

# ASCAP NEWSLETTER

## Across-Species Comparisons And Psychiatry Newsletter

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A tenet of phylogenetic theory is that evolutionary conservation of function is accompanied by conservation of essential structure. Waugh, Green and Pace [1]

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For the philosophy guiding this newsletter, see footnote on p 10 [2].  
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.

Notes: As RG could go to neither the Evolution and Human Behavior meeting in Evanston, Ill nor to the International Human Ethology meeting in Edinburgh, let ASCAP invite summary comments or other contributions from those who did attend or/and present. For their unique perspectives, roving reporters for the two meetings include Kalman Glantz for the American side of the Atlantic and Paul Gilbert for the English. Both graciously agreed to help ASCAP out.

Feature: RG describes a "basic plan approach" to the biology of psychiatry in this issue (this essay begins after Kalman Glantz's and continues after Marc Galanter's letter).

Letters: 7/6/1989

I was interested to see that Randy [Nesse] has taken up my idea (ASCAP Vol2 #7 p8). His suggestion is a fascinating one, which had not occurred to me. I am sure that he is right when he observes that 'babies who are assured of a constant and sufficient supply of milk will spit up the least' if only because the literature suggests that 24-hour

*demand-fed babies in fact consume little more milk than those fed less continuously, and so presumably have more opportunity to digest it at leisure. Nevertheless, as he rightly says, this is a consequence of hasty feeding. It makes one wonder what implications this insight might have for eating disorders which occur later in childhood.*

*Christopher Badcock, V London*

July 24, 1989

I think the interface between our [KG/RG] interests is much simpler than it seemed at dinner [Cambridge, 7/11/89]. John and I wrote [3] about the response of essentially normal but vulnerable people to the changed environment. You are interested in the genetic predispositions (personality dimensions) underlying vulnerability. You are also interested in predispositions to mental illness, a subject we didn't deal with. . .

There's a good question here: is there a continuum between the predisposition to mental illness[es]? I see the schizophrenias as separate entities related to specific genes. I'm unsure about manic-depression. I'm aware of the interest in the connection between mania and dominance, but I think it is likely that the bipolar gene releases dominant behavior that would otherwise; be not: be expressed. In other words, it is not merely an exaggerated sense of dominance, but an essentially unrelated gene that happens to affect dominance. . .

*Kalman Glantz, Cambridge, MA*

Basic plan approach to the biology of psychiatry. by Russell Gardner, Jr. (Part 1): Kalman Glantz's letter: This first good springboard for the feature essay re-emphasized for me the clarifying importance of a basic plan approach to psychiatry. Basic plans are biological structures that underpin other structures derivative from them, structures in both cases that determine function.

That said baldly to begin, KG is correct: I am interested in "predispositions ..underlying vulnerability" to mental illness (and also with him and John in normal people with their vulnerabilities). Both exemplify variability, eg, some individuals exhibit mental illness or troubles and others do not. This is parallel to saying that people have different limb dimensions, eg, shoe size. Populations show variability in traits, as well studied in genetics.

But I suggest in addition that another useful approach relates to invariances that populations show, such as having four limbs. Only rarely do individuals have other than four limbs. This "basic plan" of four extremities with an endoskeleton gets pretty well expressed with land-based vertebrates, even with embryo snakes, but not in animals that preceded vertebrates. With respect to this basic plan, a population will exhibit variability superimposed upon this invariance: in orthopedic disorders of limbs, healed fractures and infections are exhibited differently by different individuals, if at all.

Of course knowing the basic plan for vertebrates in general and for humans more specifically makes great good sense in thinking about these injuries: classification, pathogenesis, treatment all are helped. Indeed, it makes such good sense that these are taken-for-granted and obvious: the bony basic plan is a well studied well understood part of our medical repertoire for orthopedics.

Wouldn't it be helpful to know what bases of ordinary function underpin psychiatric disorders? Shouldn't they be studied and understood? These are taken for granted (we know about them from experience as we know our limbs from using them), but they are not understood nor well studied.

The basic plan approach attempts to consider - as fully as we can at this time - foundations of this kind. I think we can safely assume there are basic plans that do underlie the biological variability we think of as mental illness. These will be delineated in detail as the revolution in molecular genetics continues.

