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"The genome of brain cells, like those of other cells of the body, is continually active from embryonic life until death and is continually responsive to intra- and extracellular signals." McEwen[1]

(c/o Russell Gardner, 1.200 Graves Building (D29), University of Texas Medical Branch, Galveston, TX 77550)[2]

For the philosophy guiding this newsletter, predicated upon combinations of top-down and bottom-up analyses, see footnote on p12[3]

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.

Features: L Sloman illustrates the clinical usefulness of the evolutionary model with a case vignette .. p2
(Note on p 4 that he challenges Aaron T Beck on a variation for the proper phrasing of a therapeutic intervention - what do you think, Drs Beck, Gilbert and other cognitive therapists in the readership?)

Letter; *8 June 1991*

Thank you for your letter of 21 May which crossed with mine enclosing the Nature letter. I am most pleased to learn that you are prepared to publish both essays, and I am gratified by your reference to my style ...

Please feel free to wield your editing pencil as you will...I may have invented the word ["Psycho-Darwinism"] (did I?) but from the pages of ASCAP, it is clear that there was a whole lot of it going on already.

Having started on the back copies, I am deeply impressed by the calibre of the readership and the quality of the debate. John Price's "Metaphors of Submission" particularly challenges me because it suggests that benefits can accrue to the depressed person by virtue of of his/her depression. This varies from my basic hypothesis that it is at best a painful stimulus to improved performance, and if the stimulus fails, a stepping stone to impotence and early death. I note several correspondents also lay stress on depression's lethality.

My mind has therefore started to work along the following lines:

(a) In solving "Dr Price's enigma" [see essay below] *I have suggested that it would increase the evolveability quotient (EQ) of a particular set of genes if it imparted a potential for depression, as part of my three stage mechanism, into the psychological make-up of its heirs.*

(b) I also suspect that there is some substance in the claimed correlation between average depressive tendencies and creativity. And that in the natural world, creativity may be considered coterminous with non-mutant forms of adaptation. It is therefore possible that it would "pay" a set of genes in terms of EQ to impart a propensity to nurture and support depressives, within some members of a breeding group (compare to an industrial organization allocating some proportion of its resources to R&D activities).

(c) Given that such individuals

came into existence, they would naturally be vulnerable to the type of manipulation by depressives that John Price describes. Indeed, there would even be scope for what we might call mock-depressives to exploit this nurturing propensity, much as a cuckoo takes advantage of another type of bird's parental instincts.

This is no more than the outline of an idea but I would be interested in knowing whether you think it worth working up.

Obviously the idea that some might be born to suffer in order to give their breeding group an adaptive edge, and that others are preconditioned to make sacrifices in their support, only makes sense if ancestor gene theory is accepted. There is, however, a rather nice resonance with that epitome of creativity, artists "suffering for their art."

MJC Waller, Harpenden, UK

The ideas seem generative. Are you aware that creativity may relate to mania which seems in turn to co-exist in persons with depression?

Psychotherapy in depression: evolutionary model & case vignette

by L Sloman

Russell, in conversation you have mentioned that a productive model might be one that is both clinically relevant and counter-intuitive. In order to continue this dialogue I provide a short clinical vignette and then discuss how the intervention was shaped by an evolutionary paradigm.

A family sought help because of its ten year old son's severe behaviour problems and extreme sibling rivalry between him and his eight year old brother. The mother described herself as chronically depressed and as subservient to her husband who was mostly disinvolved with the children, but at times exploded at them.

A few sessions into therapy the mother came alone, as father "could not make the appointment." The mother recognised her own subservience, but viewed this as largely independent of her depression.

The therapist pointed out to her that there are various degrees of submissiveness. A mild degree could be culturally determined. But extreme submissiveness, or "hypersubmissiveness", characterised by feelings of inadequacy, inferiority, helplessness and hopelessness, could be experienced as "feeling depressed."

He explained that these feelings have valuable functions, because as an integral part of yielding or submission they prevent conflict from getting out of hand. He speculated that the mother must have had good reason for deciding to be submissive and wondered whether this was her way of trying to keep her marriage stable. The therapist explored with her how she might respond if she decided to begin to give up being quite so submissive. He wondered how she felt others might respond if she were to become more self-assertive and self-confident. The therapist suggested that she must have had good reason for not being self-assertive.

