

ASCAP

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"The word which the Greeks used for truth is aletheia, which means discovery, to take away the veil that covers and hides a thing."

Jose Ortega y Gasset¹

Newsletter Aims

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

ASCAP Society Executive Council

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ASCAP Society 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 cellular processes to individuals in groups. The ASCAP Newsletter is a function of the ASCAP society

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For those eligible,
are you thinking of your
offering for the
Aaron T. Beck ASCAP
Essay Contest?

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

ADDRESSED TO & FROM ...

ON FRONTIERS OF CONSILIENCE: PHYSIOLOGY, PATHOPHYSIOLOGY, AND JARGON

This year-end issue combines the best of old and new as a holiday gift to you-all! From the "old", Mike Waller's contributions which link us to the selfish genes of modern evolutionary biology earn the highest praise of being effective stimuli for discussion: Leon Sloman, our president-elect, tilts against Mike's colorful provocations. John Pearce, current president, tells of the importance of an old term, consilience, even as he illustrates the importance of it in another letter by juxtaposing the "drive-theory of psychoanalysis to "domain specific information processing modules" of Tooby and Cosmides.

The latter concepts are often discussed in the email ASCAP (or ASCAP-L) for which "co-listowner" Tim Miller (with John Pearce), presents for you possible subscription information should you have modem access to, as they say, "the net", new jargon sweeping the globe.

Jargon indeed! I must say my heart went out to Ricarda Mussig when I -- an offender -- read her letter on how confusing this new stuff is. Why, asks Ricarda, should she learn new words for an old discipline, human ethology? Why indeed, given that human ethology under the direction of

people like Glenn Weisfeld and Linda Mealey is doing very well indeed with their excellent newsletter.

The present, quite different, newsletter attempts to focus on the multiplex physiology of human relations that underly and potentially help inform the psychopathophysiology of psychiatric and mental illness. That is why we talk of "sociophysiological integration" and its equivalents in the byline and mission statement. Ethology does have some claims on basic-science-hood: recall the 1973 Nobel Prize for *Medicine and Physiology* was given to three pioneering ethologists. Our own founding president, Michael Chance, earned his credentials and fame in ethology. I believe, however, that sociophysiology - admittedly a relatively new term - does better than ethology in capturing the concept of a Harveian basic science, one that includes multi-level mechanisms including individual and group analyses and unflinching views of the genetics, biochemistry and other physiological mechanics of how the body works, whether human or other animals. As John Pearce points out in his consilience piece, *all* of the life sciences are our domain.

Ethology fundamentally focuses on description, which is extremely important for our fields, as Tyge Schelde tells us, and as Gordon Paul's work (summarized in future

issues), powerfully illustrates, but our fundamentally brainstorming newsletter addresses the conceptual problems of our clinical disciplines. Harvey provided a new physiology that fit the data of his experiments, coming as he did from a tradition of measurement-oriented healers in what was at that time the center of medical scientific study in Padua, hand-capped as he and his fellow physicians were by Galen's 14-century old concept of the blood arising from the liver and going from there throughout the body where it was used up unrenewed. In 1628, he came up with new concepts (then) ~ such as "circulation" - to describe his findings.

So we have many new words and concepts, some of which stumble over each other, necessitating in major measure John Pearce's *consilience* as an attitude. How can some of these ideas "jump together"? Kent Bailey attempts to do some of this in his approach to the pathogenesis of anorexia nervosa that comprises the centerpiece of this issue. I hope that it stimulates the discussion it deserves. Kent and his colleague, Linda Roswell, use mathematical terms to relate hypothetical sources of this puzzling disorder. It is a suitable diagnosis with which to begin, as it is so dramatic and somehow counter-intuitive (how can anyone not want to eat?!), but it hopefully isn't the last illness to be approached in this way. In future outlines of patho-

genesis, cellular and molecular levels of analysis may also be addressed.

Discussing molecules, from China, non-ethologist colleagues Fu-Chu He and Zu-Ze Wu provide us with their thinking and research that counter a molecular drift theory which has held that natural selection to be less involved with change in molecular structure than random processes (neutral drift). Their abstracts illustrate that such conclusions were perhaps based on the across-species comparisons of the wrong genes, housekeeping genes, which code very basic plan molecules, not the rapidly evolving regulatory proteins which He and Wu examine instead. They suggest natural selection is involved after all.

Russell Gardner, Jr.
Galveston TX, USA

RE-INVENTING THE WHEEL MAY BRING A BETTER WHEEL

Last night, at dinner, Jonathan Shay remarked that much of The Adapted Mind seemed to be involved with updating metaphors -- namely from drive metaphors to computer/information processing metaphors.¹ An interesting point. He recalled the proliferation of "drives" in old fashioned drive psychology. His criticism seemed to be, what is this but faddish new metaphors? The answer, I'd say, is that science always consists of updates, with theory being constantly better hooked-up to observation and experimentation. For example, drive theorists hoped that brain science would lay bare the biological substrates of drive - the "deep" sources of drives. The pay-off for clinicians

of drive theory was their belief that they were hip to hidden truths about the true "deep" motivations for behavior. Alas, it was little better than believing in spirits, or *homunculae*.

In contrast, the idea of domain specific information processing modules, with underlying species typical dispositions (actually indistinguishable from "drives" but perhaps less brutish), corresponds to common sense observations about peoples' behavior. Not much hidden here - just people figuring out the score and what their chances are in the "fight for love and glory". Note that, when embracing common sensical evolutionary psychology, the clinician loses the claim of having secret knowledge of deep forces hidden from those who have not been initiated into the cult. The clinician loses a traditional basis for claims of superiority - which, as evolutionary psychology teaches us, is no small loss.

John Pearce
Cambridge MA, USA

WE DO NOT NEED A NEW SPECIES OF HUMAN ETHOLOGIST

Many thanks for sending me the quotation of Mayr and The ASCAP Newsletters with its interesting articles. But I must confess I experienced -- at least with some of the articles - the difficulty of abbreviations whose meanings I could not even guess.

Some articles just presuppose that you have not only read certain publications but that you possess all the knowledge an insider may acquire in steady

contact with other group members; for example, an article on "the cartoonisation of Birtchnell".

I think you people are on the way to developing your own race of Human Ethologists which one day will be a new species, with interbreeding difficult. It is a pity, because we are only so few researchers overall in this field, and I am really interested in your ideas, and integration always is a good thing. Splitting up would mean for me that I have less occasion to meet old friends again as John Price and Paul Gilbert.

I continue to be interested in your work, your ideas, and all the people who belong. If you ever have a congress in Old Europe be free to invite me.

Ricarda Mussig
Karlsruhe, GERMANY

FROM EMAIL: ASCAP-L

The cybernetic "board" is working now, at least for some subscribers. For clarity, let's refer to this as the ASCAP list (ASCAP-L), to distinguish it from the organization.

May I suggest that subscribers step up to the podium to state their hopes and expectations for the ASCAP list? I'll go first.

