

ASCAP

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"[O]ver ... three quarters of a century, there occurred a rise in coronary disease in America that coincided with a loosening of family cohesion and diminished reliance on religion, together with increased emphasis on individual freedom, self-reliance and self-fulfillment."
Stewart Wolf & John Bruhn¹

The ASCAP Newsletter is a function of the ASCAP society,

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.

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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.

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

ADDRESSED TO & FROM ...

MAY MEETING

Planning continues for the meeting on May 21, 1994. As it settles out, we may be mostly a domestic (U.S.) meeting. Paul Gilbert can't raise travel money so we will hear his words at the meeting's onset, read by someone else. John Price now in New Zealand is struggling mightily to come and has applied for study leave, as he and his wife Antonia have decided to spend until late June in the southern hemisphere.

There are decisions to be made: endorsement of the name and mission, method for selection of future officers, approval of reports from the E-mail and Newsletter components by John Pearce and Russell Gardner. Decision-making will be necessary about content-oriented meetings at other times for the participants who are there. Other organizational issues will involve the relationships with the Human Behavior and Evolution Society and the Human Ethology Society, both of which have things in common with the ASCAP Society. Also on the agenda will be future meetings: when, who, how? Ideas about a general recruitment may be raised and discussed, and if approved, methods for doing this.

In addition to such business, I believe (subject to the consent of the assembled group) that 15 minutes should be allowed each person to discuss his or her "preoccupations" of the sort that

generated the attendee's interest in the meeting. As secretary, I will work on keeping notes of these so those who could not come can nevertheless be briefed in future Newsletter issues.

Russell Gardner, Jr.

HUMAN ETHOLOGY

The 12th biennial congress of the International Society for Human Ethology will be held 3-7 August, 1994, at the University of Toronto, Toronto, Ontario, Canada.

Themes will include proximate mechanisms of behavior and cross-cultural research. Founded in 1974, ISHE comprises researchers in numerous disciplines in 30 countries who apply evolutionary theory to the study of human behavior. For more information, please contact: Prof. Irwin Silverman, Psychology Department, York University, 4700 Keele Street, North York, Ontario M3J 1P3, Canada. Tel: 1(416) 736-5122. Fax: 1(416) 736-5814.

Glenn Weisfeld

E-MAIL

ASCAP E-mail is slowly off the ground thanks to John Pearce. He started our E-mail over six months ago (Oct 1993 ASCAP). John sensed correctly some reluctant inertia in me but nevertheless continued a nurturant teacherly role he has had for me for many years (John started as my teacher when he was an intern and I a senior medical student at the University of Chicago several decades ago; it was an outstand-

ing class of interns that also included Jack D. Barchas who is the new editor of the Archives of General Psychiatry and Chairman of Psychiatry at Cornell University Medical School).

With characteristic initiative and energy, not awaiting my lesser states thereof, John even called UTMB Biomedical Communications to arrange for my E-Mail set-up.

John has participated in other networks such as the one from HBES, and was joined in the ASCAP network by Randy Nesse, Kalman Glantz and Linda Mealey. I know that John Price is now connected from Wellington, New Zealand, along with Leon Sloman from Toronto, and that Paul Gilbert expects his professorship at Derby to pay off via an E-mail address in the near future.

Stuck-in-mud me on the other hand seemed to have one technical difficulty after another (in this domain, it was something like the proverbial bad day, except extended). Sometimes more can get done outside the university than within!

Finally, briefly, I got on in February. There were an accumulation of messages that I glanced at and then could not get to promptly because my hard disk crashed! - or so I thought; it was defunct for me and I worked for a number of days with alternate computers; but

then the repairman came and in *his* hands the machine worked again - like going to the doctor only to find the symptoms disappear. At this writing I am still struggling with this new medium but have sent off some messages and hope that they got through. How will it relate to the paper-copy newsletter? This may occupy some future essays, as it has in other journals. Please share your thoughts.

The procedure is as follows if you are at a university or have a modem. John Pearce keeps the list in the World computer in Brookline, MA. Send him your address by any channel -

MAIL: 247 Lake View Avenue,
Cambridge, MA 02138

TEL: (617)492-6355

FAX: (617)492-6355

OR!

E-MAIL ADDRESS:
jkkp@world.std.com

You can send an E-mail message to **ascap@world.std.com** and it will appear in the mail of everyone on the list. There, the recipient can read it, reply to everyone on the list, reply to the individual sender, ignore it, erase it, or save it.

In part the future is surely in these electronics: I will eventually become a more-or-less full participant despite my internal "resistance" (to use a past and still honored psychoanalytic term) and "technical difficulties." When one has new bells and whistles, one

has more things that can go wrong: electrical windows on one's automobile are wonderful until they don't work!

rgardner@utmb.edu

MANICS & CLOSENESS

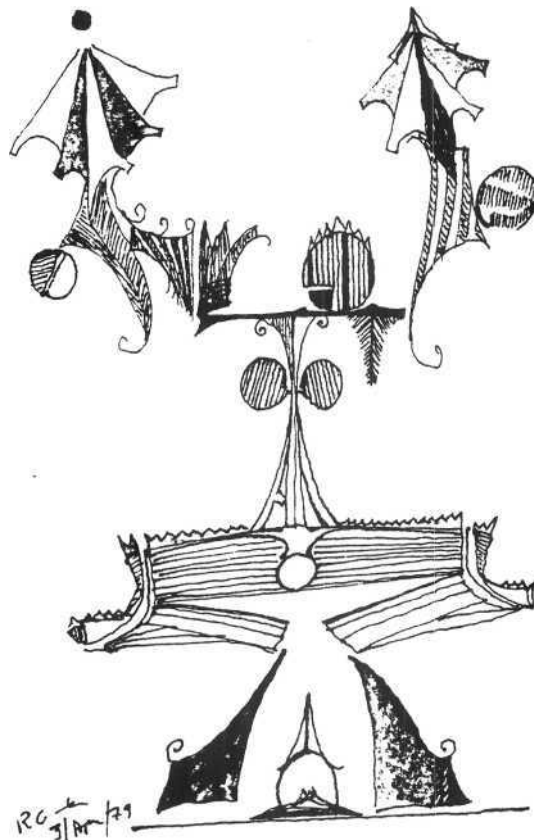
I presently have in therapy a couple of married manic depressives and they each swing both up and down. Last week they were both high together and they had an incredible degree of closeness, each knowing what the other was trying to say and just needing to say the odd word to convey an idea to the other. One would say, "What about Egypt?" and the other would say, "Yes, I'm coming to that." One asked me, "Can't you talk us down?"

Unfortunately I ran out of time, but

they phoned me the next morning and we talked for about an hour, with each grabbing the phone off the other and trying to butt in while the other was talking. They did seem to settle, and later in the day, they phoned back leaving a message to say that the problem was resolved.

I remember thinking that there sometimes can be a lot of closeness in mania. I mean, what about the acute perception of some manics, when they can make astute observations about you? And isn't there a degree of mania in a group of people telling each other jokes and falling about laughing? They kind of reinforce each other and the mania gets higher and higher.

John Birtchnell



ARTICLE: Archetype by any other name?

We have moved forward in the last few years following Russell Gardner's excellent, landmark work on PSALICs in our thinking of basic plans.¹ The literature is now replete with evolutionary concepts such as biosocial goals, strategies, algorithms and so forth. We now strongly suspect that anxiety, depression, paranoia and the like represent states of mind that contain vestiges of earlier evolved defensive options, which have become distorted or amplified in the distressed mind.