She responded that after getting mad at people she felt "she had acted like a bitch." When the therapist expressed interest in how she had come to feel that way, she described a childhood with an autocratic father where she learned to be obedient and not talk back.

She later claimed to be self-assertive with her children, because she often screamed at them. The therapist disagreed: from her description, her screaming reflected helplessness rather than strength.

Towards the latter part of the session, the therapist asked the mother if she were to decide to become more self-assertive could she think of any situations where she might respond

differently. The mother listed a number of ideas, including an insistance that her husband attend the next session. A few weeks later, she said her husband had agreed to come with her and that she felt less depressed.

One could speculate that mother's increasing self-confidence and positive mood could de-stabilize the marriage, or could lead to a more productive and meaningful relationship. The mother was certainly now able to handle her son's aggressive behaviour effectively and also to show both children more affection.

The thrust of the intervention was not merely that she assert herself. Rather it aimed to help her become less submissive and to feel better about herself so she could express herself more openly and directly.

The above interventions were based on an ethological model. The interactions between members of a family group are largely shaped by a combination of bonding and agonistic behaviours. When these agonistic mechanisms function smoothly, we assert or express ourselves in an open, direct fashion and also, either avoid getting into conflicts, or readily concede defeat.

When problems arise one often observes the following scenario: fear of losing prevents the person from being self-assertive, because that would increase the danger of defeat. The same fear also makes it harder to accept losing. As a result, the individual is torn between the need to assert himself and the need to yield with the result of doing neither. If the conflict becomes more intense the individual may feel more pressure to do battle, but the countervailing pressure to yield may result in non-yielding hypersubmissiveness, which can culminate in a depressed mood and perhaps in clinical depression.

The basic premises are as follows. First, yielding and dominance are deeply ingrained patterns of response. Second, many patients including those with either Axis I or Axis II disorders, show inefficient functioning of these mechanisms. Both mechanisms often act synchronously with the result that each blocks the effective action of the other.

The person is therefore unable to yield and end the conflict. This may be observed in persons engaged in dysfunctional power struggles. Terrified of losing, ability to confront opponents in an open direct fashion becomes inhibited. Because they fear defeat, they avoid open confrontation. This fear of losing also inhibits them from submitting so they avoid admitting being wrong. This means they have difficulty either asserting themselves or submitting.

Their submissiveness manifests itself in expressions of helplessness, inadequacy or victimization. However, as their submissiveness is a defence against underlying hostility, they exhibit both fighting and submissive tendencies. This person may react with more extreme submissiveness (that we label "hypersubmissiveness") when the conflict escalates, and this may culminate in depression.

On the other hand, the individual who experiences this conflict may demonstrate out of control dominant behaviour that escalates into mania.

The therapeutic aim is to promote smoother and more efficient functioning of these agonistic mechanisms. This entails helping the patient to yield when it is appropriate. For true yielding to occur, a direct confrontation must be a viable option.

Therefore, in order for the hypersubmissive client to feel comfortable about yielding, the person must first end hypersubmissive responses and be able to respond in a self-assertive fashion. Many depressed patients continue to cling grimly to unachievable goals which indicate they have irreconcilable dominant and hypersubmissive responses.

This evolutionary paradigm fits with various therapy models including psychodynamic and cognitive models as well as reality therapy. The original adaptive function of these agonistic mechanisms represents a cornerstone of this approach because the therapist can reframe feelings of inadequacy, inferiority and helplessness as not just pathological but as useful in group cohesion. The refraining is based on the therapist's knowledge of the mechanism's evolutionary function. Persons with more conscious awareness of their own mechanisms find it easier to decide about fighting or yielding. The therapist's task is to help patients who are less aware become more mindful of available options.

The approach approximates the cognitive model more than any other. Because I am interested in his response, I hope that Aaron Beck, the founder of cognitive therapy, will not object if I draw a distinction between what I think he might say and how one might approach the same situation using this paradigm. Beck might say to a patient "when you were not able to respond to that challenge it must have left you feeling helpless and hopeless." Using this model one may say "you preferred to submit rather than cause conflict and disharmony and upset other people".

