

ASCAP

Volume 7. No 11, (Cumulative #84)

November 1994

"Direct confrontation of ideas becomes an absolute necessity in an area where new frontiers are emerging."
Giorgio Bernardi ¹

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. The ASCAP Newsletter is a function of the ASCAP society

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

ADDRESSED TO & FROM ...

BECK AWARD LETTER

The following letter will be distributed nationally and internationally:

October 31, 1994

Dear Chair/Director of Training:
The ASCAP Society is sponsoring a competition for residents and fellows in psychiatry and related clinical fields, and for graduate students in psychology, biology, anthropology and related academic disciplines, and for recent graduates of such programs (within seven years of terminal degree).

Our award, **The Aaron T Beck ASCAP Award**, will be given for the best previously unpublished paper related to the subjects of evolutionary biology and psychopathology.

The ASCAP Society is an international group of clinicians and academics who are linked by a common interest in evolutionary biology and how this perspective might inform our work and research (ASCAP refers to Across-Species Comparisons and Psychopathology).

One of our members, Dr Beck, whom we are honoring with this award, suggested that we focus on how an evolutionary approach can be used to integrate various levels of understanding and thereby generate new or broadened perspectives in psychopathology. There are many possible topics including, to name a few, comparative psychology and psychiatric illness, comparative brain

anatomy and behavior, relations of attachment processes and social rank hierarchy, psychiatric drugs as probes of system function, psychotherapy from an evolutionary perspective, and contemporary evolutionary theory and psychoanalysis.

The Aaron T Beck ASCAP Award will be presented at our annual meeting to be held in Santa Barbara, California, on June 27, 1995. The award carries with it a cash prize of \$1000 (to support trip expenses). Our meeting will be held the day before the annual meeting of the Human Behavior and Evolution Society at the University of California at Santa Barbara.

We take this opportunity to ask you to notify residents, graduate students, fellows, and recent graduates of your department about this competition.

All participants should send three copies of their paper to:
Mark Erickson, MD - ASCAP Beck Award, c/o Russell Gardner, Jr., MD, Department of Psychiatry & Behavioral Sciences, 4 450 Graves Building (D28), University of Texas Medical Branch, Galveston, TX 77555-0428. The postmark deadline for entries will be March 31, 1995. Do not hesitate to call (409-772-7029) for further information about the Beck Award or the ASCAP Society.

Sincerely yours,
Mark Erickson, MD.
San Francisco CA, USA

A BONOBO BALLET

I would need to be an artist to share my experience of visiting, the other day, a small colony of Bonobo chimps at the Twycross Zoo, 40 km north of Birmingham, England. The Zoo is flourishing and the best kept of any I have seen in this country. All enclosures are surrounded by 12ft high shields of toughened glass, as much to protect the inmates against infection from the public as vice versa. Each major group of animals have their own special keepers. Betty, the Bonobo's keeper, came with my wife, myself and a non-zoological friend to view them with us. It was a wonderful, sunny October day, the air still and warm, and hence the Bonobos had access to their large outdoor enclosure. This was made of a grassy mound which sloped down into a moat 8 ft deep and was topped with many tall bare "trees", logs, etc. There were two adults with an infant born this year, and an adolescent male and a young female.

When we arrived outside the enclosure, all, except mother and her infant, who were totally engrossed in each other, rushed out and greeted us by waving their arms at us, and when we waved back, they "jumped for joy".

Then Tizy (I can't remember his real name), the adult male, whirled around with arms flailing, as if caught up in his own local whirlwind. I've never seen an act like it. It made us all gasp in

astonishment, except for Betty, who clapped. When he stopped, Tizy clapped his hands back at her. Meanwhile, to our right, the young female started rolling over into an animated ball which changed direction without rolling into the moat. Then Tizy stood on his hands, and for a moment or two, held his feet in the air; chases between him and the young, the young chasing him as well, followed between repeated hand clapping. He then played hide and seek with me when I dipped beneath the parapet and turned up in unexpected places. Periodically, when Tizy became very excited, he would toboggan on his hands and belly into the moat: all this interspersed with long periods of looking intently at us as we laughed and joked - providing him with an equally arresting spectacle. As an expression of acrobatic "inventiveness" in the HEDONIC MODE, a clown could not have done better.

I felt Calvin's pertinent remark about stringing things together was illustrated in the acrobatics of this Bonobo Ballet.

Bonobos, for those who have not seen them, possess jet black hair all over the body and parted down the middle of the long hair on top of the head, looking, to our eyes, very handsome.

Michael Chance
Birmingham, ENGLAND

DEVELOPMENT OF FEAR

Russell Gardner expressed an interest in my paper on emotion,

so I am enclosing a set, together with a manuscript of the paper I presented at Toronto. [*Editor's note: See article on page 14 for a list of publications.*]

Incidentally, the paper on the "Development of Fear in Animals" comes from a book which also has a chapter on development in humans. The period of "fearlessness" spoken of by one of the contributors to the Toronto meeting is quite well known, and I deal with it in the case of animals ~ but the same principles apply to man.

Eric Salzen
Aberdeen, SCOTLAND

ON EMAIL

The entire world has heard of email and Internet; billions of messages are worldwide taking on an evanescent cyberspace life of their own. Paul Gilbert, just coming on to this in Derby, urged me to make an editorial note for some of the messages that have sociophysiological import. With his keen interest in the technological cutting edge, John Pearce has pioneered an ASCAP network and is also important in the HBES listing. If you want on to that one, notify him at JKP@world.std.com.

In addition to these, I've been involved for the last several months on the InterPsych which stems from Britain on lists named Depression, Helplessness, and Psychiatry. There are others, many others. John Pearce recommends Psychopharmacology. At the University of Michigan, Milton Huang tells me with Randy

Nesse's urging he has started a website for the department and assumed I would know what WWW was (I somehow think of World-Wide Web), but in fact these are the jargons of the next generation and I limp along watching in admiration.