I think it is fair to say, however, that Jung's concept of archetype and the idea of a collective unconscious anticipated some of these developments (see also Wenegrat, 1984).² I was re-reading Jung's *The Practice of Psychotherapy*, and although in some ways it is dated (most of it was written in 1928-9), his continual stress that psychopathology is not only related to the personal but to the collective and archetypal dispositions of mind remains valid.³ Let me quote ...

"And in as much as the new born child is presented with a ready made, highly developed brain which owes its differentiation to the accretions of untold centuries of ancestral life, the unconscious psyche must consist of inherited instincts, functions and forms that are peculiar to the ancestral psyche. This collective heritage is by no means made up of inherited ideas, but rather of the possibilities of such ideas - in other words, a priori categories of possible functioning. Such an inheritance could be called instinct, using the word in its original sense. But it is not quite so simple. On the contrary, it is a most intricate web of what I have called archetypal conditions. This implies the probability that man will behave much as his ancestors behaved, right back to Methuselah. Thus, the unconscious is seen as the collective predisposition to extreme conservatism, a guarantee, almost, that

nothing new will ever happen."

Of course, things have moved on and evolutionary biology has given us new and more complex ideas of how to sub-divide the evolutionary. Many therapies have become more cognitive with a stress on meaning and appraisal. Yet Jung has also emphasized the importance of conscious attitudes to the collective archetypal mind; that neurosis could arise from a failure to develop a helpful attitude to it (i.e. beliefs that one should not be assertive; or beliefs that give rise to excessive competitiveness). Indeed, much of his theorising was about this conflict between the archetypal and conscious attitude. He also stressed the value of homework, the importance of taking breaks from therapy to avoid dependency and that people can be educated in the ideas that their minds contain vestiges from the past. These are all as valid today as they were over sixty years ago. I raise this issue because it seems to me that Jung's concept of archetype and the collective unconscious remain useful working hypotheses. There are some Jungian theorists who have recognized that Jung's approach is particularly suited to evolutionary

biology; Anthony Stephens being one of the foremost.⁴⁵

... This collective heritage is by no means made up of inherited ideas, but rather of the possibilities of such ideas...

I raise these points because I had a fascinating debate at a recent conference on the Self where I gave a

paper suggesting that attachment and rank are forms or archetypes that help to structure experience, appraisal and create self-other role relationships. Someone who professed to be a Jungian (I am never quite sure what that means actually) told me that the concept of archetype could not be used biologically like this, but only as a symbol formation device. That took me aback, but also got me thinking. I have always thought that in some way we were working out a new archetypal psychology and said so.⁶ Maybe I'm wrong on this though. So are the concepts of archetype and collective unconscious useful to

us? If so, how should we define them? Have the terms been so claimed by certain groups that their meanings are no longer valid for us? Basic plans and archetype; where do they differ - not in terms of specific forms, e.g. hero versus alpha - but as concepts? Is it not true that we ourselves are suggesting the existence of a collective unconscious, filled with strategies and algorithms evolved over many seasons past, and of which we have only the vaguest personal knowledge or insight? Of course Jung was interested in dreams, alchemy and the Gnostics (although he always passionately denied his theory was about metaphysics). Yet today we remain interested in people's fantasies; e.g. for revenge, love, rescue, power and status, and it is difficult to not see these fantasies, that can be so powerful and literally grab the mind, as products only of a personal-acquired domain (though clearly things in the environment can nurture them and set them off).

I was fascinated by Brant Wenegrat's paper that he gave at the APA in 1990 in New York (which incidentally I have not yet seen in print), where he explored the themes of horror film fantasies and showed that many of them reflected evolutionary themes and are well represented in the distressed mind. Personally, I do not think that such insights can be easily explored without some concept of archetype and collective unconscious mind. Sadly, from my point of view, although research now shows that unconscious processes are easily demonstrated, the theory of the unconscious remains primarily Freudian rather than, as Jung suggested, collective.⁷ Still, these may be misguided thoughts and we would be better to start again.

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by J Price

ARTICLE:

The escalation of Robert Southwell

In reply to Russell Gardner's essay in January's ASCAP (*The saint who didn't submit*), about the saint refusing to submit even under extreme torture, I agree that the large brain can do things undreamed of by monkeys and apes. One such thing is reframing, so that the stimulus loses its inevitable quality and becomes what we make of it. The martyrs reframed torture into "Christ-like experience", so that the more it hurt, the more they identified with the Christ who was tortured on the Cross. Thus the pain could produce not only misery but ecstasy. I don't know if that applied to Robert Southwell; perhaps he used other methods, but certainly he seemed to reduce the catathetic quality of torture. He remained escalating in all three modules or levels: in the deliberative module because he continued to feel superior to his torturer and to emit dominant (catathetic) signals to him; in the emotional module because he remained angry rather than dejected; and in the thymic module because the torture did not trigger an involuntary subordinate strategy (ISS). The reason the torture was ineffective in this way was, I think, because it

failed to reduce his RHP. Perhaps this was due to some reframing, perhaps because he gave as good as he got, and remained "bloody but unbowed".

We have realised and said (somewhere) that a catathetic signal only reduces RHP if it is not returned in full measure. To use the Sloman tennis analogy, a good serve only makes you feel bad if you don't return it. In Southwell's (case, although he could not reciprocate the physical pain inflicted on him, he could retaliate with words and clearly got the better of the verbal exchange, putting the torturer down with his condescending manner. This is one reason to subsume physical and verbal catathetic signals under the one heading (see "More about catathetic signals" in January 1988 issue of ASCAP).

A similar case was that of Yeo-Thomas being tortured by the Gestapo, described by Bruce Marshall in *The White Rabbit*, and another was Alec Guinness playing the part of a Hungarian Cardinal being interrogated by the KGB, and also Alec Guinness being tortured by the Japanese in *The Bridge on the*

River Kwai, and achieving moral supremacy over the Japanese colonel. These are all examples of the triumph of the spirit over the flesh. It is daunting to imagine oneself put to such a challenge. The principle is that we have to return a catathetic signal to avoid being "put down" by it. The actual coinage doesn't matter, words can stand for blows and vice versa; the martyrs exchanged words for blows, the battering husband exchanges blows for words.

The question of how to prevent catathetic signals from lowering RHP is an important one clinically. People are very good at discounting anathetic signals (praise) but not at discounting catathetic signals. Apart from returning the catathetic signals of torture in the form of words (as Southwell did) the martyrs used at least two separate reframing techniques:

1. The torture is something demeaning to the torturer, and therefore lowers the torturer's RHP rather than that of the victim. This technique is clearly more effective if the reframing can be "sold" to the torturer; e.g. "the more you hurt me, the more pathetic you are". In a more domestic scene, catathetic signals can be reframed as "bad temper", "loss of control" or "ungentlemanly behaviour". The blows which the drunken husband uses at night to put his wife down may well be used by the wife next morning to put down her now sober and remorseful husband. The Chinese have a saying that the man who escalates from words to blows shows that he has lost the verbal argument and thereby loses face.

2. The torture is something similar to what Christ suffered and therefore makes the tortured person Christlike; and the gain in RHP from being Christlike overwhelms any loss of RHP from the pain. Or in extreme cases the pain was actually experienced as ecstasy.