Thus, one puts positively the submissive behaviour to position the patient in a therapeutic "double-bind." If the patient accepts the intervention, this leaves him/her feeling less inadequate. If the patient does not accept intervention, he or she must become self assertive to disagree with the therapist. There is a similarity between how the therapist utilizes the evolutionary adaptive function of the yielding mechanism and the way that family therapists utilize the systemic function of a negative behaviour to connote positively that behaviour.

This model is oversimplified as it requires more than one vignette and more detailed discussion to do justice to the complexity of the topic (which we have begun to address) .

Michael McGuire described how, when a man refused to press an elevator button for him, Michael asked, "How come?" The answer, "I decided to refuse because I am now in an assertiveness training group," demonstrates an unsuccessful attempt to act self-assertively on the part of a submissive person as being self-assertive involves being open, direct and self-confident. The man refusing Michael may have tried to compensate for feelings of inadequacy by acting in superficially self-assertive. The submissive person who acts assertively is more likely to elicit a negative reaction than someone truly self-assertive. It follows that when trying to help clients be more self-assertive, aim at helping them give up their submissive patterns.

Psycho-Darwinism, or Why Nothing Succeeds Like Success by MJC Waller

For the past decade I have worked on a development of natural selection theory with particular relevance to the study of human psychology. It also suggests that the current emphasis upon each individual's genetic self-interest as the only reliable explanation of genetically programmed behaviour, is misplaced.

I illustrate the contrast between what I am proposing and the orthodox neo-Darwinian position as follows:

Imagine that Oxvard Bio-Dynamics and Harpenden Enterprises have both been invited to submit designs for "Primogenitor," an artificial life-form intended to bio-colonise a new planet as diversely and rapidly as possible without further human intervention. Oxvard is content simply to produce its basic egocentric design in sufficient numbers to ensure main-

tenance and growth, leaving random variation and marginal advantage to have the same long term effects they believe them to have had on earth. Their one special feature is the Mark 1 Hamilton inclusive fitness device which allows individuals to defer genetically to close relatives if this gives genes common to both enhanced prospects for survival.

Harpenden Enterprises knows it must come up with something special if it is to beat this seemingly invincible arrangement. It therefore opts for a design which incorporates an improved version of the Hamilton device (Mark 2) having the additional effects:

1) It compels each individual within the genus primogenitor to assess its performance continually in all matters affecting genetic replication, in relation to a self-selected peer group.

2) Where an individual's own assessments and the reactions of its peers reflect a comparatively high level of performance, it will experience a sense of well-being. This in turn will trigger physical responses that will act as a multiplier upon its rate of genetic replication by, for example, stimulating its libido and making it more active generally, increasing its attractiveness to mates, discouraging predators, warding off disease, and causing it to act in ways inducing deference from rivals.

3) Where its own assessments and the reactions of its peers reflect a comparatively poor performance, it will become depressed. The only ways of relieving this depression will be: (i) to raise comparative performance; (ii) to adopt a well-received social role supportive of high achiever(s); (iii) to benefit from an environmental change to which it proves better suited than its peers (the "Admirable Crichton" effect); (iv) to break away from the reference group by successfully adopting a novel lifestyle.

4) Where none of the above options are practical, its depressed emotional state will trigger physical changes that will eliminate it from the genetic stock by, for example, suppressing its libido, deterring mates, attracting predators, reducing resistance to disease, and making it the butt of its peers' aggression.

I make two claims with respect to this scenario: (a) provided there was some depression of environmental variation ana/or change on the planet, the Mark 2 Hamilton device would so enhance the comparative rate of adaption achieved by the Harpenden design that its "evoholics" would comprehensively out-adapt their Oxvard rivals, leading to the latter's rapid extinction.

(b) They would similarly eliminate any of their own kind who, through genetic variability, "attempted" to backslide to Oxvard's more laissez-faire regime.