Kalman gets at this in his second paragraph: in considering a possible vulnerability gene for bipolar illness that is independent of possible genes for dominance, he addresses this issue as I've been thinking about it since 1981. Indeed, the concept of psalic [2c] was meant to focus on structural invariances that underlie communicational states that get stimulated into action with particular stimulus constellations. These invariances are composed in turn of long established neuronal sequences/networks, using characteristic molecules, with which each of us is born - along with our non-human "relatives" to some extent. I assume that we have communality of inherited structures with, nonhuman animals. Which? how? to what extent? are major scientific questions.

In summary, I propose that invariances, parallel to four limbs and endoskeleton which are part of the motor system, are interfered with when mental illness intervenes. In parallel with the motor system, this system of basic; plans may be the body's "communicational system."

Next comes Marc Galanter's letter about a kind of problem some people experience with their "communicational system" and a review of his book about that:

Letter 6-21-89

. . . Thanks for the copies of the very valuable newsletter. It reveals a remarkable breadth of material. I'm sending you material on the book, as requested (Galanter M: *Cults: Faith, Healing and Coercion*. NY: Oxford V Press, 1989.) By the way, the reviewer [see below] has misconstrued the sociobiologic formulation. My point was that social affiliativeness evolved as an adaptive trait because of the inclusive fitness it conferred, not affiliativeness with cults per se. Marc Galanter, NYU, New York

Dr Galanter's book was reviewed by Silk M: Outsiders Welcome, New York Times Book Review. June 18, 1989; the review is largely quoted here:

A few weeks ago the United States Supreme Court let stand a ruling .. under which the Rev. Sung Myung Moon's Unification Church will have to stand trial for brainwashing two former church members. At the same time, the man who "deprogrammed" them will himself be charged with conspiring to violate the member's civil rights. In this and similar cases, the critical question turns on how individuals abandon their previous lives and attach themselves to an organization possessed of novel practices and beliefs.

Anyone wishing to understand the psychodynamics of such affiliations should pick up "Cults." .. Galanter, who teaches psychiatry and directs the division of alcoholism and drug abuse at [NYU], has been a student of cult-like behavior for the better part of two decades; his book represents a thoughtful and provocative summation...

...[The term] "cult" is less appropriate ... than the more neutral "charismatic group," which covers, but is not limited to, explicitly religious organizations ... Both Alcoholics Anonymous and the Italian Red Brigade possess strongly held belief systems, put a premium on social cohesiveness and provide feelings of well-being. Whether one's distress stems from neurosis, addictive illness or political conviction, charismatic groups spell relief.

..[MG] makes effective use of systems theory to show how a cult functions as a social organism - transforming outsiders into insiders, monitoring their activities, seeking feedback from the outside world and protecting its boundaries. Conformity is generally assured through the manipulation of psychological distress rather than overt coercion. The charismatic group catches members in a psychological pincer, using heavy demands to induce anxiety that members then depend on the group to relieve.

The author's effort to place cult membership in sociobiological perspective is less persuasive. If the propensity to belong to charismatic groups has been bred in by evolution, why do proportionately so few of us join them? ...[MG] has little to say about why some people enlist and others don't. Of greater concern for him is why groups like Synanon, the California therapeutic community, and Jim Jones's People's Temple go bad because, for all the dangers, he remains appreciative of the good cults do. Indeed, it is possible to detect behind the author's clinical prose, a certain regret that the discontents of civilization have supplanted the unroutinized charisma of days gone by. ...

The book's centerpiece is a long chapter on the Unification Church, which [MG]..has followed closely for years. Church leaders provided him with a remarkable degree of access, and it is worth the price of admission to read his account of how Americans, born in a culture of romantic love, could readily accept the mass arranged marriages presided over by Dr. Moon....

Early on, the author quotes William James's criticism of efforts to reduce religious experiences to physical ailments, and asks, "Why wasn't James' call for attention to the psychological side of such religious phenomena more actively heeded?" But James heeded no such call. He was interested, rather, in preserving the study of religious experience from all scientific reductionisms. Dr. Galanter preserves his clinician's detachment in assessing the impact of charismatic groups on the psychological well-being of their members. But there is more to these experiences than is dreamt of in his philosophy. (End of review).