Even during his lifetime, Christ reframed torture for his disciples. He pointed out that the prophets were persecuted and so to be persecuted put them into the company of the prophets. And he altered the "payoffs" by promising that earthly punishment would be more than counterbalanced by heavenly reward. Jay Haley points out that this kind of reframing was one of a number of strategies used by Christ to

enable the meek to turn the tables on the arrogant.¹ Jesus said:

"Blessed are ye, when men shall revile you, and persecute you, and shall say all manner of evil against falsely, for my sake. Rejoice, and be exceeding glad: for great is your reward in heaven; for so persecuted they the prophets which were before you."(Matt. 5: 11,12).

The lowering of RHP from the persecution is outweighed by the increase in RHP from the reward in heaven, and by this alteration of payoffs Jesus is able to change a putting down signal into a boosting signal. After 300 million years in which a catathetic signal was remorselessly catathetic, by this reframing it could become anathetic. Surely the conversion of anathesis into catathesis was more of a miracle even than the conversion of water into wine?

At the risk of losing political correctness, one should also mention that abuse can be reframed as love or attention: When I was a casualty houseman at Bart's it was well known in the Italian community who lived up the Metropolitan Road that the women were proud of the bruises they bore from their husbands' beatings, because in that culture to be beaten up signalled more interpersonal caring than not to be beaten up.

If there is an audience to the episode of torture or brutality, then there is much greater scope for reframing, because the torture and victim are then not competing directly with each other but are vying for respect and prestige from the audience (engaging in polyadic rather than dyadic competition, or in competition for status rather than competition for power). This was the case with Gandhi's attempt to enter the salt factory, portrayed in the eponymous film, in which the loss of RHP in his supporters by being clubbed was more than balanced by the respect given to them by the world-wide audience. In such a case the criterion by which the behaviour is judged is out of the control of the rivals. The verdict may go to the strong; on the the other hand, it may go to the weak because of their courage and sportsmanlike behaviour.

Another technique is to invalidate the catathetic signals by denying their significance as signals. This is often used by husbands against wives, when the husband attributes the wife's attacks on him as due to "her time of the month" or some such biological cause, thus denying the signal value of her behaviour. Or the husband can invalidate the catathetic nature of the signal by reinterpreting it as a sexual signal, saying to his wife something like: "It really turns me on when you get angry."

Then there is the professional way of dealing with abuse from patients. When I ran a support group for Domiciliary Nurses, one of the recurrent problems was the patient's statement that "You are no good" or "You are not as good as the previous nurse." It helped here to reframe the abuse as transference, and to emphasise the concept of the "professional ego" which is to some extent separate from the personal ego, so that attacks from patients are felt less personally. Of course, these techniques are used by psychiatrists too.

The impact of an insult (or blow) varies with the prestige of the insulter and the truth of the insult; so that the impact can be lessened if the insulter can be despised and the truth of the insult denied. Also, as Vernon Cronin has pointed out, the context defines the meaning of what is said (as well as the meaning of the statements defining the context, as agonistic, teasing, constructive rather than destructive criticism, etc.); so that hurtful remarks could be redefined as teasing, and destructive criticism redefined as constructive criticism, but the tendency in most situations is for the reverse to happen, and for neutral or helpful comments to be redefined as putting-down.

On the whole, there is very limited scope for reducing the catathetic effect of insults and blows in the case of the ordinary person and even the well-trained professional. Hurtful things hurt, whatever you do about them. Hence, no doubt, the recourse of some people, such as the saints and martyrs, to radical reframing techniques which are beyond the capacities of the rest of us.

One should also mention training for the receipt of catathetic signals - sports like boxing for the receipt

of blows, family teasing for the receipt of insults, and the courses run for those who have to receive complaints from the public - from the customer "who is always right" -- and which reduce the need for such people to redefine the public *en masse* as a despised category of people such as "goons".

In all this talk of catathetic signals, we are dealing with a very basic social plan for the management of the distribution of RHP within groups of humans - a process which was conducted by putting down in early evolutionary times, and later also by boosting up with praise and the allocation of prestige - and the way the "big brain" can get round the basic plan when it impinges too painfully on us.

The Importance of Hedonic Symmetrical Relationships

Since I have been accused of neglecting and undervaluing the "horizontal dimension" of closeness/ distance in relationships, I would like to share with you what I think must be one of the most generous and friendly notes ever written. It was written by Turgenev to Tolstoy, who had always treated Turgenev badly in the past:

"Kind and dear Lev Nikoleyevich. It is a long time since I wrote to you, for I have been and am, frankly speaking, on my deathbed. I cannot recover -- there is no use thinking of it. I am writing to you particularly to tell you how glad I am to have been your contemporary, and to express to you my last, sincere request. My friend, return to literary activity! That gift came to you whence comes all the rest. Ah, how happy I should be if I could think that my request would have an effect on you! I am a doomed man - even the doctors do not know what to call my malady, Nevralgie stomacale goutteuse. I can neither walk, nor eat, nor sleep. It is even wearisome to repeat all this! My friend, great writer of the Russian land, heed my request! Let me know if you receive this bit of paper and permit me once more to embrace you heartily, heartily, and your wife and all yours. I can write no more. I am weary."

This note expresses a request for closeness, and also the sort of anathesis that is offered between equals. It is a request for a hedonic symmetrical relationship (even if a short one). Apparently Tolstoy

did not answer the note, and two months later Turgenev was dead.

An example of Tolstoy's ambivalence about hedonic symmetrical relationships was Dostoevsky:

"I never saw the man, and never had any direct relations with him and suddenly when he died I realised that he was the very closest, dearest and most necessary man for me. I was a writer, and all writers are vain and envious - I at least was that sort of writer. But it never occurred to me to measure myself against him, never...."

I have just finished A. N. Wilson's life of Tolstoy (from which the above quotations are taken), which is not only excellent reading but gives a good insight into Tolstoy's total inability to develop hedonic symmetrical relationships with anyone. He and his

wife fought like cat and dog - she could never accept his radical views or his philanthropy, like using his royalties to send the Dukjobors to Canada. And he was hostile to his fellow writers, such as Turgenev. He only enjoyed the company of his serfs who loved him because he was an aristocrat, or his coterie of those who admired his genius. In his relations with superiors he cloaked bossiness with subservience. He wrote to the Czar, offering to be his devoted slave, provided the Czar pardoned the assassins of his father and sent them to the USA! In many ways he fits the category of authoritarian personality, which is rather paradoxical for such an advocate of civil rights and Christian love - he lived by Potter's pernicious principle that "He is who is not one up is one down".

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by C Reichelt

ARTICLE: A review of Birtchnell's book on relating

When John Birtchnell's spatial model of relating first appeared in [The ASCAP Newsletter](#). I was somewhat dubious. I suffer from a bias against trying to jam the complexity of the human spirit into little compartments. But in this case, further essays had increasingly piqued my interest, so that when called and asked if I would like to review the book, I agreed.¹ It seemed worthwhile to see if a full exposition of the theory would be persuasive enough to quell my remaining doubts. I'm glad I did, because I'd have missed an enjoyable and stimulating read if I'd refused. I recommend this book to anyone interested in human feelings and interactions; not just professionals, but any intelligent reader. From Russell Gardner's excellent foreword to the concluding chapter, the book is easy, relaxed, engaging and informative! I found myself eager to get on with it, my work an irritant that took me from the more pleasurable activity.