My impression is that ASCAP-L is intended as a forum for mental health professionals and scientists with a Darwinian perspective. The general validity of the Darwinian perspective will not be questioned much, though of course the details are open to debate. One hopes that new subscribers will have a reasonably good understanding of Darwinian principles and evolu-

tionary psychology. A close read of The Moral Animal is probably sufficient.² The forum might be used to exchange ideas about psychotherapy, pharmaco-therapy, diagnosis, assessment, family, marital and organizational interventions and so on. Additionally, we might exchange clinical lore and anecdotes, interesting or difficult cases, and generally praise and congratulate each other for understanding and maintaining the Darwinian perspective in spite of the incomprehensible obstinacy of our colleagues who seem wedded to the standard clinical psychology and psychiatry model (a subset of the standard social science model).

I hope this will be an active, productive and friendly board. Ideally, we will recruit our Darwinian friends and colleagues, and recruit from other sources as well.

This is a closed list, which means people cannot subscribe themselves. A listowner has to do it. John Pearce and I are the listowners. God knows John isn't stuffy, and I try not to be. If someone is genuinely interested and actively involved scientifically or professionally in mental health-related activities, that's good enough for us. Prospective subscribers contact me by Email:70611,410@compuserve.com.

Timothy Miller
Stockton CA, USA

IN PRAISE OF CONSILIENCE

I am fond of the word "consilience". It is an obscure word, appearing only in the Oxford

English Dictionary and unabridged dictionaries. Given as I am to clarity in writing, or at least to claims that I advocate clarity, why embrace so obscure a word? The answer is, in part, that I lie. I do like a bit of mystification, but not neologisms. I like a pompous old word, especially when there is one that does the job perfectly. So it is that I like "consilience". Here is the definition:

1) *OED, CD-ROM version, 2nd edition: consilience. The fact of "jumping together" or agreeing; coincidence, concurrence; said of the accordance of two or more inductions drawn from different groups of phenomena.*

Examples: 1840 Whewell Philos. Induct. Sc. Accordingly the cases in which inductions from classes of facts altogether different have thus jumped together, belong only to the best established theories which the history of science contains. And, as I shall have occasion to refer to this particular feature in their evidence, I will take the liberty of describing it by a particular phrase; and will term it the Consilience of Inductions. 1867 - Hist. Induct. Sc. Such coincidences, or consiliences-are the test of truth. 1861 Mill Utilit. The consilience of the results of both of these processes, each corroborating and verifying the other.

2) *Webster's New Universal Unabridged Dictionary, Second Ed.: consilience n. [L. con, together, and saliere to leap] a coincidence; the act of concurring.*

Here we find a word for what we do. We take established scientific ideas, or promising new ideas, and jump them together to get more new ideas, especially new clinical ideas, "each corroborating and verifying the other".

Of course, anyone with a fondness for intellectual integration must do just this. How, then, are we different? I think that we are different from most of our colleagues in the breadth of the life sciences ideas that we grab onto, and then leap together. We happily grab *any and all* life science ideas.

And, of course, all the life sciences are enlivened, increasingly enlivened, by evolutionary thinking. Hence, the two themes of our movement: consilience, the jumping together of disparate ideas, and evolutionary reasoning.

It is a happy thing that there is a fine, oldish (160 years isn't really all that old), slightly pompous word for what we do. Consilience. If I had a newsletter, that's what I'd name it: Evolutionary Consilience. Readers would have to look it up in the OED, unless we showed some mercy and printed the definition as a footnote. What fun! And how wise. Begin with a little mystification and *then* talk plain sense.

John Pearce
Cambridge MA, USA

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ARTICLE: **Response to Michael Waller**

Mike Waller, in ASCAP of November 1994, saw himself as requiring the wisdom of Solomon in having to adjudicate between the Involuntary Subordinate Strategy (ISS) and Birtchnell models. He later appeared to shift his identification to the biblical Daniel by saying he was putting his head in the lion's mouth. I personally wonder whether having the wisdom of Solomon might perhaps cause one to conclude that efforts at adjudicating between these two models were indeed a fruitless exercise. For example, I see Birtchnell's model as being so different from my own that I don't consider them competitive - it is like comparing apples to oranges.

A more fruitful exercise to my mind is to examine how the ISS model can be integrated with other models, how much these models overlap, and the specific points of disagreement. For example, in practise I find it helpful to use both the psychodynamic model and the ISS model, but there are fundamental differences. For example, the psychoanalyst might view a low self-esteem as arising from frustration. I would be likely to see low self-esteem as an involuntary communicational strategy (the ISS) perhaps related to an unsuccessful challenge or over-ambitious strivings.

One overlap between the ISS model and other models might be the notion that the Jungian Archetype might represent a biological mechanism. An example of an integration between the ISS model and the attachment model might be the notion that individuals with an "insecure attachment" have more difficulty in making the transition from the ISS to the stage of acceptance.

Mike Waller states: *"It is quite possible that causing the least fitted of bearers to behave in a dysfunctional way is actually in the evolutionary interest of the genes responsible"*. I agree with him. However, I feel that one needs to examine carefully whether there is some additionally adaptive function underlying the so-called dysfunction. For example, one adaptive advantage of the ISS that may have been

overlooked is its role in the transmission of knowledge and culture. This is because when children accept the authority of older generations they are much more likely to be receptive to the knowledge they convey as well as their moral values.

To now take a conceptual leap, I have argued before that, when individuals compete, one may over time observe a "maladaptive cycle" developing in those who lose, which has the effect of impairing both their own viability and that of their offspring. As a result one observes as "deviation amplification" whereby small differences between competing individuals are greatly magnified so that the less successful individual's ability to compete successfully is progressively impaired and this extends to sexual selection.¹ It was argued that as a result of deviation amplification, small negative mutations would be much more rapidly eliminated from the gene pool and small positive mutations would spread more rapidly through the gene pool.²³ This would have greatly accelerated the speed of human evolution and might partly account for the rapid increase in human cranial capacity over the last two million years. This line of argumentation has been criticized on the grounds that it represents a "group selectionist" argument. We have in rebuttal claimed that it is not group selection by using the analogy of Sickle Cell Anaemia which can have serious consequences, but can also be beneficial because it confers an immunity against malaria. The "maladaptive cycle" is maladaptive in one way but adaptive in another. However, I would argue that our evolutionary mechanisms are more complicated. For example, the ISS can be highly adaptive when quickly triggering psychological acceptance and submission. When the individual is no longer able to cope with the agonistic loss or loss of a loved one, the ISS may be more prolonged so that the individual experiences more severe depression. The adaptive response has now become maladaptive. Though I have oversimplified the issues, I don't feel that I should take up any more space.

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ARTICLE: Anorexia Nervosa: A disorder profile

Our model of paleopsychopathology proposes that both physical disease and mental conditions reflect predisposing physical pathology, predisposing psychological pathology, environments of evolutionary adaptedness (EEA)/current environment mismatch phenomena, cultural/neocultural deviance phenomena, levels of cultural/neocultural failure, levels of cultural/neocultural success, and conflicts between the separate impulses to achieve biological and cultural success.¹ Each of the terms in this model are defined and summarized in Table 1, as follows:

Our model may be viewed as a re-statement of the diathesis-stress model in evolutionary terms. Predisposing physical and psychological pathology represent diatheses that are aggravated by mismatch, cultural deviance, cultural failure, and conflict between the presses for biological versus cultural success.¹ In this approach, high levels of predisposing pathology may be aggravated by weak aggravators, as when a person at high genetic risk for cardiovascular disease or schizophrenia exhibits overt symptoms under minimal stress, or conversely, by strong aggravators when a structurally normal

Table 1

Additive Components of Physical/Psychological Pathological (Component followed by definition)

Predisposing Physical Pathology: current diseases and dysfunctions and residual effects of prior diseases/dysfunctions

Predisposing Psychological Pathology: current levels of psychopathology and residual effects of prior psychopathology

Human Nature-Culture/Neoculture Mismatch Effects: current levels of physical distress, internal disharmony, and frustration due to disparities between original evolutionary environments (EEAs) and present circumstances (especially cultural ones)

Cultural/Neocultural Deviance Effects: the degree to which the individual is self- or other-classified as deviant relative to group-defined norms. At the extreme, out-group status is associated with high levels of ascribed deviance.