(Part 2) *Reaction to Galanter & Silk:*  
As you can see, the review is positive except for Mark Silk's distaste for scientific reduction as a thinking and investigative tactic. This may be fine for a reviewer expressing anti-sociobiologic bias to a general audience, but to get on with the work of science, one needs comfortably to reduce phenomena at times; of course, there is nothing wrong with nonreduced thinking at other times. Both are needed in our thinking repertoires.

As Silk points out, MG uses systems theory effectively; systems thinking allows the thinker/investigator to consider the varied levels as each important, sometimes evaluated independently and sometimes together. Indeed, at this time, a useful scientific approach might simplify still further, even more than Marc Galanter did -- although let me qualify that I'm working from a knowledge of MG's book that you also now have from the NY Times review (I haven't myself yet seen the book, but decided not to delay this essay until that time).

I suggest that an individual person's need for cult membership as outlined by Marc Galanter, in what Mark Silk calls "charismatic groups," stems from the activation of a biological "basic plan" which I have been calling "alpha-reciprocal (AR) psalic." Now let me develop this step-by-step with terminology issues raised by the two Marc[k]s (This is not, incidently, a new form of Marxism!)

For Mark Silk's purposes, the term "cult" is too narrow. In a lumping rather than splitting approach, he implies that there may be many besides religious cultists who experience a positive state of feeling supported, being at one with the others of a group, as well as involved in a cause. Many groups "spell relief" for members. Such compelling power for such memberships

suggests a distinctive biological activation in each person's body.

More on terms: for the purposes here, I have a problem with "charismatic groups." First, as a biologist I use the individual as the unit of comparison, not a group of individuals. Secondly, charisma is located in a leader, not in group members, whom, MS implies, are responders to the leader's charismatic influence, eg, Rev. Moon. However, a leader doesn't always need to be directly seen or experienced (the founders of AA have been dead for many years).

Thus, followers reciprocate charisma; without them charisma in the leader can't be defined, although they may not themselves possess charisma (they may, however, transmit leader effects). I emphasize this because one cannot assume that the biology occurring in a leader when actively leading also occurs in the follower; rather, these biologies may be complimentary or reciprocal, related obviously, but different; how these different body states are and are not related should be aims of priority research.

Let us turn now briefly to the "biology of leadership:" In ASCAP Vol I #10 p5, I outlined the idea that demonstrating "disorders of leadership" are patients in manic states, persons with anti-social personality disorders, and people in the initial states of intoxication from alcohol (also probably intoxication from cocaine and other stimulants). Such, I have speculated, are the expressions of alpha psalics [2c] that are abnormal, often expressed with bad timing and without synchronization with hoped for followers.

This is not simply "dominance" (to differ with Kalman Glantz's terminology a bit); alpha states in humans, primates and other mammals often involve responsible caring attitudes in addition to commanding behaviors; as

Paul Gilbert and the Birminghamers have emphasized, social attractiveness (Social Attention Holding Potential/Power [2d]) is a feature of alpha psalic. (Manics, incidently, are described as being attractive, eg, they typically display good spirits and a good sense of humor).

Other expressions of alpha psalic occur normally in leaders functioning well in synchronization with their followers. Such individuals may at times be characterized as "charismatic." But now to alter Mark Silk's emphasis again: whereas he "lumped" cults with a more general set, I would like to lump what he called charismatic groups with an even more general set, of individuals exhibiting AR psalic. Others that express AR psalic may include persons undergoing hypnosis or, more longitudinally and psychiatrically, patients with hystrionic personality disorders who are typically suggestable. Cult members, charismatic group members or/and other individuals may express a built-in response to stimuli provided by alpha persons. Alpha-reciprocal psalic, therefore, is the phenotypic expression of a genetically determined basic plan pre-set in the organism for such response (as well as co-response with others whose AR psalics have also been stimulated). Indeed, William McNeill in his quote below points out that leaders may be near or far but are still responded to powerfully. Some effective leaders are not charismatic. Some may be harshly dominant; others may be low key but neither especially likeable nor manifestly commanding.