Many in the younger generation, such as Milton, and Mark Stevens at UTMB, who seem to have come to professional maturity speaking this language, have many ideas about what to do next. They know vocabulary, history and circumstances including the financing. I know from my computer screen that InterPsych is apparently in trouble lately because there are relatively few English users (many worldwide), and their funding agency wants to know why they should disproportionately help the rest of the world. Mark tells me that this has much to do with the expensiveness of long distance communication, either trans- Atlantic cable or satellite. I know that it helps to be at a University; UTMB, for instance, pays for its faculty and staff to do in-house business with email. Eventually paper memos will be replaced.

But practically speaking I have been involved directly, participating in "threads" similar to those in [ASCAP](#) but on a shorter time constant. Indeed, I have already asked several commentators for permission to reprint their email message in [ASCAP](#). So far, Ms Ainsbury tells me, we don't have much room, what with the priorities of other ASCAP submissions.

But I have permission for a description of a few threads that persisted for a few days or even weeks. Some of them are "flame wars" in that the discussants are clearly very upset (angry) over the topic at hand. For instance, a Szaszian advocate held forth on issues typified by a recent title he used, IF YOU SEE A SHRINK ON THE STREET, SHOOT HIM. He was extruded from the list for earlier similar statements (later he was reinstated, but in the meantime, I sent a direct message to him as I was writing for something else on Szaszian beliefs). The next thing I knew, the debate with my material edited to help him make his points was on the email. He admitted to me in a direct message that I made some good points, but proceeded to deny blandly my perception of reality.

Compared to a medium such as this hard-copy newsletter, the email has an evanescence on the one hand, but directness on the other. It relieves a kind of isolation, perhaps, and surfaces some resources otherwise not available. For instance, a person who is open about having experienced mania personally and who is also a political scientist agreed to read some chapters from my manuscript on leadership that uses mania as a pathological model of a leadership communicational state. She has been reinforcing while not mincing words about problems.

There has been some polite interest "on the net" in ASCAP-related affairs. I've put

forth some of the involuntary subordinate strategy issues and there was for a while a thread of interest in the idea of calling depression adaptive.

I quote the following with permission from Bob Buckley, an emergency room psychiatrist in San Francisco, who has an enthusiasm, empathy and fundamental good sense on each of the multiple lists on which I have seen his messages; this is one of 22 July 94 after I put something forth on adaptive features of depression:

I am intrigued by the point of view you represent. Of course, it is entirely possible to envision [something] as "adaptive" in one sense and simultaneously a "disease" in another. The well-worn example of the constellation of sickle-cell trait, malaria, and sickle-cell anemia could serve as a more concrete model of such an arrangement.

"Disease" is almost always labelled as such within a particular world view. Thirty years ago (I'm making a loose guess at the actual timespan) Bulimia was not a disease. It was just people throwing up. Not until we began to perceive a pattern, and after social forces began to intensify and spread the behavior did we label it "disorder". But voluntary vomiting has always been a potentially (sic - this is the email method of underlining) adaptive thing to do, and it is certainly part of the mammalian repertoire (as my dog can demon-

strate any time you like).

So from this perspective I have no trouble seeing depression as a behavior that has always been potentially adaptive and which may have its adaptive uses still.

The clinician, then, proceeds to treat these constructed entities as though they were real things; and if the clinician has any knowledge of the history of medicine, he or she may do so with the discomforting sense that he'll look pretty silly. But there it is... it looks like a disease, everybody says it's a disease, so we are expected to do our duty and treat it like a disease.

Meanwhile, it's enlightening to consider that we may have this whole thing backwards and inside out, and to entertain other interpretations of what the data mean.

One person with sexual abuse trauma became inflamed at these ideas, expressing suicidal ideas even. Dr. Buckley and others sent a message that he shared with the group (he-feels-like-a-very-good-doctor; I know that Thomas Joiner the UTMB depression "listowner" did as well.) The troubled person apologized profusely later and was obviously all right, contributing freely as time went on. But I believe this illustrates the powerful nature of this kind of communication and how different it is from the paper printed medium.

Russell Gardner, Jr.
Galveston TX, USA

ARTICLE: A review: "The Social Cage: Human Nature and the Evolution of Society."¹

To a believer in E.O. Wilson's prediction, that awareness of evolution would eventually pervade the social sciences, any sociology book that takes primate social organization as a point of departure for an analysis of human social behavior brings some of the delights of vindication. So I was excited to come across Roger Masters's glowing review of The Social Cage. Here's an excerpt:

*Maryanski and Turner's The Social Cage may be one of the most important works in social and political theory published in the last decade, integrating the study of human evolution, primate social behavior, cultural history, sociology and political science... Theoretically, their work has the scope of Rousseau's Discourse on Inequality or Marx and Engel's German Ideology...*²

Since Masters is the foremost exponent of the evolutionary view in political science, I made haste to the library. At first, I was enthusiastic. Maryanski and Turner do take evolution seriously, and for quite a few pages they seem to be applying lessons they learned from it.

But as I read more, I became skeptical and began to wonder about Masters' praise.

Let me briefly review the argument of the book. The authors contend that the "last common ancestor" of apes and humans had a fluid social structure with weak, loose social ties, and few enduring bonds beyond mother and offspring. They argue that because both males and females dispersed at puberty, group continuity was weak, favoring high individuality and creating selection pressure against kinship alliances.

The authors arrive at their reconstruction of the "last common ancestor" through a comparative analysis of the existing ape social structures. I am not qualified to evaluate this reconstruction, but I have no quarrel with the idea that apes have a higher degree of

individuality than other primates.

The reconstruction leads to an obvious conclusion: human have high individuality in their genetic history. No problem there.

The authors are aware that when hominids, the descendants of apes, moved to the Savannah, a way of life based on greater cohesion did arise. But - and here's the rub - they claim that this way of life hasn't lasted all that long and didn't require much genetic change.

According to Maryanski and Turner, the hunter-gatherer lifestyle did NOT create selection pressures favoring sociality, group living, social bonding and strong group ties. Nor was any genetic tendency toward aggression, hierarchy and territoriality embedded in the genes. Rather, there was selection for communication and organization (see for example page 73).

The bottom line: "Any other presumed genetic changes - say the human sociobiologists' emphasis on kin selection and inclusive fitness, altruism and reciprocal altruism ~ are unwarranted speculation" (page 89).