Cultural/Neocultural Failure Effects: failure here refers to the degree to which the individual has not achieved cultural/neocultural success. Failure is the mathematical complement of success in the respective cultural/neocultural realms. Thus, on a scale of 9, if the individual is rated a 6 on cultural success, then the corresponding cultural failure rating must be 3.

Conflict Between Separate Strivings for Biological versus Cultural/Neocultural Success: this refers to the degree to which the separate impulses are similarly emphasized or whether one impulse is emphasized over another. For example, the mother who forsakes a college degree to raise her children illustrates one pattern, whereas the individual who forsakes reproduction of offspring for cultural reward is another.

Notes:

1. We define **culture** as the shared beliefs, customs, values, and symbols of a particular people. Modern human culture is viewed as phylogenetically continuous with the social organization of the common ancestor of the human line, but great leaps occurred with the language capacities of **erectus** and the unmatched representational capacities of **sapiens**. Nevertheless, modern culture is of the same stuff as ancestral cultures, and is erected on the human willingness to conform.¹

2. By contrast, **neoculture** is erected upon relatively recent **technological advances** in human history and essentially transcends culture. It requires extensive formal education for even minimal mastery, and is the province of the highly educated, privileged few. In general, neocultural skills generate more social reward in modern societies than do cultural skills.

3. It follows that greater levels of mismatch, deviance, failure, and conflict will be associated with the phylogenetically newer, more stringent, "unnatural" requirements of neoculture as opposed to culture.

person exhibits pathological reactions under the massive stresses of child abuse, torture, the breakdown of social order as in Rwanda or Bosnia, and so forth. Our approach offers some advantages over the traditional diathesis-stress model in that it is evolution-based and provides a means of partitioning out the various components that aggravate the individual's pre-existing levels of pathology. Anorexia nervosa is a complex, multi-faceted, and puzzling disorder that involves intricate relations between proximate and ultimate levels of causation. Condit reviews the various biological, psychological, sociocultural, and evolutionary models designed to explain anorexia, and she argues that a synthesis between proximate and ultimate levels is necessary to understand the disorder. In this commentary, we will analyze anorexia paleopsychopathologically, with the goal of developing a disorder profile based on the various components outlined in Table 1.

Predisposing physical pathology

Certain predisposing physical conditions appear to predispose one to anorexia including genetic vulnerability, hypothalamic defects, and neurotransmitter dysfunctions. Holland *et al.* argue for a genetic factor, given that certain genetic defects are associated with eating problems (e.g., the Prader-Willi syndrome), the set point for individual weight is genetically mediated, and the families of anorexic patients have a high incidence of eating disorders. More definitively, Holland *et al.* studied forty-five pairs of twins (25 MZ and 20 DZ), and found concordance rates of 56% for the MZs and 5% for the DZs, yielding a very high heritability of 0.98.³ Moreover, their data also suggested that amenorrhea, weight loss, "drive for thinness", and "body dissatisfaction" may be heritable.

Copeland suggests that anorexia is a disorder of weight regulation that appears related to hypothalamic noradrenergic activity, and Garfinkel and Garner say that anorexics typically show low plasma levels of gonadotrophin.^{4,5} Moreover, their 24-hour patterns of gonadotrophin secretion appear "immature" in that they resemble those of preadolescent girls. Condit concludes that anorexia seems to interrupt the reproductive process by returning the

individual to a prepubescent state of sterility. Anorexia may also be related to low levels of hypothalamic serotonin activity, which disrupts the hunger satiety response in the "never satiated" direction leading to compensatory hunger inhibition.⁶ Low serotonin levels may help explain the high levels of depression and high suicide rates in anorexia as well.

Gender and age are biological variables in large measure, and the social epidemiology of anorexia reveals that the disorder is heavily concentrated in female adolescents (most especially those from the higher classes in highly industrialized countries). The gender distribution is heavily skewed toward females (roughly 90-95% female), with the majority being single and young. One goal of our analysis will be to consider some of the reasons why young females are at greatest risk for the disorder.

Predisposing psychological pathology

Anorexic patients tend to come from problematic family situations and they exhibit a number of anomalies of psychological development. Psychoanalysts have emphasized the oral symbolism and sexual conflicts in anorexia, and Bruch saw the disorder as a "repudiation of sexuality" with an overriding fantasy involving oral impregnation.⁷ Ceaser suggests that brain endorphins may play a role by linking the oral experiences of the infant with later brain function and anorexia.⁸ Ego analysts have focused more on issues of identity, independence, control, and self-doubt. These issues are played out in a very enmeshed mother-daughter relationship, where the anorexic has little power or control save over her own bodily processes.⁹ She is forced to conform to parental wishes and standards, and does so outwardly; inwardly, she experiences resentment and self-doubt, coupled with a desire for separateness and independence. These conflicts produce depression, obsession with matters of control, poor decision-making, and a distorted sense of reality, leading eventually to outbreak of symptoms.

Mismatch phenomena

Mismatch theory is premised on the assumption that

the various biological structures, psychological mechanisms, and design characteristics that evolved within the environments of evolutionary adaptation (EEAs) are now poorly coordinated with and often antagonistic to current circumstances. In essence, the individual is seen as caught in the crossfire between his/her inherent needs and wishes, on the one hand, and living circumstances that typically bear little resemblance to ancestral ones on the other. As Barash says, "...we are the **product of biological evolution - a slow and natural process... yet we are enmeshed in our own cultural evolution, which is fast and somehow 'unnatural'**" (p. 1)¹⁰ The notion of EEA/current environment mismatch is scattered throughout the literature on evolutionary psychopathology¹¹ and it also plays a featured role in Darwinian medicine^{12,13} and the "paleolithic prescription" for good health and psychological well-being.¹⁴ Mismatch theory is also implicit in the evolutionary psychology of Tooby and Cosmides which emphasizes the complex ways that past evolutionary designs and mental mechanisms exert influence in current contexts.^{15,16}

A major corollary of mismatch theory is that **the magnitude of the EEA/current environment mismatch is positively correlated with levels of both physical and psychological pathology. That is, the greater the disparity between the natural hunting and gathering ecology of the EEA and current overpopulated, highly technological, and highly enculturated environments, the greater the likelihood of pathological outcomes.** High levels of mismatch may be induced in the biological domain by polluted air and water, noise pollution, poor diet, insufficient exercise, and so forth, or they may be induced psychologically by current mating practices, child rearing practices, social interactions, cultural pressures, and so forth, that are inconsistent with the templates set down in the EEA. Mismatch tends to produce dysregulation in the biological system (e.g., immunosuppression) and "stress" in the psychological system, thereby putting the individual at greater risk for both physical disease and psychopathology.