I think my objective in using this illustration is clear. I believe that the extended version of inclusive fitness I have described is in fact already in place and at work within very many species, humans included, and has been for a very long time. In terms of evidence, I suggest that if each link is taken in isolation, the existence of the mechanisms I have proposed is entirely uncontroversial.

For example, in a review of self-esteem research, published in "The Lancet" in 1988, Dr John S Price pointed out that:

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...(and there is an)... enormous range of variation between individuals...Some people think the whole world is their oyster; others feel they have no right to exist...self-esteem is interesting to medicine because low self-esteem is associated with diseases such as depressive illness, anxiety states, and psychosomatic disorders...

Indeed research evidence showing that mental state has powerful ef-

fects on physical well-being, recovery rates, accident-proneness, and even the probability of apparently healthy hearts suddenly failing catastrophically, has now almost become commonplace.

However, I believe I can make some claims of originality on two grounds: first, in offering a comprehensive explanation of the way in which the comparative performance -—> mental state -—> physical well-being sequence, acts as a multiplier on the effects of natural selection.

Second, in pointing out that this concept offers an exceptionally elegant synthesis of the hitherto irreconcilable group selection and selfish gene theories. After all, the only consistent beneficiaries of this mechanism are the genes of the individual(s) who first passed it on, ie, Mr (or Mrs) Primogenitor, whose genes come to monopolise the planet. However, its out-workings would in some circumstances appear to show individual-sacrificial, group selection in operation, whilst in others, seeming to be exclusively directed by the interests of each individual. The "choice" made in every case is that which is most likely to be to the greatest genetic advantage of the common ancestor.

I need hardly stress that I am not suggesting that a cunning little primogenitor sat down in the primeval soup and worked all this out. That would be no more sensible than proposing that an individual with a small patch of light sensitive skin, preconceived the eye. However the "comparator gene" mechanism is by no means complex and could quite feasibly develop by incremental stages. My own belief in its existence is posited on two eminently challengeable assumptions:

-as there is nothing to prevent its naturally coming into existence at some stage during the evolutionary process; it almost certainly has, and

-having come into existence, its benefits in terms of the natural selection process are such as to ensure that it would rapidly become widespread, if not universal.

Beyond these assumptions, I believe that what I now call psycho-Darwinian model, and that as a concept, it has enormous potential in explaining both emotional and behavioural phenomena in terms of natural selection.

More specifically, I am confident that it fully answers the following question first raised by John Price in the 1960s:

> States of excessive depression, anxiety, and irritability are very common. Possibly one in seven of the population consult their general practitioner 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. When then are we as a species lumbered with these most disagreeable tendencies - why are we all not paragons of calm, energetic happiness?

A longer paper entitled "Solving Dr Price's Enigma: an introduction to psycho-Darwinism" will be published in a later ASCAP.

McGuire - Price Exchange by J S Price

I agree with Michael McGuire that "depression is a physiological/psychological response to suboptimal goal achievement." I think it is important to take a social view of goal aspirations (see ASCAP 1989;2(June): 4-7). My goals may conflict with the goals of others, and, if so, to the extent that I achieve my goals they can't achieve theirs (and vice versa). If I fail to achieve my goals, two things may happen. First, I may give up the unachievable goal, and possibly help my competitor to achieve his/her goal; this moves me

from the social role of prime mover to one of helper; no mood change is needed for this to happen, only a disposition of sweet reasonableness on my part. Second, I can remain stubborn and refuse to abandon my goal, in which case I continue to experience suboptimal goal achievement (frustration non-reward or punishment) and this induces the physiological/psychological response of depression, whether I like it or not. The depression incapacitates me so that I can no longer interfere with my competitor's goal pursuit by my aggressive or other assertive behavior; I may or may not give up my own goal, but at least I am not jeopardising those of the rest of my social group; in fact, the "giving-up" frame of mind which is part of the depression may assist me to give up my goal and switch from the role of depressed and incapacitated competitor to one of cheerful helper.