Take that, Hamilton, and you, Trivers.

There is a corollary. The brain, they argue, expanded just to increase the ability to communicate, to use tools, to manipulate symbol systems, and to exploit the possibilities of culture, not to process particular types of recurring social problems.

Get thee behind me, Tooby, and Cosmides, too.

Nevertheless, Maryanski and Turner have got their teeth into an important theme - the relationship between human nature and the various types of social organization, including horticulture, agriculture and industrial civilization. This is a territory that I've

explored somewhat so I was very interested.

A good deal of what Maryanski and Turner say dovetails with what John Pearce and I said in Exiles From Eden³ and what Gary Bernhard and I wrote in Staying Human in the Organization, our book on organizational behavior.⁴ In brief, we all agree that humans are better adapted to life in hunter-gatherer bands than to life in horticultural and agricultural societies. In the language of Maryanski and Turner, horticulture puts us in a cage formed by kinship bonds, and agriculture puts us in a cage formed by the power of elites. The descendants of apes don't like cages.

When it comes to industrial society, however, Maryanski and Turner's views diverge from mine. They argue that industrial society is less at odds with human nature because it allows for more individuality.

Is there any merit in this view? Well, for some people, perhaps. Industrialization has increased social mobility, freed people from the tyranny of gossiping neighbors, created cities that provide anonymity, and made it possible for some people to become their own bosses.

Furthermore, historically, there is an association between industrialization and democracy, and I would agree that democracy contains features that appeal to a species genetically adapted to hunting and gathering. Democratic *ideals* echo many features of life in those ancient roaming bands: basic equality, absence of institutional hierarchy, social mobility, leadership by ability, and freedom from despotic authority.

And it is true, as Gary and I argued in Staying Human, that the current wave of "learn building" (Total Quality Management, etc.) in industry clearly reveals a blind groping toward a social arrangement similar to that of a hunting-gathering band.⁴ I suppose if you extrapolated the team-building trend into the future and into society at large, you would get something fluid and loose enough for the descendants of the apes.

But you would also have something that was based on face to face contact and personal feelings of reciprocity, that operated through consensus, that achieved order through conformity, because of powerful emotional responses to approval and disapproval.

The Maryanski and Turner approach seems wrong-headed for another reason. Team building is hardly the only trend in society. There are also such details as the massive growth of government, the massive increase in inequality, the loss of control over decisions affecting one's life, the breakdown of the family, and the "cage of mindless, repetitive work", to name but a few.

Is it just an accident of culture that anomie and alienation, depression and anxiety, disaffection and cynicism, are so widespread where social ties are weak? Is there no genetic rationale to the desperate utopianism of communism and to the enduring if slightly less messianic appeal of socialism? Why do people hunger for friendship? Why do they associate in groups? Why do they suffer so from ostracism and isolation? Why the craving for approval? Why, as Schacter, Ash, and others showed during the 50s, do people conform so abjectly in small groups? Why do kids go bad when families don't provide stable long-term care? Why "co-dependency"? Why Kennedy-type liberalism? etc. etc. Can all these phenomena be consigned, along with kinship ties and reciprocal altruism, to the realm of the purely cultural?

Industrial civilization may have released some of us from certain cages, but it has abandoned us in a social and emotional wilderness. Furthermore, as Masters correctly notes, the failures of industrial society can lead to the recreation of "the cage of power", as happened in Nazi Germany and the Soviet Union.

How could Maryanski and Turner overlook the fact that people in modern societies are suffering from an insufficiency of social goodies? More important even, why would anyone WANT to oppose individuality to the social? Is it necessary to argue that just because humans are individualistic, self-reliant and mobile,

they are not at the same time genetically predisposed to live an orderly life in groups?

At one point I thought that Maryanski and Turner might have an ideological commitment to free-enterprise capitalism. So I am going to hazard another hypothesis. I suspect that the purpose of the book, consciously or not, was not so much to promote the study of evolution, but rather to rescue sociology. By reaffirming the transcendent importance of "culture" and preserving the sainted notion of human uniqueness, the authors carve out a role for their discipline. If the social is not genetic, then it is the proper domain of sociologists, not evolutionists. Indeed, The Social Cage may be a harbinger of an increasingly sophisticated attempt to counteract

the influence of evolutionary ideas.

I see a vast tableau here: Sociology, like the Phoenix, emerging triumphant from the struggle with sociobiology. Perhaps an unemployed ex-Soviet Socialist Realist could be found to execute it.

I could be wrong about the book. I find it hard to believe that Roger Masters could have missed something as important as this. Was he being kind in order to encourage more sociologists to delve into human evolution? Perhaps he can be induced to respond in these pages.

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by M Waller

ARTICLE: **With trepidation, King Solomon ...**

Although the Bible does not tell us so, I suspect that the price King Solomon paid for his adjudication over the matter of the disputed baby was the lasting enmity of both parties. That of the true mother because he held her child upside-down and threatened to chop it in half, that of the rival claimant because he spoiled her game plan. Conclusion: only a fool intervenes between strongly committed disputants. So here goes!

I find the Birtchnell-Sloman (JB-LS) exchange deeply instructive (see earlier ASCAP issues, June and August, 1994), and it seems to me clear where the tension lies. JB is offering us a two axes theory which is powerfully grounded in clinical experience and every day observation whilst LS is endeavouring to force-fit this to the unidimensional idea of the Involuntary Subordinate Strategy (ISS) which seems equally powerfully grounded in modern evolutionary theory. The theoretical underpinnings upon which LS relies deserve restating. When John Price first started working in this area there was (and still is) a bedrock belief which had at all costs to be accommodated. This is that as evolution is essentially a matter

of reproduction, any persistent pattern of behaviour which acts against reproduction must be self-eliminating. John therefore reasoned that although mood disorders are self-evidently reproduction-negative in the short-run, they must have persisted over evolutionary timescales on the principle that "he who fights and runs away lives to fight another day". This led him to formulate the idea which we are now calling the ISS. From this he deduced that at least in some instances people who suffer chronically from depression, or a predisposition towards social isolation, are victims of an overactive ISS. Overactive because, although becoming quiescent or withdrawing are fine as strategies for dealing with an immediate crisis, as consistent evolutionary strategies they stink. And by extension this is taken to imply that even if somebody appears to be happy with a continual state of lowerness, or of distance, from an evolutionary perspective they must be viewed as in some way behaving dysfunctionally.