Dr Birtchnell has defined relating clearly and completely. The word "relating" is itself a fine choice -

instantly descriptive to any reader. It also includes a broad-ranging literature review and history of the evolution of the interpersonal movement that helps to strengthen the argument that a redesign of interpersonal theory is needed. Freedman's original circle has been modified by many thinkers and has seemed to grow more cluttered and complicated with each effort, which is one problem with classifying the infinitely variable behavior of humans.² Where does one stop? What should be considered a basic element of relating? What are the definitions? If a theorist wants a schematic that covers the subject, shouldn't it be a schematic? Too often, in the effort to cover all bases, the whole purpose of the outline gets lost. Here, the simplicity of a true schematic is employed, so that by using dimensions rather than qualities, the schematic is available and applicable to a wider array of purposes. That is a substantial strength of Dr Birtchnell's approach. Also this tack avoids another serious weakness (in my bias) of the other approaches: their human-centeredness. Happily, Dr Birtchnell makes clear, by using many

examples of relating in other species, that relating is not just a human activity. So evolutionary theory is recognized, even though he doesn't go extensively into it (in fairness, that is the topic for another book -- or books). He perceives relating to conspecifics as something animals do over a broad range of behaviors and feelings. For example, we people may relate to individuals in our internal world and to ourselves.

***... We may relate vicariously
or in a self-centered or
other-centered manner ...***

We may relate vicariously or in a self-centered or other-centered manner. We may develop a facility for relating positively or we may have temperaments and experiences that cause us to avoid relationships: negative relating. He writes a wonderful, brief discussion of the role of parenting as it helps children to learn to relate to others and how this leads to well or poorly adjusted adults.

As [The ASCAP Newsletter](#) readers are aware, relating is visualized as occurring along and about two axes. The horizontal proximity axis represents degrees of closeness/distance and the vertical power axis represents upperness/lowerness. Any position on any of the poles may be good or bad depending on the situation. One's position on an axis is not static, but may shift depending upon the other to whom we related. The vertical axis may describe power, bigness, king on the throne, animals raising coats in agonic encounters, or the lower end, the submissive wolf groveling with exposed throat, the depressed patient curled in a fetal ball on her bed. Being submissive may be good, if the submitter wants to be taken care of like the CEO when in a hospital for a bypass. Being powerful may be bad if we want to be taken care of but can't be; for example, the woman suddenly forced by divorce to be doubly parent to her children. The computer hacker may be perfectly happy to be distant from other people; the husband whose wife demands constant attention may be miserable in stifling closeness. In this context, the book makes the important point that relating isn't the defense against stress that some early psychoanalytic theorists considered it, but rather that it is a positive and normal activity aimed at gaining some-

thing. This, of course, places it squarely within evolutionary theory. In this view, relating becomes both proximately and ultimately advantageous to the animal.

The book reviews how one human becomes close to another, how and why the choice is made. We are led to consider kinds of closeness, including that within the psychotherapeutic relationship, and the quality of closeness. Closeness as it relates to the vertical axis, negative closeness, the pleasures and pains of distance; all come under Dr Birtchnell's scrutiny. Analyses of the individuation of children, creativity, even sleep, isolation, deprivation, lack of trust, and psychiatric conditions including suicide were particularly interesting. No aspect of the horizontal axis that I can think of has been omitted.

I was particularly struck by what a challenging task it will be for human behavior researchers to determine how much of the human position(s) on this axis (and the other for that matter) is influenced by genetics. Is the avoidant, negatively distant personality that way because of distant parents or because distance is influenced by his/her genetic makeup, which might account for the parents' distance too? Was that individual a cuddly baby or a push-away, stand-on-his-own-two-feet type?

The book constantly sparks ideas in the reader. For example, I was also much taken with what he said about xenophobia. One wonders if the territory might be a precursor of human xenophobia. The chapters on the vertical axis were just as well organized and thoughtful as those on closeness/ distance. The qualities of upperness/lowerness, the routes to these positions, the functions and responsibilities are all here. One special delight lay in the deliciously witty definition of money as "packaged upperness"!

As with the horizontal dimension, Dr Birtchnell relates the vertical axis to normal or positive behavior and then to psychiatric manifestations of negative upperness or lowerness: antisocial, narcissistic, manic, violent, sadistic, depressive, hopeless, masochistic behaviors. But he does an especially good job of making understandable the concept of lowerness as positive. That's an idea perhaps not particularly welcome in our egalitarian, achievement

oriented society, where everyone must have a college education - whether they want or will use it or not - but it's a good one. I also liked his inclusion of religious feeling in the discussion, an important dimension of many people's lives, and one not always adequately recognized.

I raise an objection to Dr Birtchnell's assertion that animals in the wild never beg. They most certainly do, and it is an indication of lowerness when they do, just as in humans. Baby birds, infant wild canids, and others beg for food, either fresh or regurgitated. Young and submissive adult chimpanzees beg by reaching out a suppliant hand with a repetitive grasping motion. Begging is thus a positive lower infantile trait; positive in an adaptive sense, that is. And the only way that domesticated and captive animals could learn to beg is because that particular adaptive mechanism is in place when their captivity forces them to revert to infantile dependency.

After his exhaustive discussion of all aspects of the the two main axes, Dr Birtchnell divides the spaces between axes into eight segments. These intermediate positions permit a flexible and descriptive schema. People are an amalgam of feelings and behaviors that change chameleon-like from interaction to interaction. General predictions about an individual can be made: "He's upper with everyone but his granddaughter, who can lead him around by his little finger all day long." This permits a graphic representation of both his upperness and his humility in the face of the little girl's innocent dominance. But it is simple enough to avoid the excessive detail of some earlier attempts.³ People can change position drastically; depression or mania are examples. Illustrating these changes can be highly useful, as Or Birtchnell demonstrates with some newly developed instruments designed to measure therapeutic effects. Undoubtedly, this is just the beginning of the theory's value. Along those lines, I do believe that Russell Gardner's LUCD scale stemming from

Birtchnell's axes should be further developed.⁴ I think that it could help precise quantification in practical applications of this version of interpersonal theory.

One concern: the interpersonal theorists tend to blur the distinctions between normal and abnormal, so that the illness concept inherent in much present day psychiatric thinking is lost. I think that's a mistake, especially with the psychoses and some affective disorders. Such mental states are increasingly amenable to treatment by drugs which change the biochemical status of the brain. These biochemicaais are part of the genetic heritage of the individual, just as is insulin or thyroxin. When either of the latter are changed in their available amounts or the body's ability to utilize them, we experience illness. The same is true of brain chemicals. All of these have been evolved for adaptive purposes and are very basic. This is precisely why neurochemicals support an alpha wolf's upperness or an omega's willingness to forego breeding in order to help rear the alpha's

young. But a shift in the amount or availability of these chemicals so that an alpha suddenly feels like an omega (whether wolf or human) creates an illness as surely as

... People are an amalgam of feelings and behaviors that change chameleon-like from interaction to interaction...

does a shift in insulin uptake. The mechanism of depression probably permits survival as John Price suggests and therefore is an adaptive trait, but it is often an aberration from the human animal's norm nevertheless.⁵ This is precisely why Russell Gardner's term "sociophysiology" for a basic science of psychiatry is such a good one. Ours is a social (interpersonal) science but appropriate social functioning is dependent on good physiological functioning.

Despite a quibble or two, I believe that this book is an advance over past attempts at categorizing human relating. Dr Birtchnell covers the subject thoroughly and suggests worthwhile applications. His effort is clear cut, believable, exhaustive and flexible enough to permit those who follow to embellish as needed.