Mark Silk asks about why do some and not others get involved in cults? The answer here is because people have different thresholds for whatever stimulates AR psalic in each one. A particular developmental history and recent experience may shape such responses. Note here that pos-

tulation of AR psalic frees one from the thorny problem of having to define the state only with reference to the stimulus (alpha leader physically present). Many kinds of stimuli from many forms of leader seem to work including ministers on television, orders from headquarters, written exhortations. Perhaps one could say that the system can be fooled - parallel to electrical stimuli applied to visual tract-neurons creating visual sensation or Lorenz's "imprinting" his goslings into thinking he was their mother.

This is not to say that I'm completely satisfied with my own term in that it doesn't capture the interaction among group members. Some very interesting comments on this stem from the following quote on warfare, provided by historian William McNeill (WM) who provides another description of what sounds like AR psalic [4]. He refers almost belatedly to the leader, and emphasizes much more communication with peers and the role of body sensations. His observations stem in part from his own perceptions as a soldier (see footnote reproduced as text at the end of this quote):

. .[S]uch drill, repeated day in and day out, had an., important dimension which the Prince of Orange and his fellows probably understood very dimly if at all. For when a group of men move their arm and leg muscles in unison for prolonged periods of time, a primitive and very powerful social bond wells up among them. This probably results from the fact that movement of the large muscles in unison rouses echoes of the most primitive level of sociality known to humankind. Perhaps even before our prehuman ancestors could talk, they danced around campfires, rehearsing what they had done in the hunt and what they were going to do next time. Such rhythmic movements created an intense fellow feeling that allowed even poorly armed protohumans to attack and kill big game, outstripping far more formidable rivals through efficient cooperation. By virtue of the dance, supplemented and eventually controlled by voice signals and com-

mands, our ancestors elevated themselves to the pinnacle of the food chain, becoming the most formidable of predators.

Military drill, as developed by Maurice of Nassau and thousands of European drillmasters after him, tapped this primitive reservoir of sociality directly. Drill, dull and repetitious though it may seem, readily welded a miscellaneous collection of men, recruited often from the dregs of civil society, into a coherent community, obedient to orders even in extreme situations when life and limb were in obvious and immediate jeopardy. Hunting bands had depended for their survival on being able to sustain obedience and cooperation in the face of immanent peril. Presumably, therefore, natural selection across unnumbered generations had raised human aptitude for such behavior to a high level; and these aptitudes continued (and continue) to lurk near the surface of our subconscious psyche.

The armies of ancient Greece and Rome had also drawn on this instinctual reservoir to bind their citizen soldiers together. The peculiar intensity of city-state political life depended in no small degree on this phenomenon. So when Maurice of Nassau looked back to the practices of the Roman legions and modified their pattern of drill to fit the hand-weapons of his day, he was grafting his management of armed force upon an ancient and well-tested European tradition.

The new drill therefore drew upon literary tradition to exploit very powerful human susceptibilities. Military units became a specialized sort of community, within which new, standardized face-to-face relationships provided a passable substitute for the customary patterns of traditional social groupings — the very groupings which were everywhere dissolving or were at least called into question by the spread of impersonal market relations. Hence, the artificial community of well-drilled platoons and companies could and did very swiftly replace the customary hierarchies of prowess and status that had given European society its form and its capacity for local self-defense in the days when knighthood had been in flower . . . .

The feats of arms that European armies routinely performed, once drill had become soldiers' daily experience, were in fact quite

extraordinary. Being heirs of the European past, we are likely to take their acts for granted and lose sight of the sense of wonder they properly deserve. . . consider how amazing it was for men to form themselves into opposing ranks a few score yards apart and fire muskets at one another, keeping up while comrades were falling dead or wounded all around. Yet European armies of the eighteenth century did it as a matter of course.

Equally remarkable was the way in which array units obeyed the will of invisible superiors with about equal precision, whether they were located over the nearest hill crest or half a globe away. Many thousands of men who had no obvious personal stake in fighting one another and did have very obvious personal reasons for wishing to be out of the other fellows' line of fire nevertheless did what they were commanded to do — routinely. . . .