My own position is that the ISS school has been driven to this fairly extreme position because it has been sold a dummy by evolutionary biology; a

dummy which has forced some of the most creative minds I have come across to attempt continually to shoehorn the rich variety of social life into an exceedingly narrow theoretical base. And this is precisely the treatment about which JB is complaining. I will not here restate my own views other than to reiterate my core beliefs that (a) in evolutionary terms it is genes not individuals which count; and (b) it is quite possible that causing the least well fitted of its bearers to behave in a dysfunctional way is actually in the evolutionary interest of the genes responsible. However, that said, there can be no doubt that ISS theory is an evolutionary theory of behaviour and emotional life, i.e., it seeks to explain the persistence of the behavioural and emotional phenomena with which it treats in terms of the adaptive advantages they are believed to confer.

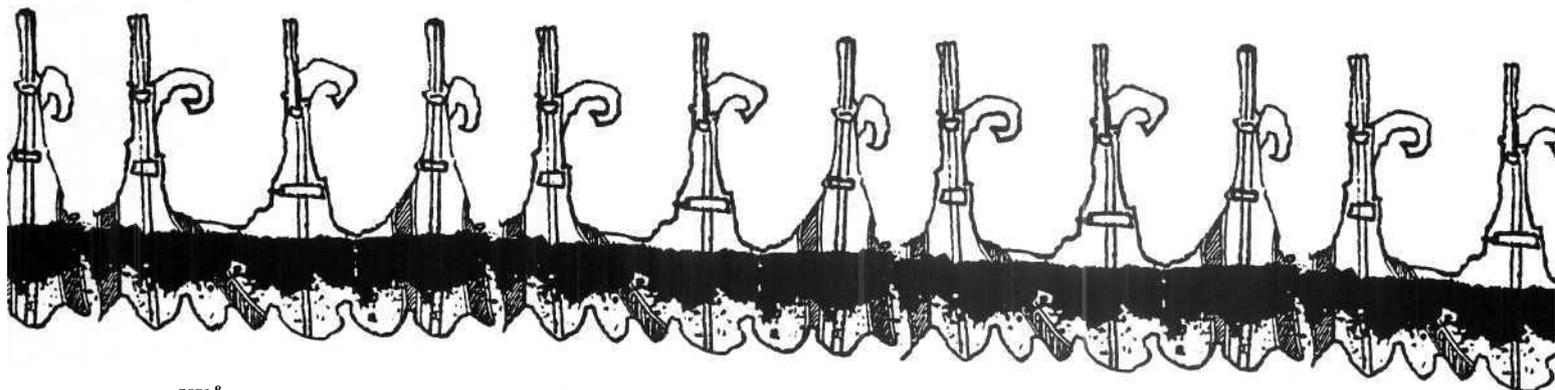
Having stirred up the first, I am now going to stick my head in the second lion's mouth. On the basis of the material so far presented in the Newsletter (no, I have not yet read the book, but I promise faithfully that I will) I am not clear that JB's theory is an evolutionary theory in this strict sense. My own contention is that if JB takes up the challenge his ideas would powerfully illuminate the evolutionary debate, but at present they seem to be more a systematic structuring of the world of interpersonal psychology, than an attempt to explain the evolutionary origins of the eight pure types he identifies on the spectrum of human behaviour. I mean by this that although he postulates the existence of positive upperness, positive distance, positive lowerness, positive closeness, negative upperness, negative distance, negative lowerness, and negative closeness, I am not clear that he suggests how these have evolved either individually or in groups. I am abso-

lutely sure that each of these states exists and that they are all clearly distinguishable; but what I would particularly like is clarification as to how JB explains the evolutionary persistence of the negative subset. For my money I am not convinced that in meeting this request he can reasonably call on ISS. His concept of positive lowerness seems fully to accommodate the types of behaviour which really constitute an evolutionary stable involuntary subordination strategy, i.e., a strategy which entails subordination for just so long as this is prudent and then allows a smooth shift into some other mode when the opportunity affords itself. Hardly a description of the average chronic depressive.

In short, I am asking JB a slightly modified version of the question John Price first raised about twenty-five years ago:

"States of (negative upperness, negative distance, negative lowerness, and negative closeness) are very common. Possibly one in seven of the population consult their general practitioners every year for some emotional disturbance. Why should this be so? We are the result of a process of natural selection, the length and ruthlessness of which confound the imagination. It is known that the severer mental disorders are associated with reduced fertility, and it is more than likely that under primitive conditions even the milder states... conferred a disadvantage in the struggle for survival. Why then are we as a species lumbered with these most disagreeable tendencies - why are we not all paragons of calm energetic happiness?"¹

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ARTICLE: The Westermarck trap: a possible factor in the creation of Frankenstein

Summary

Sexual inhibition between children brought up in the same household was described by Westermarck, and has come to be known as the "Westermarck effect". It applies not only to siblings but to unrelated children who are brought up as "foster-siblings". When parents expect such children to marry, we may speak of the "Westermarck trap". This trap is depicted in the novel Frankenstein by Mary Shelley, in which Victor Frankenstein is expected to marry a cousin reared with him. Instead, he creates a monster which persecutes him and murders his prospective bride before the marriage can be consummated. It is suggested that the plot owes something to Mary Shelley's own experience of the Westermarck trap, following a childhood in which she was reared with a step-brother. Her own personal solution was not to create a monster but to elope with a married man (Percy Bysshe Shelley) at the age of 16. It is speculated that the sensitive age for the Westermarck effect may be different for pairs of siblings and for adult and child.