Anorexia nervosa is especially intriguing from the

mismatch standpoint, given that it is basically a **disorder suffered by females in highly industrialized societies.** The anorexic appears to have a dreadful fear of carrying out normal species mating and reproductive functions in her *current* "environments of adjustment" (EAs). It is doubtful that anything like anorexia existed in the EEA, but it was likely that ancestral females used control of body fat (within reasonable limits) as a means of timing fertility and production of offspring. According to the **reproduction suppression hypothesis, ancestral females were** endowed with an adaptive weight control mechanism that enabled them to control the timing of sexual maturation and hence first reproduction.^{17,18} This mechanism is probably neurologically mediated through the pituitary-hypothalamic axis¹⁹ with supports from the noradrenergic and serotonergic neurotransmitter systems.² Anorexia is clearly a disorder of hypothalamic malfunctioning, but it is often unclear what is a neurochemical cause of anorexia and what is an effect.¹⁹

The cue that appears to activate the reproductive suppression mechanism is the young female's assessment of probable success of reproduction in the current situation versus future reproductive success.¹⁷ When first reproduction appears more fortuitous at a future time, diet could be adjusted so that body fat dropped below the critical threshold for efficient ovulation and fertility, and probability of current reproduction would be reduced accordingly.²⁰ **As Condit says, "...when physical, social, or psychosocial conditions are unfavorable for successful reproduction, strong selection pressure would favor the human ability to delay the heavy investment required to produce and rear high-cost offspring" (p. 405)²**

The reproductive suppression mechanism represented a relatively low-cost means of deferring reproduction until better times, and probably extracted few serious costs in terms of health and viability for the ancestral female.² It is quite another matter, however, for the heavily "mismatched" high status female in modern industrial societies. Whereas the ancestral female was generally protected by family from unwanted sexual activity and

few suitors were available in the small, in-bred groups anyway, the young female in modern society is bombarded with often provocative sexual material through the media, within a context of permissive sexual standards. Moreover, it is often socially inappropriate to "protect" today's females. In many ways, our own society represents the worst possible scenario of permissiveness and opportunity wherein the young female might defer sexual activity or postpone reproduction. The parents of the anorexic often do attempt to infantilize and protect their daughters in the sexual area, but they cannot thereby eradicate the anorexic's deep-seated fears of sexuality and the demands that come with maturity.

A growing number of young women in industrialized societies seem to be calling upon the ancient wisdom of the reproductive suppression mechanism to deal with the dilemma. There seems to be a realization that reproductive maturity is "coming too early", and the reproductive suppression mechanism is activated - perhaps more or less normally at first - with eventual devastating consequences. Unfortunately, the anorexic female is unable to emulate the ultimately adaptive suppression mechanism/environment inter coordinations of the EEA, and the mechanism is expressed in dysregulated, hypertrophic fashion.

In theory, reproductive suppression was only activated in the EEA when deferment of reproduction served adaptive purposes, and the more common scenario was for plump and fertile ancestral women to produce offspring early in their reproductive careers when circumstances permitted. Female plumpness was probably the norm in ancestral environments, and continues to be the norm in most of the modern world, many technologically advanced societies included. Even in industrialized North America, men tend to prefer women who are plumper than women want to be.²² Despite evolutionary norms and male preferences, women in highly industrialized societies tend to value thinness, setting up a conflict between "social pressures to become and remain thin" and "thrifty genes that store fat".²³ In the pursuit of thinness for its own

sake, modern women may be inadvertently hyperactivating the reproductive suppression mechanism, with anorexia resulting in extreme cases. This is a classic example of EEA/current context mismatch, where the natural tendency towards plumpness and high fertility come at loggerheads with a cultural value of extreme thinness.

Cultural/neocultural deviance

Sociocultural models of psychopathology focus on relations between the individual and society, with special emphasis on social deviance, social labeling processes, and abnormality as a social institution. Some argue that ascriptions of abnormality always involve a social judgment by persons in power (e.g., mental health professionals), and psychiatric diagnosis may be seen as a two-stage process where, first, a *deviance* is noted (by anyone ... e.g., parents, teachers, law enforcement officers), and, second, a *judgment* of normality/abnormality regarding the deviance is made by a designated professional.¹

Typically, being deviant or "different" is associated with psychopathology, but sometimes being too socially-controlled and conforming is pathological. Anorexia is a classic instance of pathology that is aggravated by extreme conformity, obsessive self-discipline, and the drive for cultural success within the context of middle to upper class social striving. For example, Crisp *et al.* reported that 80% of their anorexic sample were described as compliant children. In large measure, conformity and social ambition are self-imposed, but anorexics tend to come from families with high expectations for cultural success.² Often the anorexic's mother attempts to live out her frustrated ambitions through her compliant, "perfect" daughter, but she often double binds the daughter by inducing guilt over achieving success.²⁵ Despite these obstacles, the daughter may achieve cultural success, but at great cost. One such cost is in adopting the cultural "thin is in" attitude in order to gain approbation from female peers.²⁶

The anorexic often conforms outwardly both culturally (e.g., social conformity) and neoculturally (e.g., educational striving), but inwardly she longs for

independence, personal control, a sense of identity, and freedom from oppressive family expectations. Yet, at the same time sexual maturity and its attendant responsibilities are frightening to her. Anorexia offers a solution to both problems by providing a means of "gaining control" of her life (especially in the parental home), and, at the same time, prolonging sexual immaturity and avoiding adult responsibility.

Cultural/neocultural failure

Although the anorexic's conformity and perfectionism often lead to cultural success (*viz.*, social status), she tends to see herself as a "failure". She is never thin enough, beautiful enough, bright enough, or successful enough, and deep-seated frustration results with attendant feelings of rage, anger and powerlessness. Feminist theory is enlightening on this issue.² Epstein, for example, states that young women in modern society often have trouble expressing their anger, and the anorexic responds by turning her anger inward and converting it into disgust for her body and its relationship to food.²⁷ Also, the young woman who rejects the high cultural expectations placed on her may assert power and express rage by "controlling" her body through self-starvation:²⁸ this may be an especially effective way of asserting power in the enmeshed mother-daughter relationship.

Due to the extremely high social (cultural) and educational (neocultural) aspirations of the anorexic and her family, fear of failure may assume awesome proportions. The anorexic desperately desires success both culturally and neoculturally, and any hint of failure is experienced as devastating. Her cultural success comes largely through social conformity and perfectionism, but she drives herself to succeed in the intellectual/educational realm as well. Failure in the educational realm is especially problematic for several reasons: e.g., classroom failure is based on objective standards and cannot be easily rationalized; classroom failure is public and may involve humiliation in front of peers; classroom failure may jeopardize future academic and occupational success; and the anorexic family places extremely high value on academic success.

Thus, the anorexic exists in a pressure cooker of high expectations that does not offer ready avenues of escape. However, just as self-starvation may suppress reproductive strivings in the biological realm and thereby allow escape into immaturity, similar purposes may be served *vis-a-vis* success strivings in the cultural and neocultural realms. This is most certainly true when thinness degenerates into emaciation and the disorder comes to overshadow everything else in life ... including cultural striving.