This theory requires that depressed patients are not hostile and aggressive, or at least, if they are, that their hostility is ineffective. McGuire points out that some depressed patients are withdrawn and others are aggressive - if this is so, and the sum total of aggressiveness is no different from that of non-depressed persons, the yielding theory is refuted. There are certain kinds of aggression which do not contribute to goal achievement and therefore would not refute the theory:

1. Non-expressed aggression. A depressed person may have a mental state of hostile resentment and may communicate this to a psychiatrist or research worker, but if it does not lead to any assertive action against competitors it is of no social importance. The same applies to aggression expressed against the self.

2. Down-hierarchy aggression. One is not in competition with subordinates and therefore down-hierarchy aggression does not contribute to goal achievement. In fact, I have argued elsewhere that one would expect down-hierarchy aggression to be increased in depression (to maintain the RHP-gap). If the patient sees the therapist as being subordinate, there may be no inhibition of the expression of aggression towards him, and this may account for Freud's experience of his rich depressed patients as aggressive, and for Frankel's "angrily demanding depressed patients" (May 1991 ASCAP).

3. Child-like aggression. Children display a lot of aggressive behaviour to their parents, like temper tantrums and sulking. That this is some form of manipulation is probably not in doubt, but it is an attempt to elicit some form of parental behaviour from them, not an attempt to induce agonistic submission or escape. In the main social arena, temper tantrums and sulking do not help to get one's way. In the arena of the school playground, temper tantrums are a feature of the bullied child, not of the bullyer[5]. In marriage, coerced submission is often accompanied by redirected aggression such as the breaking of furniture, and one has to take a very careful history to realise its ineffectiveness. Informants find it difficult to give accurate accounts of aggressive episodes, and have to be questioned very carefully before going beyond such generalities as "and then, wham, everything hit the roof" which do not discriminate between agonistic aggression and child-like aggression.

My own opinion is that effective "agonistic" aggression is greatly reduced in depressed patients, but at the moment one cannot support this view from published data . Published studies have distinguished between expressed and unexpressed aggression, and between other-directed and self-directed aggression; but they have not distinguished between adult and childish aggression, not between ag-

gression expressed to equals or superiors on the one hand, and to subordinates on the other. As a result the information already gained at such expense of time and effort in this field is virtually worthless. If the result of all this theorising is simply to persuade researchers to record the relative rank of the object of the patient's aggression, I feel it will have been worthwhile.

Price-Sloman Exchange by L Sloman

I am pleased to comment here on John's comments (June 1991 ASCAP) and am even more pleased that we can all discuss our possible differences directly in early July.

I will start with a basic formulation: the "yielding subroutine" mechanism functions to cause what John calls "voluntary submission" as a behavior in the same individual. When this behavior is elicited, as when the sequence operates optimally, yielding subroutines terminate, and continued submissive behavior at that point ceases to have useful function. However, when the individual encounters the same opponent later, that individual may be more productive than would have been the case if the yielding subroutine had not activated the submissive behavior.

However, if adversity continues in the form of heightened or prolonged conflict, the yielding subroutine may intensify. This increased intensity could cause a louder repetition of the internal message, "You must submit." Beyond a certain intensity the yielding subroutine takes the form of "depressive yielding." If the depressive yielding elicits voluntary submission early on, the individual's depression may be short lived. One could then look upon the yielding subroutine as part of a negative feedback mechanism which has voluntary yielding as the other component.

As clinicians we desire understanding of not only the factors that contribute to the development of the depressive yielding response but those that prevent its termination. Going to the latter, the following factors probably interconnect: 1) what Kohut calls a "poor sense of self," 2) a prolongation of the conflict by the adversary, 3) a high level of anger, and 4) social isolation. Each of these factors may make voluntary submission more difficult.

I may use the term "voluntary submission" differently than John; to me it not only involves a decision to "give up," but also requires that the individual terminate the yielding subroutine. If the individual decides to give up the struggle but still continues to experience the yielding subroutine, that person undergoes a conflict that may be partially out of awareness.

Because I use voluntary submission to encompasses the termination of a lower level mechanism - the yielding subroutine - I agree with John that another term may be more appropriate.

There is another problem: in addition, the yielding response is a biological mechanism that is triggered by an awareness or realization that one is losing or is about to lose an encounter. Such cognitive processing calls for higher level brain functions.