The creation of such a new Leviathan—half inadvertantly perhaps -- was certainly one of the major achievements of the seventeenth century, as remarkable in its way as the birth of modern science or any of the other breakthroughs of that age.

[Dr. McNeill's Footnote]: I am not aware of any really perceptive discussion of the psychological and sociological effects of close-order drill on human beings in general or within European armies in particular. My remarks are derived from reflections on personal experience—and surprise at my own response to drill during World War II. (end of footnote).

Did the phenomena that WM traces out as important in modern warfare truly emerge for the first time in our prehuman ancestors? Were there basic plans that ancestors to the prehumans possessed that the prehumans built upon? Do we see traces of this in studies of non-human primates, as with Jane Goodall's chimps who got together in a group to wage war? What about the state induced by the howling signal of canines? To what extent, eventually, will we determine neuronal networks or other cellular arrangements that subserve such basic plans? At what point in vertebrate or prevertebrate

evolution did they first emerge? How? What were the first versions and what functions did such versions subserve? Bone and cartilage elements may have first served sensory functions in prevertebrates [5]; lignin is a structural element in land plants, but may originally have been antimicrobial in early plants [6].

Let me summarize my points about the state that Marc Galanter has observed and learned about in his clinical observations of religious cults, what his reviewer would prefer to call charismatic groups, and what W McNeill associated with large muscles moving in unison. I - in the interests of discussing basic plans - am calling the state experienced by these persons in such groups alpha-reciprocal psalic. That is, I suggest that Silk was correct in suggesting some "lumping" of categories, but I also suggest that the lumping should be even more extensive than his and that reduction to cellular-molecular levels be not less but even more. We should postulate that evolutionarily conserved neural circuits are active when psalics behaviorally characterize the individual. Research questions hinge around how conserved: are basic plans in question in only humans, only primates, only mammals, only vertebrates, only animals? How/when did they emerge from still more basic plans? We need comparative research studies on both molecular and behavioral levels.

(Part 3) Golden age of genetics: Coordinating molecular genetics research with study of behavioral patterns that transcend species, orders, phyla, will drive this kind of work. Certainly genetics research with specific diseases such as bipolar disorder and schizophrenia has been disappointing in that particular kindreds may show a "vulnerability gene" but other kindreds do not. To emphasize the

basic plan approach, this is like trying to understand a genetically based bone disease, eg, osteogenesis imperfecta, without knowing the basic plans of bones, osteocytes, etc. While it may take time for such basic plans to flesh themselves in for psychiatry and allies, we should admit that they exist.

Let me now discuss something of the promise of genetics research as presented by H. Eldon Sutton in another new book recently received by ASCAP, Introduction to Human Genetics [7], which came to ASCAP from Dr Sutton's psychiatrist-wife, Beverly, whose contributions to the manuscript he acknowledges doubly in the preface. Beverly Sutton helped originate a karyotyping laboratory at the Austin State Hospital and has now used it for the past two decades! (Page 6) The Golden Age. To assert that any field is currently in its golden age invites argument. Yet the flow of discoveries suggests that human genetics is indeed in such a period. The confluence of developments in DNA analysis, cytogenetics, cell biology, and the use of computers in the analysis of data has permitted remarkable insights into gene structure and function. It is estimated that there are fifty to one hundred thousand genes in the human genome. ...during the next decade, the characteristic number will likely be established. (There probably is no exact number. Variations in numbers of copies of specific genes are already known). It is likely furthermore that the detailed DNA structure of most, perhaps all human genes will be known. The chromosomal location of all genes will be known, though again there may be some variation from one person to another, A substantial fraction of the inherited variations in DNA structure, both normal and especially abnormal, will have been identified.

How can such information be used? It will be possible to follow the transmission of a particular chromosome segment within a family, recognizing which persons share the segment and which do not. If detrimental genes are in that segment, this will be known also. All dominantly transmitted diseases for which an

embryo is known to be at risk will be detectable prenatally, providing the potential for eliminating all such disease except for those cases arising from new mutations. Heterozygotes for recessive disorders .. can be identified, and all affected embryos from matings of two heterozygotes can be diagnosed, as is already true for sickle cell anemia and thalassemia. The uniqueness of each individual's genotype will make it possible to identify that person from any source of DNA, such as a blood sample or semen sample or from the genetic contribution to an offspring. Cell cultures can be stored frozen indefinitely and tested for particular genetic traits long after the individual is dead. Using supercomputers with large memories, we will be able to store genetic information centrally and retrieve it from any location in the world. ... Let us hope that appropriate safeguards can also be invented to assure that the golden age does not become fool's gold.