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ARTICLE: **A response to Michael Chance**

I was delighted to find myself bracketed with Michael Chance in a plea for us to be less concerned with psychopathology. Most human behavior is not psychopathological and, since evolution involves all human behavior we would be better not restricting our attention only to the psychopathological. My book (see previous article) intentionally was not primarily directed at the psychopathological (though there is a lot about psychopathology in it) as I felt that our first priority is to establish the basic rules of relating.¹ These rules can then be applied to specific areas of human activity, including psychopathology. The major problems of our time are not in the area of psychopathology, though some psychiatrists would have us believe that they are.

It disturbs me greatly when I read of the vast resources which are being directed towards seeking a better understanding of our planet and the universe. It is not physical matter which we need to understand, it is ourselves, and one aspect of ourselves that we need to understand is why we are more preoccupied with studying physical matter than we are with studying ourselves. This, I would contend, is a manifestation of distance. Distant people are more interested in things than in people. I would like to propose that one of the manifestations of civilization is a movement towards distance. Primitive people appear to have a greater tendency towards closeness, which involves an interest in people, than civilized people do. In fact, primitive people relate to things as though they were people (animism). As civilization advances there is a greater and greater interest in and proliferation of things. Tools evolve into machines of greater and greater complexity and humans become more and more preoccupied with them. Civilization and science go hand in hand. Suttie wrote that science represents a flight from tenderness (closeness) into a peculiarly sublimated form of intellectual play.² He considered it to be the antithesis of Christian religion which seeks to reconstitute the tender relationship with the human environment which, he claimed, is lost in early childhood. Religion is one feature of primitive thinking which we have managed to hold on to.

I was further delighted to read of Michael's plea that we should be concerning ourselves with the over exploitation and ruthless spoilation of the environment by capitalist expansionism. Berman was disturbed by the processes of modernization, such as industrialization, urban growth, mass communication and an ever expanding, drastically fluctuating world market.³ Frosh maintained that modernity is characterized by the denial of relationships with others and an inclination towards narcissism, by which he means an absence of interest in and empathy for others and a retreat from reality into a phantasy world (his spelling).⁴ One of the manifestations of modernity is a preoccupation with making money. It is worrying that there are entire professions directed towards using money to make more money. Shifting attention away from people on to the thing, money must be another manifestation of distancing. Money has been described as the root of all evil. Christ viewed it with suspicion and would have little to do with it. He threw the money lenders out of the temple and warned of the impossibility of a rich man entering the kingdom of Heaven. What would He make of the stock market?

In my book I propose that humans have attained the greatest degree of closeness, and I would still stand by this. Whilst I have said earlier that primitive people have a greater tendency to closeness than civilized people, I would have to concede that, within civilization, the human proclivity for ever increasing levels of closeness appears to have continued to develop, and some civilized humans are probably capable of far greater degrees of closeness (in terms, for example, of self-disclosure) than primitive people are. This would partly be due to the refinement of language, which is both a manifestation of our need for closeness and a factor which has increased our capacity for closeness. Yet, strangely, in parallel with this increasing proclivity for closeness, there has been an increasing move in the direction of distance. The one may be a reaction to the other. In areas of high population density, people strengthen their personal boundaries and defend themselves against intrusion. On the underground (subway), for example,

where total strangers are crowded together, strategies develop for avoiding personal contact.

Michael writes of the contrast between communism and capitalism and this, to some extent, is the contrast between the politics of closeness and the politics of distance. One reason why communism has failed is that communist countries have been unable to compete with the lean and mean economic policies of capitalist countries. Communism stands for employment for all, a more even distribution of wealth, and safeguards against the exploitation of the workforce by the management. Employment for all leads to overmanning and low productivity, a more even distribution of wealth reduces the incentive to make money, and kerbs against exploitation result in workers working shorter hours for more money, which again reduces productivity. I would maintain that the politics of the left are more to do with human welfare, even if it means loss of productivity, loss of economic growth and loss of wealth. The left is more concerned with understanding why criminals offend and helping them not to reoffend, and the right is more concerned with imposing harsher punishments. The only party which is opposed to the kind of exploitation to which Michael refers is the Green party and perhaps it is the least distant party. I sometimes think it is the only hope for mankind.

Many of the ills which Michael describes are the manifestations of excessive distance. If we distance ourselves from those who are dying of starvation we are able to tolerate their doing so. We need to distance ourselves from people before we can exploit, torture, terrorise and exterminate them. In distance, we not only prefer things to people, we also treat people as though they were things. In closeness, we identify with people, sympathise with them and empathise with them. This is Buber's distinction between the I-It and the I-Thou position.

In my writing, I am always at pains to point out that distance is just as necessary to our wellbeing as closeness, and is neither better nor worse than closeness. Civilization needs people to be both close and distant. Closeness tends to come more to the fore in small groups, where everybody knows each other, which is why it appears to predominate in primitive culture and within families. But even in

small groups and families distance is necessary. One reason why flower power ailed is that the need for distance was ignored. It is not true that "all you need is love". You cannot get close to everybody and you cannot stay close to any one person all of the time. A parent cannot remain lovey dovey towards a child all of the time. Sometimes s/he need to enforce limits and impose restrictions.

Civilization is by far the most complex social structure there ever was. We only imperfectly understand it and we need to direct far greater resources towards understanding it more completely. It is not that communism is all good and capitalism is all bad, or an interest in people is good and an interest in things is bad; we need some of each. We need equal amounts of closeness and distance. Within civilization there appears to have been an excessive swing in the distance and we need to be trying to understand how this has come about. Is excessive distance an inevitable consequence of civilization, or can we devise ways of introducing more closeness into relations between people and relations between nations? Ironically, the collapse of communism has resulted in a greater degree of closeness between the east and the west, but that has been at the expense of the east becoming capitalist. I have to concede that, in nations which have turned to communism, e.g. the USSR, China and the emergent African nations, there has been immense cruelty (distance).

For all its shortcomings (e.g. an excessive preoccupation with obedience, sin and guilt), Christianity, in common with many other religions, places great emphasis upon closeness and the consideration of the feelings and needs of others, but there has been immense cruelty perpetrated in the cause of Christianity. I do not think we would stem the tide of capitalism by reinstating Christianity, but I agree with Suttie, that modern societies have moved away from sentimentality and I think that we need to find ways of swinging back towards it. Perhaps we need to be de-civilizing ourselves or perhaps we can find a way of being civilized whilst remaining humane. I certainly agree with Michael that this is an area with which ASCAP should concern itself.

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ARTICLE: Iron will versus whim of iron: the vertical axis displaces fun

A Sunday newspaper cartoon about an elderly curmudgeon had his relatives viewing a dismantled sink at a busy time. The grumpy old man had seen the faucet drip and decided right then to fix it despite the timing. *Of course*, the family felt, he also had to go to the store for a missing part while the equipment remained dismantled and unusable. His son's wry punchline labeled the old man's "whim of iron."

During vacation trips, my wife Suzie takes great pleasure in their planning features. For me, more than not, "capturing the moment(s)" are the very pleasant components of the trip. We generally get along well in this: within limits, she enjoys the stimulation of my impulse and I appreciate the planning effort. Moreover, she is careful about negotiating her planning: she mentions a possibility, solidifies my agreement, and shapes subsequent activity to conform with it. But sometimes things go awry: recently while on a trip, things dismantled when her will of iron encountered my iron whim.