Introduction

Over a century ago, Edward Westermarck gathered evidence concerning the mutual sexual indifference of people brought up as "housemates".¹ He wrote:

Generally speaking, there is a remarkable absence of erotic feelings between persons living very closely together from childhood. Nay more, in this, as in many other cases, sexual indifference is combined with the positive feeling of aversion when the act is thought of. This I take to be the fundamental cause of the exogamous prohibitions. Persons who have been living closely together from childhood are as a rule near relatives. Hence their aversion to sexual relations with one another displays itself in custom and law as a prohibition of intercourse between near kin.

He pointed out that in cultures in which married sons live with their parents it is usual for marriage to be

prohibited between cousins whose fathers are brothers, whereas cousins related through the female line (who are brought up in separate households) are permitted to marry. This instinctive aversion to sexual feelings between those brought up together has become known as the "Westermarck effect".

Mark Erickson discussed Westermarck's hypothesis from the point of view of evolutionary biology, and he added the observation that the inhibition of sexual bonding is accompanied by familial bonding which leads to mutually altruistic behaviour.²³

There are two separate parts to the hypothesis, one relating to the parent/child relationship and the other to sibling relationships. In the case of parent/child, the hypothesis is relevant to the difficulties that step-parents have with step-children: if the step-parent enters the family after the child has passed the sensitive age, which ends about age 6, there may be a lack of familial bonding giving difficulty in getting along together and thus to physical abuse of step-child by step-parent, and also lack of inhibition of sexual bonding, giving rise to an increased risk of sexual abuse of step-child by step-parent. In the case of siblings, difficulty arises when siblings are reared apart, and so lack the sexual inhibition, or when unrelated children are raised together, giving a sexual inhibition when none may be intended, expected or desired. It is this latter situation that I should like to address in this essay.

Erickson described the Simpua marriages in Taiwan, in which children are affianced in infancy, and the prospective bride is brought to live in the boy's household at a very early age, so that the prospective marriage partners are virtually brought up as brother and sister; in adult life the couples tend to have sexual difficulties.² In such cases, the Westermarck effect could be called the Westermarck trap, or possibly even the Westermarck double-bind, because through one channel of influence the parents insist that their child mate with a certain

person, but through another channel of influence (bringing the girl to live in their home as a baby) they make it impossible (or at least difficult) for their child to mate with that person.

I should like to describe an example of this phenomenon which is depicted in a novel. The novel is probably the most sophisticated form of projective personality test, for "any character in a novel stands for multiple aspects of the author's psychic life".⁴ When much biographical information is available about the author, there exists the possibility of comparing the characters and events depicted in the author's work with what is known about his or her private life. Although there are limitations in this "single case study" approach, the richness of detail gives something which large data collections are liable to miss.

The writing of Frankenstein

Mary Shelley started writing Frankenstein when she was eighteen, and had returned with Shelley to Switzerland where they had eloped in 1814. She and Shelley had with them her step-sister Claire Clairmont, who at the time was pregnant by Lord Byron who was living in a villa a few hundred yards away with his personal physician. In June, 1816, having read some ghost stories together, the five of them agreed that each would write their own ghost story, and after several days in which no inspiration came to her, Mary suddenly conceived her plot and started to write. Frankenstein was completed in May, 1817, and published the following year.⁵

During the year that it took her to write the novel, Mary suffered a number of life events. In October, 1816, her half-sister Fanny committed suicide (possibly on learning that Mary's father was not also her own father); in December, Shelley's wife Harriet committed suicide, and on 30 December Mary and Shelley were married. Mary lived in London, separated from Shelley because of the latter's debts: Shelley was able to visit her only on Sundays when the bailiffs were not allowed to make arrests. This was from September, 1816, when they returned to London, to March, 1817, when they moved to Marlowe. During this time Mary had with her their

son William, born January, 1816, and towards the end she was pregnant with Clara (born September, 1817). In March, 1817, Shelley lost an application for custody of his children.

The plot of Frankenstein

The novel has a Chinese box or Russian doll design. In the outer layer, a traveller, Robert Walton, who is searching for a passage to the supposed warm sea at the North Pole, describes his adventures in a series of letters to his sister back in England. Walton rescues Victor Frankenstein who is then chasing the monster across the ice. Frankenstein describes to Walton the creation of the monster and his subsequent dealings with it, including a long passage in which the monster describes to Frankenstein the events which followed its creation.

Victor Frankenstein (he relates to Robert Walton) was the son of a nobleman of Geneva. He was only "about five" when his father brought into the home a girl of the same age called Elizabeth. It was the "dearest wish" of his parents that Victor should marry Elizabeth, but although the two young people showed every evidence of familial bonding, there was no spark of romance or sexual attraction between them. Nevertheless, they were engaged to be married by the time of his mother's death, when she "commends the girl to take her place".

At university Victor studies natural science, and becomes interested in the creation of life. "He fashions a gigantic man out of dead tissues and animates the creature with an electrical spark, but is instantly revolted by the grotesque being he has created and wishes it were dead".⁶ He abandons the creature and has a nervous breakdown, and then returns home when he hears that his younger brother William has been murdered. He discovers that his creature has committed the murder and implicated an innocent girl, who is executed.

When Victor shows evidence of depression, his father suspects that he might be having a problem with the prospect of marriage to his foster sister, and addresses his son as follows:

I confess, my son, that I have always looked forward to your marriage with our dear Elizabeth, as the tie of our domestic comfort, and the stay of my declining years. You were attached to each other from the earliest infancy: you studied together, and appeared, in dispositions and tastes, entirely suited to one another. But so blind is the experience of man, that what I conceived to be the best assistants to my plan, may have entirely destroyed it. You perhaps, regard her as your sister, without any wish that she might become your wife. Nay, you may have met with another whom you may love, and, considering yourself bound in honour to Elizabeth, this struggle may occasion the poignant misery which you appear to feel. (See Footnote 1)

Victor, perhaps not the most insightful of fictional characters, denies any impediment to his forthcoming marriage:

My dear father, re-assure yourself. I love my cousin tenderly and sincerely. I never saw any woman who excited, as Elizabeth does, my warmest admiration and affection. My future hopes and prospects are entirely bound up in the expectation of our union.