HE Sutton discusses basic plans indirectly by alluding to evolutionarily conserved structures. For example, (on p403), "...evolutionary divergence of Ig [immunoglobulin] can be reconstructed by comparison with present-day amino acid sequences. The greater the time since divergence, the more opportunity for differences in amino acid sequences to arise .. all Ig chains seem to have evolved by gene duplication (and reduplication) and amino acid substitution from a primordial molecule of approximately 10,000 daltons. .." The Ig molecule is composed of linked units (domains) of the primordial molecule. Also, these units share sequences with antigens determined by the major histocompatibility complex.

This is a component, then, of a "basic plan" in the immune system: "biological structures that underpin other structures derivative from them, structures in both cases that determine function." Functions of basic plans tend to have been so integral to the adaptation of the organism first evolving them that they didn't atrophy over evolutionary

time. This has meant that they haven't had to be re-evolved. Note that this concept doesn't involve only one basic plan but many, layered over each other. The most basic plan of all, DNA-histone-RNA structures of reproducing cells, are more fundamental than the protein production encoded within; such protein production is more fundamental than the cell membrane and its biology, and so on; going to high system levels, some cell networks are fundamental to others, as we know. Work by G Edelman (who won the Nobel for sequencing Ig) is interesting for basic plan work: he asks how do these primordial genetic structures maintain their integrity, stay unmutated and functional? This represents a hot current scientific issue and perhaps a topic for a future essay.

Why "plan?" Plan implies anticipation of the future, as is true of all living organisms. Living replicating tissue is in the business of assuring the future on a molecular basis. These plans of course are far more basic than thinking conscious planning humans. The vertebrate body plan, color vision of primates, the imprinting that avians exhibit are phenotypes of genetic structures exemplifying basic body plans.

Evolutionary homology, that is when two species possess a trait that their common ancestor also possessed, implies that the trait in question is the result of a common biologic basic plan. Evolutionary convergence, on the other hand, implies that one level of a basic plan responsible for the trait is not shared, although at a deeper level, there must be a basic plan of some sort that can be solved for as a common denominator (eg, both bats and birds exploit the ecosystem of air with differently evolved adaptations of their forelimbs - suggesting evolutionary convergence - but both share in common the more basic plan of forelimbs).



(Part 4) Basic plan research is not always called such: Male Belding ground squirrels invariably disperse from their maternal burrow by a particular age; little females, however, hang around the home site. Female pups treated with androgens dispersed in the male pattern. The discoverers of this [8] concluded that the hormone was the "physiological mechanism" of the behavior and discussed the behavior's ontogenetic processes, effects on fitness, and evolutionary origins. But missing in their formulation are remarks about what it is that the androgens act upon, what neural "basic plan" program exists that allows the androgens to have this effect? The authors could have concluded safely that the basic plan was not one limited to the males, given that females also exhibit the pattern, if provided a right hormone.

Of course, the development of either male and female anatomy is possible from early embryo of both sexes; not much is needed by way of hormonal deviation or administration to switch an individual one way or another, particularly early in fetal life, with major consequences for later behavior.

To switch to basic plans for molecular structures (and to continue our G protein watch), Science recently published [9] on a newly characterized G protein, one specific to the olfactory neuron and one involved in odorant signal transduction. An amino-acid identity with a ubiquitous G protein strikingly involves 88% of the amino acids so common origins seem likely.

So, is the ubiquitous variant ancestral to the newly discovered one? Is it thereby part of a more basic plan? If so, what adaptive pressures or other factors caused it to become more specific? The authors don't address this directly. Indeed, they don't even mention cross-species

comparisons. Only on the article's third paged) do they mention the animal studied (rat) although the abstract referred to "vertebrate."