To me both voluntary submission and the yielding subroutine incorporate higher and lower level brain mechanisms. Whereas John highlights differences between voluntary submission and depressive yielding, I am impressed by interconnections. Even when we think that a submission is purely voluntary, consider the likelihood that a less conscious yielding subroutine may play a covert role.

For example, I consider challenging someone, but then change my mind because the other person seems too formidable. The idea of challenging this

person has caused me to evaluate my chances of success which in turn has triggered the yielding subroutine which in turn influenced my decision to not challenge.

Thus, the biological need to challenge has had added on to it other primitive biological mechanisms that evolved to tame the belligerence. My understanding of these mechanisms leads me to ascribe a more limited role than John to the role of reason in influencing our agonistic behaviours. Whereas John says one always knows why one is yielding, I propose that one is not aware, or at most dimly aware, that one's so-called "objective reasons" are a display of a yielding subroutine.

John claims that only voluntary submission and not depressive yielding is affected by cultural values. However, I believe that cultural values also play a role in triggering biological mechanisms. For example, the cultural value "death before dishonour" may be instrumental in getting one person to challenge another, who will clearly clobber him, and will also prevent him from submitting voluntarily while being clobbered.

John cites Schelde (Feb 1991 ASCAP) who found that depressed patients were high on passive yielding but low on active submission. John also states that depression does not seem to facilitate "directed submission" in the sense of flattery or flowery speeches of submission. As John himself has pointed out, when the loser of a fight is depressed and apathetic, this behaviour reassures the victor that he need not fear a counter attack. This illustrates the aphorism "not communicating is a communication." Whereas John and Schelde consider Schelde's finding to contradict the yielding hypothesis of depression, I feel the findings support John's hypothesis.

It may help to distinguish two phases in being defeated and "giving up." The first is depressive yielding. Note an individual in the terminal phases of losing a match, (eg, tennis) shows signs of discouragement. The second phase of voluntary submission occurs after the match is over when the loser in accepting defeat regains his equanimity while looking forward to enjoying a beer with the recent opponent.

Many patients are stuck in phase one. When voluntary submission can occur, the individual becomes less depressed.

Certainly we often see people with dysfunctional agonistic responses. They may be over-submissive or inappropriately assertive and are likely to have trouble dealing with adversarial situations. The more acute the conflict and the more angry they feel, the more likely they will exhibit a depressive yielding response or perhaps exhibit out-of-control dominant (hypomanic) behavior.

Finally, I believe that John's effort to differentiate between different models may serve a useful function. I doubt we are in fundamental disagreement. By identifying genuine points of disagreement about such issues as terms used, we are more able to look for evidence or construct experiments that provide support for one point of view and in this way become more scientific. I do, however, think that John and I need to define more clearly what we mean by the various terms we have been using.

Sloman-Price Exchange by JS Price

I think we are coming closer together, but I still have difficulty with the statement that "voluntary submission ... requires that the individual terminate the yielding subroutine." The way I see it, the yielding subroutine is an involuntary response and cannot be terminated as a part of a voluntary response. Volun-

tary submission removes the situation which caused the yielding subroutine in the first place (attack from the rival), and which may be maintaining it, so that after voluntary submission, it is more likely that the yielding subroutine will remit. But on the other hand, it may not - once started it may have a momentum of its own. I also have a problem with "continued submissive behavior" (p7 col 2 line 25). I think it should be "continued depressive yielding."

On the other hand we seem to agree about the relationship between the yielding subroutine and depressive yielding, that the latter is a more severe form of the former, or maybe the same as the former but looked at from a clinical point of view.