The trip illustrated the usefulness of John Birtchnell's (JB's) division of relating into vertical and horizontal axes and John Price's suggestion that the vertical was ancestral to the horizontal. As you recall, vertical represents power politics with participant appetites for upperness and lowerness. The horizontal axis refers to desiring closeness or distance; being intimate and having fun are examples of closeness; sequestering oneself to do some reading and writing are more distancing. Chance's tense authoritarian agonistic mode versus a relaxed, fun-loving hedonic tone of how groups interact correspond roughly and imprecisely to the two dimensions (they describe different things really; a group tone is not the same as an "appetite" for relating).

Another concept of communicational propensity states (CPSs) involves a notion that is not so much competitive with these others as descriptive of the same phenomena from a different perspective. That is, I believe we need in addition to the others a depiction of defineable and specific behavioral states with some potentially measured neuronal correlates that are nevertheless expressive of the Birtchnellian

appetites for relating and causative of the Chancian group atmospheres. The CPS-concept is engineered for top-down and bottom-up investigations. There are many more CPSs than dimensions of relating and descriptions (psalics) of group tone, divided amongst those shared with other animals and those that have seemed to me human-specific. More of this below and in other essays. Back to the Texas vacation trip.

Such trips for both Suzie and myself entail pleasant doings and this was certainly the case during a springtime automobile visit to the Rio Grande Valley: new things to see, a part of the state long known about but not before directly experienced, proximity to Mexico, spring flowers out in abundance. While in Brownsville (the southern-most city in continental U.S.), Suzie suggested a tour of the famous King Ranch (KR) while on the return to Galveston. I concurred in this over breakfast and there seemed little conflict with a less well articulated plan for me that we also encounter the southern-most tip of Texas, something well in reach given where we were, and something for which, it seemed to me, we had time.

The CPS of ally-fellowship-friendliness continued to prevail as we encountered a street named "Southmost" and we took it in its southerly direction; moreover, we even found the Sabal Palm Grove Sanctuary which dipped even further to the Mexican boundary; we enjoyed its walking tour and during it found the Rio Grande. On a continued southern walk, however, Suzie wondered aloud where we were going; she pointed out that more minutes there meant risking being too late for the KR. We were in conflict that escalated since not proceeding further meant that my whim of seeing the southern-most point would be thwarted. Since I was deeply into another ASCAP essay that involved CPSs (in preparation for HBES for a future issue), I was self-and-us-observing even as events unfolded.

First, in JB's language, we moved from horizontal axis to vertical axis: whose idea was going to prevail? I wanted my way and she wanted hers. With CPS language, we found both our alpha and subordination motives increased: we alternated between

wanting to win on that dusty road and both also impatiently and exaggeratedly emphasized our willingness to be resentfully defeated, to angrily capitulate on the respective will/whim. Upperness and lowerness *both* prevailed over closeness and fun: alpha and subordination were locked in; at this point, audienceship (another CPS with more human-specific components) and ally-fellowship-friendliness were no longer in ascendancy.

We also were irritable as neither was winning without cost. Only a Pyrrhic victory was in sight. Pyrrhus was a young Greek king who in 280 B.C. wished to imitate Alexander the Great. He brought the technical advance of elephants to Italy and won two great battles. But his losses were so great -- another such would ruin him. In fact, he did later lose and in so doing lost to the Romans for the last time the Greek toehold (heelhold in fact) on the Italian Peninsula.¹

Back from south Italy to south Texas: I was petulantly willing to abandon further walking along the road. Suzie wondered aloud if she should abandon the idea of the KR and hotly expressed that was the better plan. For me, the plan continued to be a good one and one that I had agreed with all along, but I thought there was plenty of time to get there. We learned that we differed on facts: I thought that the last tour there *began* at 3 p.m.; she had assumed that we should be there because the last tour would have ended by then. We had contentious opinions about it in exaggerated and opposite directions.

Suzie offered a compromise: we would walk 15 more minutes and if no bend of the road yet, we would turn back, a compromise that I accepted so quickly that I retrospectively assumed she interpreted it as defeat. She thereupon made another point about our lateness, whereupon I physically wheeled about and walked the other way ("we'll have it your way then!") almost as though I was going to triumph with *my* proclamation of defeat and also now using physical communication rather than verbal means only.

The more agonic tone of our two-person group prevailed for many hours though both of us wished it to go away. One does not seem to *will* the more hedonic tone, just as it won't be legislated, I suppose, as JB pointed out for the Communists and their failed experiment of an ideal closeness in politics in his essay this issue. We couldn't "give way" as Leon

Sloman would have us do - locked into vertical axis modes of relating. Not that we didn't try: we "worked on" trying to evoke other more horizontal CPSs of ally-fellowship-friendliness, restraint and hesitation, attempted displays of (positive) emotions/feelings, negotiations and bargaining, performance reconsiderations and thought-checking, shared reminiscences, and verbal story-telling amongst others.

During the subsequent drive, I remembered the experiments of Suzanne Haber and Patricia Barchas who administered amphetamines to one monkey at a time in gradually increasing daily doses over several weeks while observing the effects upon directly observed behavior in two four and five monkey groups (separated by more than a year).² One monkey, a female, was in both groups. Haber and Barchas (H&B) found that if an animal was already alpha in its status, it stayed that way with more threat and dominance postures than before; if previously subordinate, it demonstrated more submissive behaviors. The result was not due to the reactivity of the other monkeys to the affected animal. The monkey who was in both groups showed dramatically opposite behaviors. In the first group setting, she was an omega-positioned and miserably isolated animal who picked at her fur, and when taking the amphetamine displayed many more submissive behaviors. In the later group, however, as the favorite of the alpha male, she herself had high status. At this time, she exhibited more dominance behaviors when on the drug. Amphetamine augments the norepinephrine system, heightening the vertical axis. H&B found, therefore, that JB's vertical axis selectively prevailed in the medicated monkey of the moment (they didn't know JB's nomenclature ten years ago, of course, but the experiment nicely illustrated the value of his later separating the axes). Amphetamine affects the norepinephrine-mediated and well-known flight-flight system (for prey-predator relations). We now have reasons also to call it the fight-submit system in the case of conspecifics.

So it seemed to be for Suzie and me: our fight-submit system was augmented, and if someone had been measuring our communicative behaviors ethologically, they would, I'm sure, have seen more evidence of both upperness and lowerness communications than would have been the case the day before when the hedonic mode was in evidence. The hedonic atmosphere fully recurred the day after: a

night's sleep repaired the mood completely. With it (and the passage of time perhaps), we both seemed to have more resources to enhance the horizontal axis. The vertical axis stayed away.

Let us also recall Price's formulation that the vertical axis is ancestral -- a more basic plan - than is the horizontal axis. He conjectures that only much later over evolutionary time did Natural Selection, the tinkerer, come up with adaptive modifications of the basic plans. But as we all know, the vertical axis hardly went away, but is rather quite easily evoked in many people, and once evoked doesn't quickly and easily go away. Trait versus state issues arise; our day of verticality was only one a five day vacation, but in JP's description of Tolstoy, verticality was lifelong, part of his personality. Even to the Csar, he was challenging, alpha in his haughty demands.

Noting the possible restorative of sleep that potentially outweighs time passing, I'm reminded of Winson's thesis of REM sleep carrying out in most mammals a processing of the previous day's events. He noted that a very primitive mammalian, the anteater or echidna, has no REM sleep on the one hand, but a proportionately larger frontal lobe on the other hand. He conjectured the echidna had to do it's information-processing on-line with frontal cortex what we do multiply tracked with REM. He never explained, however, about why the pacing center of REM sleep is in the pons, part of the metencephalon, a part of the brain that is just two divisions up from the spinal cord, that is if the cortex (telencephalon) is part one, the pacing center is in part four (of five).