Of course, perhaps the "new" G protein was the ancestral one; evolution as a tinkerer thought maybe such a good idea shouldn't be wasted on olfaction alone. Or perhaps there was a third protein ancestral to both.

Did you notice the boxed quote on page 1? Its authors [1] investigated the basic plan of a bacterial enzyme in a highly creative way, using molecular biological techniques to make a designer molecule!

The [enzymes in question] ..are too complex for an efficient identification of nonessential sequence by ..[usual techniques]. We therefore used phylogenetic comparisons of secondary structure models to identify potentially dispensable sequences. ... we relied on .. structure models to design a simplified ..lenzyme] that consists only of phylogenetically conserved features.

[ The ] simplified ..[version] was designed, synthesized, and characterized. Although ..[smaller], its specificity .. is identical to that of the native enzymes. ..

The near-native catalytic efficiency of the ..[synthesized molecule] demonstrates that the phylum-specific structures that were excluded from the design are not necessary for the .. lenzymatic action]. This result raises the question of their role or roles in vivo... the variable elements [may] contribute to the global stability of the RNA. .. also possible they [may] relate to unknown, phylogenetically conserved structures. This research is light years away from the extensive work of Marc Galanter (and the observations of William McNeill). But we're moving very quickly and those light years may represent a faster voyage than we know now. The human genome project is gathering steam. Will it eventually lay out the organization of DNA-determined layered basic plans discussed here? We need to assure that behavioral investigations stay current with those on molecules.

1. laugh DS, Green CJ, Pace NR: The design and catalytic properties of a simplified ribonuclease P RNA. Science 1989;244(10 June issue):1569-1571

2. 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. 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.

Some neologisms that hopefully will help implement these goals are those of:

a) Michael R. A. Chance: "hedonic" and "agonic" refer to the tone of groupings of conspecifics (members of a same species) i.e., relaxed and fun-loving versus tense and competitive.

b) J.S. Price: "anathetic" and "catathetic" describe conspecific messages. Catathetic messages "put-down" and anathetic "build-up" the resource holding potential (R) of target individuals.

c) Russell Gardner, Jr.: "psalic" is a 2 way acronym: Propensity States Antedating Language in Communication and Programmed Spacings And Linkages In Conspecifics. This describes communicational states conjecturely seen with psychiatric disorder and normality (human and non-human), ie, alpha psalic seen in manics, high profile leaders and dominant non-human animals. Eight psalics are named alpha (A), alpha-reciprocal (AR), in-group omega (IGO), out-group omega (OGO), spacing (Sp), sexual (S), nurturant (N), and nurturant-recipient (NR).

These new or renewed terms are initiated or elaborated in Chance, MRA (Ed) Social Fabrics of the Mind, Hove and NJ: Lawrence Erlbaum Associates, 1988.

d. Paul Gilbert: Social Attention Holding Power/Potential (SAHP) focuses upon the non-aggressive facets of leadership when this is deployed in the hedonic mode. See ASCAP v.2, #1 and his new book: Human Nature and Suffering, Hove and NJ: Lawrence Erlbaum, 1989.

3. Glantz K, Pearce JK: Exiles from Eden: Psychotherapy From an Evolutionary Perspective. NY: WW Norton, 1989.

4. McNeill WH: The Pursuit of Power: Technology, Armed Force and Society since A.D. 1000. Chicago: U Chicago Press, 1982, pl31 (in Chap 4 entitled "Advances in Europe's Art of War, 1600-1750.")

5. Gans C, Northcutt RG: Neural crest and the origin of vertebrates: a new head. Science 1983;220:268

6. Delwiche CF, Graham LE, Thomson N: Lignin-like compounds and sporopollenin in Coleochaete, an algal model for land plant ancestry. Science 1989;245(28 July):399-401

7. Sutton HE: An Introduction to Human Genetics, 4th Edition Orlando: Harcourt Brace Jovanich, 1988

8. Holecamp K, Sherman PW: Why male ground squirrels disperse. Am Scientist 1989;77(May-June):232-9

9. Jones DT, Reed RR: G(olf): An olfactory neuron specific-G protein involved in odorant signal transduction. Science 1989;244:790-5