Then, at the top of an Alpine glacier, he meets the monster who gives him a detailed account of his life, and how he managed to educate himself in spite of a total absence of care from his creator. He tells Victor how everyone recoils from his ugliness, and makes Victor pity him to such an extent that Victor agrees to his request to create a female monster to provide a mate for him. However, having almost completed the female creature, Victor changes his mind and destroys her. The monster promises to be with Victor and his bride on their wedding night. As the wedding approaches, Victor's confidence in the match lessens:

As the period fixed for our marriage drew nearer, whether from cowardice or a prophetic feeling, I felt my heart sink within me. But I concealed my feelings by an appearance of hilarity....

Four pages later Victor marries Elizabeth, but the marriage is not consummated. On their wedding

night he sends her up to bed but does not join her. Instead he paces up and down searching for the monster, when he hears a shriek, and finds his bride lying murdered on her bed.

He then chases the monster across Europe, finally following him onto the polar ice-cap where he meets Robert Walton to whom he relates his life story and then dies. The monster then expresses guilt to Walton about his creator's death, and promises to immolate himself in atonement.

The sibling incest theme

In the novel, Elizabeth and Victor were brought up together in the same household from the age of four onwards, including two of the years which are thought crucial for inducing the Westermarck effect. In the first (1818) edition of the novel Elizabeth was an orphaned cousin, but in the revised edition of 1831, the author converted her into an unrelated person (Footnote 2).

An exchange of letters between brother and sister is the outer shell of the novel. It may be significant that Mary Shelley depicts a brother setting off far into the polar wastes in search of a sea route to the North Pole, leaving his sister back home, thus eliminating any possibility of sexual bonding between them; and at the same time he writes to the sister detailed letters about his travels, demonstrating the strength of familial bonding between them. This safe sibling relationship in the shell of the novel contrasts with the predicament of Victor and his foster sister, who are expected to achieve sexual consummation but fail to do so.

How could this sophisticated portrayal be accomplished by Mary Shelley at the age of 18? Here we should look at the childhood of Mary Shelley, well documented in the letters and journals of her family.

The childhood of Mary Shelley

Mary Shelley's parents were both famous authors.⁵ Her father, William Godwin, was a non-conformist minister whose most famous work, Enquiry Concerning Political Justice (1793), was a book that described governments as corrupt and most social

institutions as worthless. He saw man as yearning for perfection and virtue, and felt that such heights could only be reached by use of man's intellect, once man was rid of superstition and emotionalism.

Mary's mother, Mary Wollstonecraft, had already given birth to one child out of wedlock, Fanny, by a prior liaison with an American adventurer, Gilbert Imlay. She was rescued from a suicide attempt after the rupture of the affair, and later met and became enamoured of Godwin. Prior to their meeting in 1792, she had published a remarkable feminist tract, *On the Vindications of the Rights of Woman*, that advocated equal opportunities in the rearing and education of men and women, and characterised marriage as not being essential for happiness. When she became pregnant by Godwin, she forsook those convictions and married him. Young Mary was born in August, 1797. Mary Wollstonecraft died of sepsis some ten days after young Mary's birth.

For three years after her mother's death, Mary (and Fanny) was looked after by a female cousin. Then, when she was three and a half, Mary's father married a widow, Mary Jane Clairmont, who had two children, Charles, aged five, and Claire who was the same age as Mary. Mrs Clairmont, who has been depicted as the prototypical evil step-mother, had one child by William Godwin (William) when Mary was four. Mary was in the habit of spending much time sitting by her mother's grave and reading her mother's published works; her inclusion of Shelley into this ritual contributed to their courtship.

It may be relevant that into her own home, when she was 4, was brought her step-brother Charles Clairmont then aged about 6, and although there is no evidence that any parental pressure was put on Mary and Charles to marry, it may have been her own wonder at her lack of sexual attraction to Charles that gave her an intuitive understanding of the Westermarck effect, and her fantasies of what might happen if she were required to marry Charles that gave her an insight into the dangers of the Westermarck trap. Possibly that led her to escape from the trap herself by flouting all convention and eloping with Percy Bysshe Shelley (then a married man) at the age of 16.

Parent/child incest

Previous psychiatric commentaries on *Frankenstein* have pointed to suggestions of parent/child incest.⁵ Mary Shelley's second novel *Mathilda* (sometimes spelt *Matilda*) is largely concerned with an incestuous father/daughter relationship. This was written while her husband was writing *The Cenci* which deals with the same theme.

Myers claims that: "*Mary's father was seductive with her and obviously was desirous of moulding her in the image of his lost wife*" and he points out the difficult relationship she had with her step-mother who blamed her for her "*Oedipal interaction with her father*".⁶

Myers discusses previous analyses that identified "*the monster as the guilt-provoking child of Victor's wished for incestuous union with his mother*".⁶ This speculation is based partly on Victor's dream:

I thought I saw Elizabeth, in the bloom of health, walking in the streets of Ingolstadt. Delighted and surprised, I embraced her; but as I imprinted the first kiss on her lips, they became livid with the hue of death; her features appeared to change, and I thought that I held the corpse of my dead mother in my arms; a shroud enveloped her form, and I saw the grave-worms crawling in the folds of the flannel.

This passage, which gives an idea of the "gothic" flavour of the novel, could also be used to support the sibling incest theory; the switching of his prospective bride into his mother may represent a dream warning that Elizabeth is sexually "taboo" due to the Westermarck effect.

Did the Victorian nanny abolish the Westermarck effect?

Erickson's suggestion that surrogate parenting may weaken the Westermarck effect could account for the repression of all sexuality among the English upper classes in Victorian times. The extensive use of wet nurses and nannies could have led to such an epidemic of parent/child incest that desperate repressive measures would have been required to prevent it. If the resulting sublimation led to the spread of the British Empire, beware the nation

which approves the nanny.

The monster as a portrayal of psychotic experience

The monster created by Frankenstein has often been said to represent some projection of his creator's mind, and certainly it would fit with this idea that the monster should represent his repressed and projected sexuality, blocked from its natural expression by the Westermarck trap.⁵ This would be consistent with the curious lack of pride felt by Victor in his act of creation, and with his persistent neglect of the monster's emotional and educational needs. It is also consistent with the fact that the main motivation expressed by the monster is the need for a mate, and for Victor's ambivalent response to this need. The monster never has a name, and is often popularly known by that of his fictional creator.