Goethe-Price Exchange by JS Price

The behavior of the hog nose snake sounds more like tonic immobility than yielding. In response to physical restraint many animals will, upon subsequent release, remain in a catatonic-like state for periods of time ranging from a few seconds to several hours" . This reaction, sometimes called the immobility reflex or animal hypnosis, is thought to be an adaptive reaction concerned with avoidance of predators (rather than submission to conspecifics) . But it is interesting that the snake resumes its former belly-up position when turned over, so it is not complete immobility. Does the snake behave in this way in response to predators or conspecifics, or to both? Presumably the snake is signaling "I am dead, so I am not worth bothering about". It is conceivable that this message might be adaptive in both situations, saying to the predator, "I am dead and probably putrefying and therefore not worth eating" and to the conspecific "I am dead and therefore no threat to you and not worth dominating any further." In the case of the predator the message would be pure deception; in the case of the conspecific it would be a symbolic message using the metaphor of death for the incapacity of defeat. In other species the yielding metaphor would not be adaptive as a predator avoidance device; for instance, it would not be adaptive for a baboon to present its backside to a leopard. I think it likely that the core brain mechanisms subserving predator avoidance and yielding are different, especially the mechanisms involved in the decision to yield or avoid; but that does not mean that subsidiary mechanisms may not be common to the two systems, such as running away, and possibly lying on its back in the case of the hog nose snake.

Laverings in the DNA record by RG

In considering the comments of Mike Waller, Leon and the two Johns (Goethe and Price), I thought it might be useful to consider a speculative history of the evolution of DNA molecules. This is similar to my cladogram suggestion in June and assumes that genomic macromolecules are historical documents with some components older than others.

Older and newer components may, of course, be simultaneously expressed. Feeling depressed or triumphant are only possible if the very basic basic plans for breathing and moving are simultaneously active.

First, predation is very ancient, augmenting life in prechordate free-swimming forms and ever since[8]. The DNA sequences that coded first for predation probably became modified and also coded later for victory. Perhaps some of our ancestors were less likely to eat their victims when they recognized them as conspecifics. Thus an old pattern for eating may have gotten modified for use in dominance hierarchies.

In humans alpha psalic exemplifies

the human display of a victory plan. We can infer that our human DNA confers a species-specific flavor, often less overtly hostile than that coded in other species, seen in teaching, planning, and beneficient giving. In a pathological version, the manic continues striving for victory despite the severe punishers of societal disapproval and suppression of the behavior (eg, calling it an illness, hospitalizing the patient). Reinforcers of the normal alpha program include the ability to claim resources, to perpetuate one's gametes, and to feel good. Compare this to M Waller's "sense of well-being," which he holds is an evolutionary amplifying agent.

Let's assume that feeling good, feeling triumphant, may result from stimulation of "feel good" neurons that DNA has in some of its basic plans (eg, the "reward centers" of Olds, opiate and dopamine receptors). But while important and a cause for behavior, this may be only one factor in a fairly basic program.

For instance, one may feel good when winning in a fight but less good when losing and fleeing. Yet despite this major difference from the subjective side of things, there is great physiological similarity between the flight and fight responses. Indeed, they are designated as ore term: "flight-fight response." The mechanisms are neuronally and hormonally the same, arguing for similarities in their derivation. Perhaps progress was made when our ancestors developed a capacity to feel *less* good!

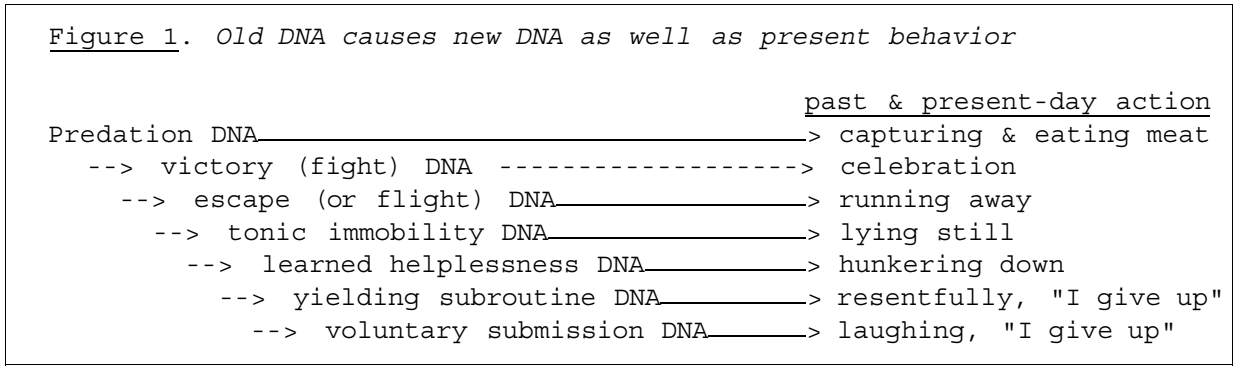
A next step: if avenues to actual physical escape (to be then potentially victorious in another arena) are missing, then the primitive mechanism illustrated by the behaviors seen in "learned helplessness" (LH) may embroider the escape basic plan: hunker down, avoid all interaction and all initiative. This may be similar to what happens in the "tonic immobility" of a would be victim as John Price labeled as the state of John Goethe's hog nose snake. The sequence that John G described last issue had the snake try to frighten off a would-be predator first with cobra-like moves; only after this failed, did the snake resort to something like either tonic immobility or LH[9]. One may be a variation of the other and of course could have evolved quite- differently in the reptiles compared to mammals. Seeing the varied reaction patterns as coded similarly in the DNA may help clarify what may seem, when viewed from the top-down side only, to be quite different behaviors or experiences.

