documented, but poorly explained from an "ultimate" or evolutionary point of view (to use an adaptationist assumption)? Is it truly self-excising or is a default situation that the positive self-evaluation overcomes? That is, high degrees of physical competence that go along with confidence and Mike's

positive self-comparisons may be evolved new states, not the reduced hardiness of the stressed out.

(b) To what degree are positive self-assessments associated with positive mood *and* better reproduction? This could use some empirical data.

There are data that leaders reproduce more but do they also definitely have positive moods? Seems likely, but we could use some results. Maybe, for example, the enhanced sex is compensation for negative self-comparisons for which the unsure leader must compensate. Also many males engage in sex without reproduction (eg, employment of prostitutes). Is this a proximate mechanism that doesn't dovetail with the ultimate or evolutionary reasons for the sex drive?

To summarize my point 3, however, the generation of a good new question is in any event more important than answers in science. A new answer is indeed best when it implies a new question that can be investigated. So, good for Mike!

(4) The anthropomorphisms that Mike uses of the "stockbreeder" self-assessment characteristic and the "comparator gene" are forgivable as interesting ways of brainstorming about evolution although of course we must keep in mind that evolution didn't happen that way. But even Dawkins refers to the "Blind Watchmaker," a patent anthropomorphism, and Jacob's famous image of "evolution as a tinkerer" commits the same sin, though Jacob emphasizes his awareness of that. In any event, Mike here focuses especially on the comparator which as a gene or mechanism is described really as a person.

Now let me discuss my more serious problems with Mike's propositions. There is a condition that contradicts Mike's theory. (1) Mania is a condition in which there is good self-esteem (elation, euphoria) and the person with this psychiatric illness constantly compares him or herself with other people and comes up positively. This is an example of Mike's notion of comparator linked with positive mood. The trouble is that the person with this psychiatric illness clearly malfunctions, turns off potential mates, and moreover, often presents as a mixed state in which the person is simultaneously irritable and depressed along with feeling high and driven. How does Mike explain the contradiction between his theory and this mood disorder?

(2) In issues of ASCAP (especially in that of July, 1990, and in response later to responders to the stimulus essay he provided there), J Price has nicely outlined that depressives are likely communicating many things that have useful survival value. How does Mike figure such positive contributions made by depression and losing (both involving negative comparisons of the self to others) in his formulation? How do Price's pathogenetic ideas fit with Waller's?

(3) How does Mike rebut Dawkins' comment that of course Mike is espousing "group selectionist" ideas?[5a]

A partial answer may be as illustrated for sex without reproduction above: a proximate mechanism may seem to outweigh an ultimate cause in particular individuals. It is an issue of deploying a population biological concept to single individuals.

For another example consider the "docility" explanation for altruism that H Simon has proposed[16]. It is so advantageous to possess our human propensity to learn, Simon suggests, that absorption of the proposition that it is good to lay one's life or even just reduce RHP for others is something that we take for granted and appreciate the praise of our fellow humans when we do it. Does Mike agree that his proposals may resemble proximal mechanisms that seem contradictory to ultimate causes?

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2. c/o R Gardner, 1.200 Graves Building (029), University of Texas Medical Branch, Galveston, TX 77550 FAX: 409-772-4288. For ASCAP Newsletter Volume 4 (Jan through Dec, 1991) please send $18 (or equivalent) for the 12 issues. For subscription to the ASCAP Newsletter, make checks or money orders out to "Department of Psychiatry and Behavioral Sciences, UTMB."

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At this time this "informal" organization has no official budget.

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