In fact, the psychiatric reader might think that, in the character of Victor Frankenstein, the author were portraying a case of paranoid schizophrenia, were it not for the fact that the explorer Walton, to whom the putative patient recites his narrative, reports to his sister his meeting with the otherwise intangible monster for a brief period on the ice. Apart from this one final contrary indication, there is nothing to indicate the reality of the monster, who is sometimes described in terms typical of paranoid experience; for instance:

I was answered through the stillness of the night by a loud and fiendish laugh. It rung on my ears long and heavily; the mountains re-echoed with it, and I felt as if all hell surrounded me with mockery and laughter. Surely in that moment I should have been possessed by frenzy, and have destroyed my miserable existence, but that my vow was heard, and that I was reserved for vengeance. The laughter died away; when a well-known and abhorred voice, apparently close to my ear, addressed me in an audible whisper - "I am satisfied: miserable wretch! You have determined to live, and I am satisfied."

The experiencing of the monster by Victor Frankenstein could well have owed something to Shelley who suffered from hallucinations and who "could

seldom distinguish between illusion and reality, and told a series of wild tales, usually concerned with his wrongs and griefs and the mysterious phantoms that pursued him, for which none of his biographers, even the kindest, can produce a scrap of evidence ... among the most terrifying spectres by whom Shelley claimed to have been attacked was the famous 'Tanyrallt Assailant'.⁴ His habit of drinking laudanum may have helped provoke these crises".⁹ We know that Shelley put in considerable work on the novel in the year before its publication.

A testable hypothesis

A single literary case study such as this cannot be used to test a hypothesis but it can serve to generate one. In fact the expanded Westermarck hypothesis presented by Erickson contains no less than six hypotheses in one: the development of familial bonding and inhibition of sexual bonding by child towards parent, by parent towards child, and by one sibling towards another.² The factors responsible for these different effects, and, in particular, the ages during which they are developed, may not be the same. In the case of Mary Shelley, a step-mother and a step-brother came into her household when she was aged four. She appears to have developed inhibition of sexual bonding with the step-brother but not to have developed familial bonding with the step-mother. We can postulate that her experience reflects the generality, and that the inhibition of sexual bonding (together with the facilitation of familial bonding) between parents and children is completed when the child is aged four, whereas the same processes between siblings continues until the age of six or more (and may possibly not start until the age of four). This hypothesis is capable of refutation or confirmation by the study of larger samples.

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ARTICLE: Eric Salzen and TASS

We gratefully received copies of Eric Salzen's publications this month. Salzen is a physiologist interested in emotional communication. As this is not an easy subspecialty in physiology proper, he is a professor in the psychology department at Aberdeen University in Scotland instead of a physiology department.¹ We don't know Professor Salzen's particular story but do recall that physiologist Eugene Aserinsky discovered rapid eye movements as a graduate student, but felt so abashed about something that might be related to the unphysiological phenomena of dreaming that he fled his discovery for safer grounds, returning to their study only decades later after others did the initial explorations of the new and to-become-famous continent. In ASCAP, however, we sense that the future basic science of psychiatry will be titled sociophysiology and that there will be no more hesitation in its examination in the twenty-first century if not before than there is in the physiology of sleep and dreams at present.

We in the ASCAP readership are grateful for Salzen's attention to the normal exhibition and development of phenomena core to the clinical and social pathologies. He has an understandable and comprehensive approach to these phenomena.

Salzen's fundamental theoretical framework is "Thwarted Action State Signaling," hence, the TASS in the title of this extract.

Looking over the offerings he provided (see list below of publications), I decided to summarize the core features of his detailed theory paper, "On the nature of emotion," published in 1991 - see reference 9 in the list. He noted that an adequate and satisfactory theory (1) should have a clear and specific concept of emotion distinguishing it from other affective states, i.e., hedonic feelings, moods, and sentiments; (2) must address all phenomena of emotion (behavior, visceral changes, conscious experience); and (3) must answer Tinbergen's four

requirements for biological explanation of behavior (immediate causation, function, development, evolution).

TASS theory includes the following two propositions or assertions:

- (1) The *phenomena* of emotions are:
 - (a) incipient somatic actions or intention movements of consummatory actions and their associated appetitive behaviour that have been strongly aroused but cannot be performed, i.e., they are thwarted action states (unpleasant emotion) or are changing from thwarted action states to consummatory behaviour on release from thwarting (pleasant emotion);
 - (b) visceral changes accompanying the somatic actions (especially those that enhance the perceptibility of the somatic actions);
 - (c) actions with signalling value for social partners (both somatic and visceral - indeed the signalling value may have enhanced the specific expression); and
 - (d) self-perceptions -- both intero- and exteroceptive - which provide self-awareness, emotional experience and the possibility of self-responding and self-control.
- (2) The phenomena are *biologically explained* by:
 - (a) *Causation*: "thwarting" involves strong arousal of an appetite but also simultaneous perception - or cognitive appraisal - of an absence of indispensable stimuli, a physical obstruction, or the presence of simultaneous but incompatible tendencies.
 - (b) *Function*: emotional behaviour signals what is thwarted and aims to motivate social partners in a way that removes whatever causes the aim to be interrupted - emotional behaviour on release from thwarting signals success of any help; it allows consumption and may be reinforcing to the partner; also self-motivation may result from good results that follow.
 - (c) *Development*: emotional behaviour differentiates

in concert with appetitive and consummately behaviours. Empathy follows perception of emotional displays and associated circumstances by others. Self-awareness, self-control and sympathy stem from self-perception of one's own displays as comparable with others - especially vocalizations. Speech development, indeed, completes the process.

(d) *Evolution*: the signal value of intention movements and visceral changes may have been selected for by social partners, resulting, for example, in ritualization, as in the form of special agonistic, sexual, parental, infantile and alarm displays and ceremonies that may have facilitated social responses and helping behaviours. For those of us interested in the prehistory of language, Salzen specifically and interestingly adds, "*Vocalizations produced by these visceral and somatic actions are part of this signalling and at moderate levels of arousal could provide the basis for modulation and evolution into speech.*"

The definition of emotion, according to Professor Salzen, is helped by the etymology: the term stems from the Latin *e-movere*, "to move from" or "to disturb." In the 16th century, it defined social turmoil and agitation, as in "public emotions." By the 19th, it referred to "a disturbance of the mind or affective upheaval" and finally, "a tumult of feeling."