My new speculation (new to my knowledge) is that it is not accidental that the timing center for REM sleep is in the pons, because that is near the locus coeruleus, which is the pigmented center of origin for norepinephrine neurons that course from it up and down the neuraxis. I conjecture that what we have to do in nighttime is to calm our vertical axis and that that is what REM sleep is about. Not that overrides don't occur; more than usually activated REM sleep results in bad dreams and interrupted sleep which are characteristic of post-traumatic stress disorder.

We are perhaps misled by the triune brain of MacLean here. As you recall, the basal ganglia and parts below it were the "reptilian" brain. On top of this, Broca named the limbic lobe that he noted was

not the rhinencephalon (smell-brain) because dolphins without an olfactory nerve had it too. MacLean revived the limbic system term after the better part of a century of neglect, and speculated that it represented the advances present in paleo-mammals and that neocortex with its modern six layers was the triumph of the neomammals. Critics since then, however, point out that not only did the neocortex and limbic systems increase in size, but that the basal ganglia and other "lower" structures did too. They note the brain is interconnected all the way up and down and that "remodeling" of all neuraxis parts must have taken place in concert with the added neurons with expanded functions. I propose that such a remodeling took place at the very low level of the pons with the advent of mammalian nursing: mothers had to relax their Birtchnellian vertical axis to relate comfortably with their offspring.

Returning to the battle day: much got done on the actual day that southmost Texas aligned itself against the KR: Suzie and I agreed that activation of JB's vertical axis was not a good thing for us when on vacation; the hedonic mode of Chance was greatly to be desired instead. In fact, we considered that one of us yelling out "Southmost compromise!" might be a way of reducing future escalations. Moreover, the KR tour was a wonderful experience, and we both felt more relaxed. Part of it was separation (the distance end of JB's horizontal axis): Suzie watched a videotape while I perused the spread-out books. It also helped that she didn't object when I invested in some, even an expensive art book.

But after this interlude and on the road again, we discovered that our threshold to anger and contention was still lower than usual (we indeed seemed to need that night's sleep). We discovered this after Suzie made a plan for an AAA-recommended restaurant at which we would eat Texas barbecue, but I (on a whim) desired a less prestigious barbecue joint that I saw upon the road (I guess I was hungry and the principle of "barbecue = barbecue = barbecue" held in my mind). I gave in, however, on both occasions. But if the whim of iron succumbed to the iron will, the essay material that emerged has been fun to write, and, moreover, Suzie upon reading it has agreed with the facts of it, and she likes the art book.

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ABSTRACTS & EXTRACTS...

Wilson D: Evolutionary Epidemiology: Darwinian theory in the service of medicine and psychiatry.

Wilson DR: Ideas in theoretical biology: Autologous clones.

Kappen C & Ruddle FH: Evolution of a regulatory gene family: *HOM/HOX* genes.

Gilland E & Baker R: Conservation of neuroepithelial and mesodermal segments in the embryonic vertebrate head.

Abstract & Extracted Quotes from ASCAP's 2nd Vice President, Daniel Wilson...

Wilson D: Evolutionary Epidemiology: Darwinian theory in the service of medicine and psychiatry
Acta Biotheoretica 1993;41:205-218

Abstract: Efforts to comprehend both normative and psychopathological behavior will benefit greatly from a thorough examination at an evolutionary vantage. Epidemiology is a science of disease which specifies rates (illness prevalences, incidences, distributions, etc.). Evolution is a science of life which specifies changes (gene frequencies, generations, forms, function, etc.). 'Evolutionary Epidemiology' is a synthesis of these two sciences which combines the empirical power of classical methods in genetical epidemiology with the interpretive capacities of neo-darwinian evolutionary genetics. In particular, prevalence rates of genetical diseases are important data points when reformulated for the purpose of analysis in terms of their evolutionary frequencies. Traits which exceed prevalences beyond the rates of mutation (in Hardy-Weinberg calculations) or evidence unusual range of phenotypic reaction are of special interest. This is

because traits which did not confer advantages in the environment of evolutionary adaptation cannot accede, through natural selection, to anything but low rates of genomic prevalence.

Evolutionary epidemiology is, in all of medicine, of particular promise in ongoing efforts to better understand psychopathology. Many complexities of phenotypic adjustment arise when new developmental demands are placed on an 'old' genome. The new and complex biosocial ecology of human mass society now evokes different phenotypes than those in the prehistorical ecology to which the genome is structurally and functionally better adapted. Some of these new phenotypes are darwinian failures. In this paper, the theoretical implications of evolutionary epidemiology are extended and some tentative points of clinical application (particularly to psychiatry) are offered.

Wilson DR: Ideas in theoretical biology: Autologous clones Acta Biotheoretica 1993;41:267-269

Extracted Quotes: One general theme of note is the parsimony by which novel uses are made of extant forms or functions. These have been termed "exaptations" with respect to unexpectedly propitious adaptive value. Exaptations are those existing traits which inadvertently become highly adapted to new selective pressures. Generally exaptations are terminal modifications of recent evolutionary forms or functions rather than alterations of deeply canalized evolutionary traits.

...The homeobox system of supragenetical control of genomic development is curious as an example of fundamental parsimony and exaptation. The homeobox generally specifies (in all but the most proximal and idiosyncratic aspects) the phenotypic development of all multicellular organisms. As such, the homeobox is among the most deeply entrenched features of genome structure and evolution - a stable feature of the most simple multicellulates to the most complex social insects and mammals. It is the basic plan by which all higher zygotes are oriented for subsequent linear development. It is something of a 'Rosetta Stone' or 'blueprint' whereby phenotypes are constructed. Whole evolved schemae appear to have

derived from a single homeobox innovation. This is a most compelling example of the extraordinary biochemical economy and elegant parsimony by which darwinism can sometimes work.

... The sigma receptor system has been noted to cross-regulate neural, endocrine and immune function. Such cross-linkage points to a common phylogenetic descent of these systems from common ancestral tissue. Embryological studies also point to such evolutionary unity insofar as these systems are, in part, derived from primitive ectodermal genes. Thus, peptide function and structure demonstrates fascinating parsimony in evolution. In darwinian terms the endocrine and immune systems can be said to have arisen from a common neural primordial ancestor. Likewise, specific molecular constituents of these systems appear to be phylogenetically related, not merely evolved homologues....

Kappen C & Ruddle FH: Evolution of a regulatory gene family: *HOM/HOX* genes. Current Opinion in Genetics and Development 1993;3:931-938.

Abstract: With the increasing accumulation of data on the presence of the *HOM/HOX* class of homeobox genes in the animal kingdom, and with new comparative analyses of these data, strong evolutionary conservation is apparent. It is clear that *HOM/HOX* genes and their roles in pattern formation were established early during the evolution of major phyla. The functional indications that this system is utilized in quite diverged organisms attest to the fundamental roles of homeobox genes in organismal development.

Introduction: The homeobox was discovered as a common DNA sequence element in homeotic genes of the fruit fly *Drosophila*. The 183 base pair stretch of nucleotides encodes the homeodomain (61 amino acids), which is capable of binding DNA. Homeodomain-containing proteins are thought to act as transcription factors that regulate the expression of genes in a temporal-, spatial- and tissue-specific fashion. The homeobox and related sequences have been found in the genomes of a wide variety of organisms and can be classified into at least 30 distinct classes.