Biological failure

Anorexia is essentially a disorder of biological failure that eventuates in premature death for a minority of cases.^{2,24} Anorexia leads to failure in both the proximal health realms and the ultimate reproductive-fitness realms. The disorder is associated with maturational delay, amenorrhoea, infertility, physical emaciation, partial diabetes insipidus, endocrine dysfunction, abnormal hypothalamic function, and a variety of hormonal dysfunctions.² The anorexic's debilitated physical condition is the most glaring evidence of biological failure, but her depression, hyperactivity, obsessiveness, perfectionism, sexual insecurities, and confused sex role identity are liabilities as well. In sum, the anorexic is very poorly equipped to compete reproductively with other women, either in the mating arena, in egg production, or parenting, and she is in a poor position to achieve biological goals in general.

Conflicts between biological and cultural success

The *conflict* between the separate impulses for biological success and cultural/neocultural success loom large in our approach, as they do in most other evolution-based theories. The magnitude and direction of the conflict between biological and cultural strivings serve to color the relationships between predisposing pathology and aggravating conditions, and they essentially tell us the likely courses a person's life may take. For example, a person predominantly devoted to biological success is likely to focus on proximal matters of health and ultimate matters of reproductive success, whereas the person more focused on cultural/neocultural success will direct his/her energies toward "proximal"

occupational training and education and "ultimate" success (e.g., money, power, and prestige) in the cultural/neocultural realm.¹ The obvious implication here is that allocating the lion's share of resources to one realm (biology versus culture) will produce a shortfall in the other. However, a few fortunate individuals are able to achieve an optimal balance between biological and cultural striving, but there are an unfortunate few who fail to achieve success in either realm (e.g., the mentally retarded or severely ill physically or mentally).

The dynamics of biology-culture conflict are dramatically played out in anorexia nervosa. In sum, the dynamics of the disorder revolve around powerful family and patient needs to achieve *cultural success* at all costs, and one of the anorexic's primary strategies is to suppress biological processes while obsessively pursuing cultural ones. The anorexic not only pursues *cultural success* (e.g., social status, admiration or political power), but she also avidly pursues *neocultural success* through advanced education and, ultimately, through employment in intellectually prestigious occupations. Condit tells us that anorexia may be directly related to level of education, and one study of 76 anorectic individuals in northern England found no clear correlations between social class and the disorder, but *level of education* proved to be a strong correlate.³¹ Success in college requires deferment and suppression of many needs and drives, often including those dealing with biological and reproductive matters. Higher education has traditionally been a masculine endeavor, and the anorexic female may, at one level, be trying to emulate the male body to better compete in this male world.³¹ It is also possible that a thin body implies "persistence and effort" in our fast-paced, urban meritocracies, and "there is no reason thinness should not be aimed at admissions officers and employers"^{26(p.539)} and any others who might further the anorexic's quest for success.

A disorder profile for anorexia

We have seen that anorexia nervosa can be analyzed in terms of the components listed in Table 1. We proceeded on the assumptions that certain persons are physically and psychologically predis-

posed to anorexia, and whether and to what degree the disorder is expressed is a function of various aggravating factors. One of our implicit goals was to "profile" the disorder.

In simplest terms, the Disorder Profile formula reads:

Disorder Profile = Predisposing Conditions + Aggravating Conditions or, **DP = P + A**

The expanded formula reads:

DP = [Predisposing conditions] + [Mismatch] + [Deviance] + [Failure] + [Conflict]

or, **DP = [P_{phy} + P_{psy}] + [CM + NM] + [CD + ND] + [CF + NF + BF] + [(CS - BS) + (NS - BS)]** where,

CM = Cultural mismatch; NM = Neocultural mismatch; CD = Cultural deviance; ND = Neocultural deviance; CF = Cultural failure; NF = Neocultural failure; BF = Biological Failure; CS = Cultural success; NS = Neocultural success; BS = Biological success

If sufficient information is available for each of the components in the formula, then any disorder may be profiled on a theoretical basis, and individual patients may be profiled as well. Our goal here is to profile anorexia nervosa at the level of the disorder. The first step involves estimating the magnitude of each of the components in the formula on a 9-point scale, and the second step is to present the resulting profile in graphical terms. We are presently developing formal criteria for making component estimates, but rough estimates may be made here to illustrate the process. The following estimates (Table 2) were conjointly made by the two authors, assuming that "5" on a scale of 9 is average magnitude with "9" being the extreme upper pole and "1" being the extreme lower pole. In theory, then, a "normal" person should hover around "5" on the various components, whereas a disordered person (e.g., anorexic) would fluctuate toward the extreme of many or most of the components. Figure 1 shows the component estimates in graphical form.

See Figure 1 and Table 2 on following page.

Table 2

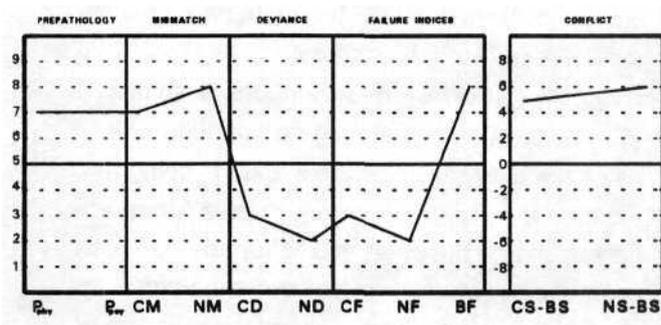
Early Phase Anorexia: Components and Ratings (Component followed by rating)

Predisposing Physical Pathology7
Predisposing Psychological Pathology7
Nature-Culture Mismatch7
Nature-Neoculture Mismatch8
Cultural Deviance3
Neocultural Deviance2
Cultural Failure3
Neocultural Failure2
Biological Failure8
Cultural Success7
Neocultural Success8
Biological Success2
(CS-BS)+5
(NS-BS)+6

Notes:

1. Ratings are for early phases of condition. Late phase ratings would be somewhat different.
2. Ratings were made on a 9-point scale, with 5 representing the hypothetical "average" or mid-point.
3. Ratings reflect mutual agreement by authors on each rated component.
4. Cultural Failure, Neocultural Failure, and Biological Failure ratings are the mathematical complements of the corresponding Success ratings. Thus, if Biological Success receives a rating of "6", then the Biological Failure rating must be "3".
5. Note that Cultural and Neocultural Deviance ratings are identical to corresponding Culture/Neoculture Failure ratings. Thus, in the present instance, low deviance (high conformity) is associated with low levels of Cultural/Neocultural failure. This is not always the case, however; a person may highly conform culturally and still fail (e.g., high conformity: low intellectual ability).

Figure 1
Disorder Profile for Early Phase Anorexia



As reflected in Table 2 and Figure 1, early phase anorexia nervosa is a disorder that is "out of the norm" on all of the component estimates. Substantial predisposing pathology is implicated in both the physical and psychological domains, which is aggravated by considerable mismatch tension, hyperconformity or "nondeviance", low but psycho-

logically significant cultural and neocultural failure, and massive conflict between biological and cultural strivings favoring the latter. Diagnostically, this might be the expected pattern for someone at high risk for anorexia, and, psychotherapeutically, emphasis on mismatch issues, conformity-independence issues, and biology-culture conflict would be indicated.