John and Leon have pointed out that voluntary submission (or whatever they eventually decide to call it) makes a virtue of defeat. Perhaps it is an embroidered yielding subroutine (not pleasurable) in which pleasure is regained — remember the tennis player in Leon's example looking forward to that beer and probably laughing and joking.

Testifying to the relative recency of these mechanisms, even mammalians such as mice have only escape as a recourse when defeated. Submissive behaviors aren't evident although of course they might have been lost from an ancestral species. Only in the next millennium perhaps will we know from molecular biologists (in collaboration with us or our intellectual descendants for the behavioral counterparts of their molecular findings) about what chromosomes and what genes carry these blueprints and how exactly they are arranged.

Figure 1 on page 12 illustrates the sequence described above.

In summary, subjective experience whether that of ourselves or our patients, is misleading about mechanisms. Across species comparisons need to be added to new findings in molecular biology to assist us in learning about how we work.



1. McEwen BS: Endocrine effects on the brain and their relationship to behavior. In (Ed) S Siegel, B Agranoff, RW Albers, P Molinoff: Basic Neurochemistry Fourth Edition NY: Raven Press, 1989, pp893-913

2. For ASCAP Newsletter Volume 4 (Jan through Dec, 1991) please send $18 (or equivalent) for the 12 issues. Hake checks or money orders out to "Department of Psychiatry and Behavioral Sciences, UTMB."

3. ASCAP philosophy and goal. High scientific importance rests on comparing animal behaviors across-species to understand better human behavior, knowing as we do so that evolutionary factors must be considered for understanding properly such behaviors. To accomplish these comparisons, very different new ways of viewing psychological and behavioral phenomena are required. This in turn explains why we need new words to define and illustrate new dimensions of comparisons across species. We expect that work in natural history biology combined with cellular-molecular biologic research will emerge as a comprehensive biologic basic science of psychiatry. Both top-down and bottom-up analyses are needed. Indeed, this must happen if we are to explain psychiatric illnesses as deviations from normal processes, something not possible now. Compare to pathogenesis in diseases of internal medicine.

4. a. Sloman L, Price JS, Gardner R: The biology of family systems and mood disorders. Family Process 1989;28:387-398.

b. Sloman L, Price JS: Losing Behaviour (Yielding Subroutine) and Human Depression. Proximate and Selective Mechanisms. Ethology and Sociobiology 1987;8:67S-77S.

5. Tattum DP: Violence and aggression in schools. In (Eds) DP Tattum, DA Lane: Bullying in Schools. Stoke-on-Trent: Trentham Books, 1989, pp7-19.

6. Riley WT, Treiber FA, Woods MG: Anger And Hostility In Depression. J Nerv & Ment Dis 1989; 177:668-674.

7. Hennig CW et al:Duration of tonic immobility in chickens as a function of alpha-adrenergic stimulation and blockade. Pharmacology, Biochemistry and Behavior 1984;20:731-738.

8. Wills C: The Wisdom of the Genes NY: Basic Books, 1989

9. By the way John (Goethe), do you recall where you found this described? It is such a useful story I may want to cite it in another context.