In this review we will focus on the *HOM/HOX* class of homeobox-containing genes. Homeotic genes of the fly

and *Hox* genes of mammals share a common genomic organization, being found in gene clusters (*HOM-C* and *HOX*, respectively). During the development of both flies and mammals, the physical order of genes on the clusters is reflected in their respective region-specific expression domains along the anterior-posterior axis. Mutations in *HOM-C* genes lead to characteristic malformations in the fly, and mice carrying mutant *Hox* genes also exhibit developmental abnormalities. *HOM/HOX* sequences have been found in many species, suggesting an involvement in the developmental processes of diverse organisms. Investigating the conservation of their genomic organization and gene expression may provide insight into the fundamental role of *HOX* genes in the evolution of morphological processes throughout the animal kingdom.

Gilland E & Baker R: Conservation of neuroepithelial and mesodermal segments in the embryonic vertebrate head Acta Anat 1993:148-110-123.

Abstract: The organization of embryonic efferent cranial nerves is addressed here by interspecies comparison of segmentally patterned neuromeres, efferent neuronal populations and early mesodermal sources of target muscles. The segmental constancy of these three structural patterns is evaluated for elasmobranch, teleost, reptile, bird and mammal embryos and compared with the segmentally restricted expression patterns of *Hox* genes. A conserved series of hindbrain neuroepithelial segments (rhombomeres) is present in all of these taxa. Dye-labeling experiments demonstrate that the segmental locations of efferent neurons projecting through individual cranial nerves are likewise highly conserved. Notable segmental variation is however shown in the location of the VI and IX-XII motoneurons, suggesting the likelihood of homeotic-like changes in relations between rhombomere and neuronal 'identity' during vertebrate evolution. Since experimentally induced shifts in expression borders of *Hox* genes appear to be correlated with alterations in segment identity and/or neuronal phenotype, the need for further examination of segmental locations of specific neuronal groups and the segmental expression patterns of *Hox* genes between species is emphasized. Comparison of early cranial mesodermal subdivisions in elasmobranchs with descriptions of somitomeres in amniotes suggests that a series of axially unique mesodermal populations

may also be conserved throughout vertebrates. The possibility is raised that common mechanisms of axial specification may underlie the initial appearance of segmental patterning in both neural and mesodermal layers during gastrulation. Implications of these conserved patterns for understanding the phylogenetic origin of the vertebrate head are briefly discussed.

Extracted Quote: Given the suppositions that a broadly conserved axial pattern of correlated neural and mesodermal units exists in vertebrates and is correlated with the expression domains of many developmental regulatory genes, morphological and molecular comparisons of more distantly related species may allow more insight into both the origin of the vertebrate head and segmentation. Holland et al. began searching for amphioxine homologs of members of the vertebrate Hox cluster and cloned a sequence homolog of paralog group 3, named

AmphiHox 3. This gene was expressed in the neuro-epithelium along a domain extending from the blastopore region up to an axial level between somites four and five (see figure below).

... If homologies can be further verified within the prevalent view that cephalochordates (acraniates) are the closest relatives of vertebrates (craniates), then comparison between the cranial region of vertebrate embryos and the primary gastrula of amphioxus appears to be the best available estimate of the phylogenetic states involved in the evolution of the vertebrate head. The orthodox hypothesis also implied by this comparison emphasizes a point that seems to be lacking in recent discussions. Namely, that the vertebrate head is directly homologous with the entire primary gastrula of an ancestral chordate. This hypothesis also implies that attempts to derive the vertebrate cranial plan, especially that of cranial nerves, from a primitive metameric trunk plan are misdirected. The task is not to derive the vertebrate head from a primitive chordate larval trunk plan, but rather to deduce how the head was generated from the primary organizer and early gastrula of the hypothetical ancestor. In effect we propose that the process of craniogenesis during gastrulation is the proper structural starting point for detailed analysis of the hypothesized critical roles of neural crest and brain segmentation in the emergence of the chordate head.

Even if the chordate gastrula is the epitome of the original vertebrate head, the existence of amphioxus as a stand-in for the ancestral chordate in ontogenetic studies by no means assures the possibility of documenting this fact. The cephalochordates have an independent phylogenetic history extending for more than 500 million years. Thus, understanding the origin of the plan underlying our own heads may rest on the chance that both the genetic and structural mechanisms underlying gastrulation, mesoderm formation and specification along the anteroposterior axis have not been radically altered over that time period.

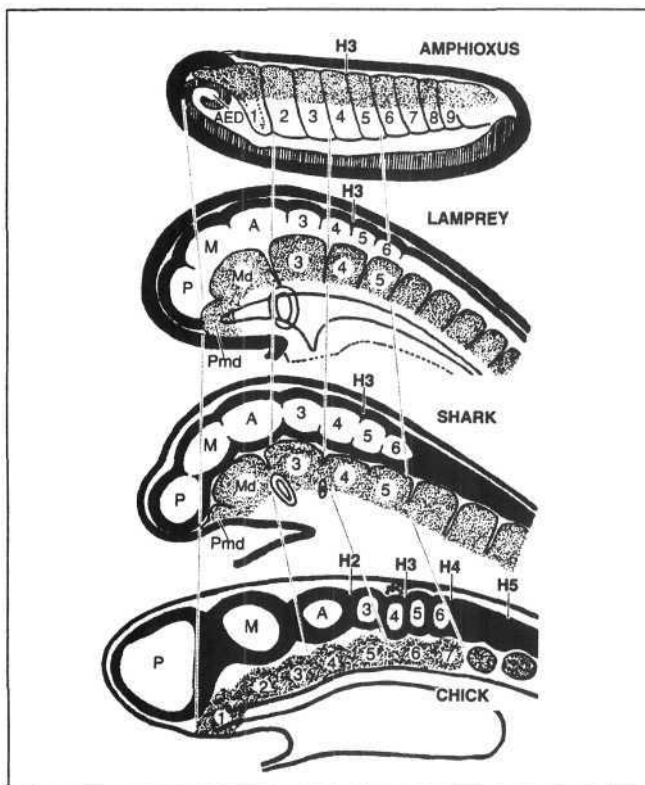


Figure: Comparison of early craniogenesis in representative chordates. This figure is modified after Neal, and incorporates data from Anderson and Meier, and Holland et al., Schematized diagrams of the cranial regions of amphioxus, lamprey, shark and chick embryos are shown from top to bottom. Neuromeric units are unmodified from Neal, but the enumeration has been updated to current usage. Numbering of somite in amphioxus conforms to Goodrich and Holland et al., with the anterior entoblastic diverticulum (AED) remaining unnumbered. The mesodermal and neural units in the lamprey were adopted by Neal from Koltzoff and conform to Goodrich. The mesodermal units in shark are labelled according to Neal's system, commencing with premandibular (Pmd=No. 1) and mandibular (Md=No. 2). Neal's units 1, 2 and 6 correspond exactly to 1, 2 and 5 of Goodrich. Neal's units 3-5 correspond to Goodrich's segments 3 and 4. The somitomeres described by Meier have been added to the chick schematic, with their stage-specific location relative to neuromeres specified according to Anderson and Meier. The rostral expression border of Hox paralog group 3 (H3) are indicated for each species according to the literature for amphioxus and birds. H3 sites for lamprey and shark are theoretical. Homologous regions in these species are connected by the dashed lines, based on comparison of *Squalus*, *Chelydra* and *Gallus*.
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