We hope our early attempts at evolution-based disorder profiling is of interest to ASCAP readers, and we welcome critical commentary and suggestions.

References: page 20

[Editor's Note: You may contact the authors via Dr Kent Bailey, Virginia Commonwealth University, Department of Psychology, 806 W Franklin Street, Richmond VA 23282-2018.]

ARTICLE: Is the shivering metaphor useful for more than depression?

John Price has advocated the use of the shivering metaphor for helping patients with involuntary subordination strategy (ISS) reactions, i.e., depression.¹ Recall the following familiar table:

<u>Stimulus</u>	<u>Cold</u>	<u>Perception</u>
Upper brain-body level	Put on clothing	Voluntarily give way
Lower brain-body level	Shivering	ISS (Depression)

Thus, if one is cold in a chilly room with scanty clothing, one does voluntary, thoughtful, plan-oriented behavior: one turns up the thermostat or puts on warm clothing that either ameliorates the current cold or prevents anticipated coolness.

In this report of a brief segment of a patient's treatment, I tell how a teacher (AU) was helped by the shivering metaphor not because she was depressed or defeated at the time but because she had experienced another automatic reaction. I propose in a challenge to John Price and Leon Sloman that the shivering model is a general statement useful for more than the ISS alone and am interested in how this generalization may take us further. Or is there nothing new about the formulation? Will those interested in the ISS tell us that AU in the first session reported did have an ISS despite my calling it something else? First some more words of explanation.

People reacting to hostility and aggression with depression may be activating an ancient behavioral and physiological body plan (ISS) parallel to what happens with danger, as when the body reacts with the well-examined freeze, flight or fight (FFF) reaction. Both are what we have called basic plans. Of course they can occur together, as with an anxious depression. Leon Sloman has often focused our discussion - note his response to Mike Waller in this issue. He tells us of people taking charge of their reactivity and preventing/ameliorating it by deliberately "giving way" - thus, if one is having to knuckle

down before an antagonist and is consequently depressed and defeated, one can consciously appraise the fact of the loss and like forestalling the shiver, stay "in charge", by deliberately losing - but doing so without the ISS.²

I have found the shivering metaphor of clinical utility for not only for the circumstances of agonistic threat. In my view, ISS (depression) is only one of many involuntary and difficult-to-control body responses. One of them, experienced by a patient I have in ongoing treatment, is that of dissociation. For AU, the shivering equivalent was that her mind would involuntarily depart the scene at a time when she should have been paying attention. I will tell that story in the form of notes for two sessions in Fall, 1994.

Background: AU is 46 years old, divorced, and an elementary teacher of special education. School policy has changed from last year to this. Formerly she was in charge of her own classroom with a teaching assistant; now with mainstreaming, she visits many classrooms to provide episodic instruction and helps teachers plan for children in special education.

Several years ago, she was referred to me from another psychiatrist who had used a descriptive approach with medications tailored to her symptom picture, mostly defined as depression with anxiety features. I have seen her once weekly though this has diminished in the last year. Working with her, I found that she also had obsessive-compulsive disorder and dissociative identity disorder (not otherwise specified - she doesn't have multiple personalities, for instance, but does dissociate frequently). Her pharmacological treatment at this time is clomipramine 250 mg each evening and clonazepam 0.5 mg three times per day.

Salient features of her past include her father's death

from cancer when she was five y.o. and when her mother was pregnant with her only full sibling. She was very attached to the lost father (AU described her mother as herself quite needy and often critical); working through the loss of father occupied considerable session-time. She told of a mysterious sleeping posture that she would characteristically resume for comfort when stressed. Over time, this turned out to be the posture she had assumed during her last visit to the father, that accommodated to his deathbed oxygen tent. Her former husband had protested when she would attempt to arrange him in a counterpart posture for what were then obscure reasons.

AU's mother later remarried and had two more children. Unfortunately, the stepfather abused AU sexually and subtly harrassed her over the ten years prior to college (he "could invade her with his eyes across a room"). AU felt constrained from protesting for many reasons, including the worry that she might hurt her half- siblings (his children). Later her husband whom she married in part to escape the parental home overtly demeaned her over the two decades of their marriage. The marriage ended about three years ago and her children are doing well. An older boy is satisfactorily married and has a baby; a daughter has newly moved to college.

Note of 9/29/94: She said she hated her job, liked being alone and at home (without her daughter, newly out of the house). She likes being able now to do what she wants when she wants; however, she was distressed by one of the leaders of her therapy group of incest survivors which had met the previous night. The doctor suggested that AU had to be careful not to become agoraphobic. AU didn't like it that someone would interfere with what she liked (staying at home). We discussed a bit the idea of solitude as a positive state but also the issue of whether there is something to be avoided in her life. She protested, she does go out! -- but admitted relief of distress when home.

She complained of bad dreams: one featured her in a cemetery with her youngest aunt, Louise, who is 6 years older and with whom she lived (in the mater-

nal grandparental home) for about three years after her father died and before her mother remarried (patient's ages about 6 to 9 years). In the cemetery she could see in neon and colored lights a big road sign saying "repent!" and then a coffin emerged from the ground and flew out, going past and behind Louise's back. The patient said to Louise, "Was that Pawpaw?" - meaning maternal grandfather. The dream was fast moving, highly pressured and science fiction-like.

I asked what came to mind about the dream. Her associations connected to her idealized grandfather; mother moved away because the grandparents "spoiled" her - meaning indulgence. Pawpaw was one-legged and had heart disease but would baby-sit her; she doesn't know where younger brother was, but remembers herself playing near Pawpaw's chair. She roomed with Louise who at 15 had permission to drive the car as long as the 9 y.o. AU went with her; the patient was the implicit chaperone -- Louise, they seemed to feel, wouldn't do anything wild with the younger child with her. But Louise pledged the patient to secrecy and they went repeatedly to Five Corners, a place where people drank beer. The patient couldn't see what the fuss was about: what was wrong with it? People were having a good time and treated her nicely, admiring her as Louise's niece - they bought her cokes and candy.

But the time came when Louise's parents seem to have found out. The patient recalled everyone took Friday night baths on the back porch (no running water). She saw Louise in her bath with bare shoulders, indeed with great mysterious welts on her shoulders and back. AU asked "what is that?" and Louise snapped at her, was angry at her; they were never close again for reasons that have puzzled and distressed AU. Louise went on to have life-long problems, including alcoholism. Physically the mother moved to their own place soon after. But it has been confusing ever since: how, the patient wondered aloud in the session, could Pawpaw have beaten her? Was he even strong enough? And what was so very wrong about Five Corners?

The patient went on to discuss why she hates her

work. Instead of her own classroom, she now rotates from classroom to classroom to do her classes in a dispersed manner. She found out one of "her" students had been dismissed for behavior problems long after the occurrence. Last year she would have known about this immediately and been deeply involved with every thing that happened. Perhaps she is feeling the responsibility still, she said, even though she no longer has it. But she is puzzled, unsure what is going on.

She has trouble with memory, as when the principal asked her to do something: she had to piece it together from her fragmentary notes and from what others recalled (though she was embarrassed to have had to ask as it revealed her problem). This happened again today. The patient slowly and indirectly discussed that the principal wanted her to inspect what other teachers were doing and to then write something on their evaluation reports.

I noted that she must have been dissociating; she agreed: she was aware of it at the time, labeling it, wishing that she could stop. She asked directly, "What can I do?"

I reiterated the shivering model as perhaps helpful:

Stimulus	Cold	X₁
Upper brain-body level	Thermostat switch	X₂
Lower brain-body level	Shivering	Dissociation

That is, when one is in a cold room without many clothes, one has an automatic response of shivering. But using one's conscious planning capability, the automatic response can be countered, prevented or ameliorated if one turns up the thermostat or puts on warmer clothes. In parallel, dissociation responses of which she is very aware might be countered if she knew what the stimulus was and if she would counter it with conscious planning.

Thus I suggested that the lower level response was in response to a perceived parallel with an original

traumatic response. Very severe fearfulness may be reacted to with dissociation (Bruce Perry, director of Baylor's child psychiatry division recently suggested at a UTMB Grand Rounds that the traumatized child

... dissociation responses of which she is very aware might be countered...

reacts with a flight-fight-freeze response or with dissociation with some children typically reacting with FFF and other children with dissociation). Of course, both

responses seem well represented in many patients.

In this patient, then, X₁ seems to have been the trauma of realizing that her beloved Pawpaw had beaten Louise; he was idealized and weak, yet he seemed to have brutalized her aunt and friend, who in turn rejected the patient then and for the rest of their lives, as though the patient herself was somehow responsible. Now as she was expected to report on her peers, she felt the same confusion and distress and loss - not only of her aunt but of her Pawpaw-replacement of her father (her mother moved from the parental home soon afterwards). Perhaps she dissociates now as she did then, as she had initially and protectively experienced that catastrophic event. To summarize I suggested to AU that X₁, the stimulus, was the school task demanded of her wherein which she had to report on her fellow teachers, a constellation of elements that for her echoed the situation of Louise and Pawpaw.

AU was interested in this idea but pessimistic that realization alone would abolish future episodes of dissociation. How, she asked, could she prevent future episodes of mind-blanking when her supervisor made suggestions? She emphasized again how bad her state was, telling how she now avoided the world, that she preferred being home alone with her fantasies; for example, again she had resumed the familiar sleeping posture comfort associated in past sessions with the loss of her father (to me, this emphasized the power of the loss of Pawpaw who had immediately replaced her dead father).

I decided to try to help her with the upper brain-body

level (X_2) by deploying the shivering metaphor in concretely symbolic terms: I suggested that she might carry with her a symbol of the thermostat switch. Next to her on the table was a large winged paper clamp. I had her pick it up and bend one of the wings into another position, which clicked (as does a switch). I suggested that the next time that she was conscious of a dissociation experience, she should reach into her purse and click one of the wings into another position, as though she were switching on a thermostat and therefore avoiding further shivering. She said with a sense of relief that she would try it. We agreed to meet five days later in view of her increased distress.

Note of 10/3/94: She spoke immediately of using the winged clamp for restoring equilibrium, not at work where it was awkward, but at home when she found herself not able to concentrate when correcting papers. She got it out, clicked the wing, and thought on her confused feelings about her grandfather; after a short time, she was able to concentrate on her work again. She related that it was important that it came from my office, as manipulating the clamp brought her into the therapy mode of thinking. As she spoke, she held it in the session. Because it was big, I offered a smaller version that I also had available; she accepted because she could use the smaller replacement more subtly.

She related another dream: she was on an open expansive surface perhaps indoors or out; she was able to threaten her step-father with a gun, saying to him that she would shoot him and meaning to as she spoke, telling herself, "go ahead." But he laughed at her saying that she wouldn't because she would get into trouble if she did. She kept retreating and he kept coming, but there was no wall she would back into and be cornered. She kept on backing up and was doing so when she awakened.

She talked for the rest of the session about the planning for Thanksgiving and for her maternal grandmother's upcoming 90th birthday. Her mother and mother's sisters were continually fighting and unable to get along in the planning. Her mother ordered her to make plans: when, who, timing,

demanding as much time from her as possible. AU was docile when talking, but furious after hanging up. Her daughter preferred to spend Thanksgiving at home and not make the 13-hour trip.

I compared the situation with her mother with the dream scenario, as she was feeling backed into a corner; I suggested that she could tell her mother that she simply couldn't commit at this time and that she and her own children would make their own specific arrangements. She wished she could remember exactly how I said it. I pointed out that the ruts of submission were also parallel to shivering and that it might help to flip the switch when she thought about encounters with her mother.

Follow-up: She has continued to use the winged paper clamp; I saw it clipped to her handbag on subsequent visits; without touching it, she sometimes *thinks* of it - with relief - when beginning to dissociate. She decided with great conflict and ambivalence that she would *not* attend Thanksgiving with her family and would not attend her grandmother's ninetieth birthday. She was aware that she had disappointed her siblings and indirectly her mother but to her surprise some days later, her mother called her spontaneously (a rare event) and was completely appropriate and non-confrontative about the refusal to attend the family event.

In a still further follow-up from a November 29, 1994, session, the patient told me that it had been a very good Thanksgiving, one in which she had experienced happiness: relaxation, unanxious, undepressed, comfortable with her daughter visiting or alternatively alone as when her daughter was with her friends. Such a sense of being comfortably in charge of her life has been extremely rare.

Discussion: Sometimes, because of the automatic nature of involuntary responses, the question of "what is the stimulus analogous to the cold?" is hard to decipher. Why might this be true? We recall the power of Freud's concept of the unconsciousness, but in sociophysiological and basic plan thinking we have used a different approach. John Price, for example, has emphasized that the submitting,

would-be defeated person signals a deception to his or her antagonist: the postures, mind-set and Beck triad characteristics of the depressed person emit a more convincing signal if the person is truly unconscious of a reality that he or she is hunkering down in order to survive and fight another day. But since the ISS is not usually adaptive in the present time, becoming aware of its nature as a response to an agonic threat can be highly useful: the responding person no longer manifests the evolutionary ancient program, an involuntary response which might be quite harmful (hence earning the designation of psychiatric illness), but instead devises a conscious, newly-devised, more thoughtful response.

In psychotherapy experience more generally, rendering unconscious material conscious seems to help. Why is this the case? Perhaps the mode of operation is that "insight" - what we take for granted we know something about - is really a delineation of how an involuntary response on a lower brain-body level is transformed by its awareness. Then the human brain can invoke its usual thoughtful methods on the diagram's upper level. AU's dissociation was more than usually handicapping, however, because it kept distancing her from awareness. The palpable symbol of the paper clamp made it possible to deploy a little bit of awareness - memory of touching it being the thing to do - upper level reinvoking.

The two sessions with AU perhaps provide some contrasting lessons: the involuntary response of the first session indeed seemed dissociation, but the theme of the second seemed to be the classic ISS with which we are familiar: she perceived herself as the loser of a conflict with her mother (symbolically represented as her stepfather in the dream) despite having some strength (she had a gun in the dream). But when she was later able to be strong against her mother (not going to the reunion), she found the

mother in the follow-up phone call to be conciliatory and friendly; she needed to be dominant over her mother and when this happened, the situation turned hedonic more than agonic. Will John or Leon tell us that the conflict at work was an ISS?

We referred to dissociation operating in first session, but I am curious to hear from fellow ASCAPians as to what extent was this in fact also an ISS with the patient responding to her supervisor/Pawpaw with a defeat response, or yielding or submission? This bears on the definition of ISS. For example, Leon Sloman seemed to expand his definition of the ISS in his reply to Michael Waller this issue. He wonders if the ISS helps human learning. This may expand ISS unduly. A child is usually a good audience - yearning for adult input. This is voluntary, *not* involuntary subordinate strategy. This is the non-pejorative lowerness stance of Birtchnell, which I believe to be quite compatible with ISS thinking.

So in summary, I leave some of the following questions for continued discussion: (1) am I correct that involuntary responses other than ISS are responsive to the shivering model? What kinds? How many? (2) Was the dissociation that AU exhibited part of an ISS or are the two quite separate mechanisms? (3) What kind of evidence should we use to define and dissect different involuntary responses for comparison and contrast? (4) How we can define genome codings, brain mechanisms and phylogenetic history to make such definitions and dissections? (5) How does this shed light on mechanisms of consciousness and unconsciousness? (6) Do considerations such as these help the "false memory" *versus* "recovered memory" debate? Memory these days hinges quite rigidly on the tape recorder metaphor, whereas this shifts the issue to response sets and the use of the evolved human brain.



ABSTRACTS & EXTRACTS ...

Borrill J & Stevens D: Understanding human violence: The implications of social structure, gender, social perception and alcohol.

Cattanach BM & Jones J: Genetic imprinting in the mouse: implications for gene regulation.

He Fu-Chu & Wu Zu-Ze: Principle of concerted evolution of cytokine-receptor and verification of its corollary.

He Fu-Chu & Wu Zu-Ze: The principle of concerted evolution between interacting proteins -- Darwinian selection at molecular level.

He Fu-Chu & Wu Zu-Ze: The principle of modulated evolution between cDNA coding region and nontranslated region -- non-neutral evolution at molecular level.

Borrill J & Stevens D: Understanding human violence: The implications of social structure, gender, social perception and alcohol. Criminal Behaviour and Mental Health 1993;3:129-141.

This paper reviews Gunn's (1991) model of violence and suggests aspects of the model that require further development and/or modification. Aspects of social perception are discussed along with an evaluation of recent research into the effects of alcohol on decoding. It is argued that deficits in decoding negative emotions, possibly exacerbated by alcohol, may lead to distorted perception of the

cues that signal and maintain power and dominance and hence may make a small but crucial contribution to violent interactions. It is further argued that Gunn's model does not take sufficient account of the relationship between gender and violence; this is discussed through an examination of power and social structures. A comparison of hierarchical and non-hierarchical structures is seen as crucial to this understanding.

Cattanach BM & Jones J: Genetic imprinting in the mouse: Implications for gene regulation. J Inher Metab Dis 1994;17:403-420.

Genetic imprinting specifies a germline marking that subsequently results in the repression of one or other parental allele at some point in development. Genetic manipulations to generate maternal and paternal duplications of specific chromosome regions have been used to screen almost the entire mouse genome for evidence of imprinting. As a result, 15 imprinting effects involving 10 regions on 6 different chromosomes have been detected that range from early embryonic lethalties to various growth and developmental defects seen only after birth. Genes with important roles in development therefore appear to be involved. Diverse studies have identified four imprinted genes, all of which show monoallelic expression in some, but not necessarily all, tissues. A correlation with methylation is indicated but the pattern of methylation is not consistent for each of the genes; methylation is therefore unlikely to be the imprinting signal. Methods being used to identify further imprinted genes are summarized and some of the difficulties posed are indicated.

He Fu-Chu & Wu Zu-Ze: Principle of concerted evolution of cytokine-receptor and verification of its corollary. Chinese Science Bulletin 1993;38(15):1300-1304.

Cytokines mediate their pleiotropic actions by binding

to and activating their cell-surface receptors. So far, people have learned much about their biological characteristics, biochemical profile, and the interaction or modulation between cytokines and their receptors as well. However, people have no idea about what relationship of cytokines with their receptors in phylogeny exists.

In the past decades, molecular evolutionists focused on the homologous analysis of single protein among lineages (species) or that among homologous proteins, ignoring the comparative study of molecular evolution among function-related proteins, i.e. paying little attention to the role of biological functions of proteins in molecular evolution. With Dayhoffs method, He Fu-Chu and Wu Zu-ze comparatively studied molecular evolution of multiple hemopoietins, demonstrating the correlation of molecular evolutionary pattern of hemopoietins with the developmental hierarchy of hemopoietic cells. In this note we have further uncovered the principle of concerted evolution between cytokines and their receptors, and verified the corollary derived from this principle and the correlation of molecular evolutionary pattern of hemopoietins with the developmental hierarchy of hemopoietic cells.

He Fu-Chu & Wu Zu-Ze: The principle of concerted evolution between interacting proteins - Darwinian selection at molecular level. Chinese Science Bulletin 1993;38(16):1396-1401.

The neutral theory raised by Motoo Kimura in 1968 asserts that "the great majority of evolutionary changes at the molecular level, as revealed by comparative studies of protein and DNA sequences, are caused not by Darwinian selection but by random drift of selectively neutral or nearly neutral mutants".

It is more and more evident that the interaction between the interacting proteins, such as ligand-receptor, enzyme-peptide inhibitor and subunit-subunit, plays a key role in their function and their

regulation. So far, people have learned much about their biological characteristics, biochemical profile, and the interaction or modulation mechanisms between the interacting proteins. However, the existing relationship between their evolution still remains unclear. In this note, on the basis of the principle of concerted evolution between cytokines and their receptors described previously, we parallelly analyse the molecular evolution of 3 kinds of interacting proteins. The results extend the principle of concerted evolution from the pair of cytokine-receptor to all the interacting proteins, indicate a drawback of neutral theory, and uncover a part of Darwinian selection in molecular evolution.

He Fu-Chu & Wu Zu-Ze: The principle of modulated evolution between cDNA coding region and nontranslated region - non-neutral evolution at molecular level. Chinese Science Bulletin 1993;38(16):1391-1395.

A cDNA encoding a protein is composed of coding region and nontranslated region (NTR). There are two parts of NTR, i.e. 5' NTR or 3' NTR, upstream or downstream the coding region respectively. According to neutral theory of molecular evolution, the following expectations might be true at cDNA level: (i) evolutionary rate of NTR is higher than that of coding region; (ii) synonymous substitutions in coding region evolution are more than missense substitutions; (iii) transition substitutions are more than transversion substitutions in all mutations. Recently, we discovered two principles of molecular evolution: (i) evolutionary pattern of hemopoietins correlates with the hierarchy of hemopoiesis; (ii) cytokines are evolved together with their receptors in a concerted fashion. It has been shown that these two principles could not be covered by neutral theory. The expectations at molecular evolution of cDNAs encoding 36 kinds of proteins have been analysed among species.

Another reminder, Reader: 1995 subscription fees are due!

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