Salzen's concise definition holds that "*emotions are the behavioural, visceral and mental states that occur when activated motivated behaviours are thwarted or in conflict or when they are released from this thwarting or conflict.*"

He offers some other descriptors. *Affect* involves arousal and experience of motivational action states (generic term meaning "disposition" -- L. *affectus*). *Feelings* describe on-going activated behavioural states, i.e., tasting, satiety. *Moods* refer to unactivated motivational responsive states - enduring, metabolic, hormonal in nature. As we already know, *emotions* suggest blocked activated behavioural states. Chronic states result from reminiscence or anticipation of past states. *Sentiments* involve cognitive constructs of feelings,

moods and emotions based on past experience of feelings, emotions and moods -- e.g., patriotic, moral, religious, aesthetic.

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Publications:

1. Salzen EA: Social attachment and a sense of security. In M von Cranach, K Foppa, W Lepenies & D Ploog (eds) Human Ethology. Claims and Limits of a New Discipline. Cambridge University Press: Cambridge, 1979, pp 595-622.
2. Salzen EA: The ontogeny of fear in animals. In W Sluckin (ed) Fear in Animals and Man. Van Nostrand Reinhold: New York, 1979, pp 125-163.
3. Salzen EA: Perception of emotion in faces. In G Davies, H Ellis & J Shepherd (eds) Perceiving and Remembering Faces. Academic Press: London, 1981, pp 133-169.
4. Salzen EA, Kostek EA & Beavan DJ: The perception of action versus feeling in facial expression. In HD Ellis, MA Jeeves, F Newcombe & A Young (eds) Aspects of Face Processing. Martinus Nijhoff: Boston, 1986, pp 326-339.
5. Crawford JR, Besson J, Ellis HD, Salzen EA, Gemmell HG, Sharp PF, Beavan DJ & Smith FW: Facial processing in the dementias. In HD Ellis, MA Jeeves, F Newcombe & A Young (eds) Aspects of Face Processing. Martinus Nijhoff: Boston, 1986, pp 293-301.
6. Ashcroft GW, Palomo T, Salzen EA & Waring HL: Anxiety and depression. A psychobiological approach. Psicopatologia (Madrid) 1987;7(2):155-162.
7. Salzen EA: Why there are 8 categories and 3 dimensions of emotion. Ethology and Sociobiology 1989;10:397-398.
8. Salzen EA: The construction of emotion from facial action. In AW Young & HD Ellis (eds) Handbook on Research of Face Processing Elsevier Science Publishers B.V. (North Holland), 1989, pp 177-186.
9. Salzen EA: On the nature of emotion. International Journal of Comparative Psychology 1991;5(2):47-107.
10. Salzen EA: Why there are eight primary emotions. Int J Psychol 1992;27:p 87.

ARTICLE: Marginalia on beliefs

Here is a parable about paradigms from the nineteenth century.

Once upon a time in 1856, 20 years after Charles Darwin got home from his voyage on H.M.S. Beagle, some fossil bones and a skull were dug out of a cave in the German valley called Neanderthal.¹ By the time Darwin got round to publishing The Origin of the Species in 1859, speculation was rife about whether this might be a human ancestor. It is always this way with reality; if we think it, it will come.

Scientific debate was intense and vitriolic. Surprisingly, the most persuasive of the anti-Neanderthal anti-Darwinians was no stick-in-the-mud old fogey, but the brilliant father of pathology, Rudolf Virchow, who, in addition to devising cell theory, had earned a reputation as a libertarian by fighting at the 1848 barricades.

In retrospect, Virchow's arguments against Neanderthal seem unworthy of him. Even at the time they were hilariously satirized by Thomas Henry Huxley, the only participant in this debate with a sense of humor (and also the one with the best grandchildren). Revenge enough, but in addition, posterity agreed with Huxley. May we all win so well.

Virchow explained away the bones as belonging to some vagrant Russian cossack wounded while pursuing the shreds of Napoleon's army. Likely he had crawled into that cave to die. While his limb bones were a little strange, cavalrymen are well known for their bow legs, and in this case we must consider as well the effects of the notorious Russian malnutrition (this last, although the problem with the bones was that they were far too massive, not too fragile). And those distinctive brow ridges of the Neanderthal skull might seem at first mysterious until one recalls the notorious Russian temperament. All that frowning. (By this point Virchow had become the inventor of the ethnic joke. Why do Neanderthals have round shoulders and flat foreheads? Because when you ask them a question, they shrug, and when

you give them the answer, they bang their heads.) Virchow capped this virtuoso argument by referring to the geologic abnormalities which had somehow sucked the bones four and a half feet underground and fossilized them prematurely. As funny as this sounds to us 150 years later, its hilarity did not stop it from becoming dogma that halted scientific progress for half a century. Systematic measurements of Neanderthal and related fossils were not made until after Virchow's death. When Broca tried to create a rival society in Paris, a plainclothes policeman had to be present at all times to monitor the radicals.

Why was Virchow so determined to be skeptical? It seems that he loved his laboratory and his microscope and believed that truth lived only there. All this poking about in caves by amateurs and romantics searching for the secrets of human nature seemed to Virchow a giant step backward. And in retrospect Virchow's concerns were not trivial. One of Neanderthal's most persuasive advocates, Ernst Haeckel, also had ideas about the Master Race, later taken up enthusiastically by the Third Reich. Ideas are dangerous, just like ourselves, and that is why we love them so much.

Moral: Imagine that the Neanderthal fossils are the closet skeletons you unearth in therapy and that Virchow is a most obstinate champion of their meaninglessness, and make up your own moral. We have come up with several. History takes a long time and is larger than any of us. New things are never seen straight because we can only think about them as if they were old things. Each of us is given only a small piece of the truth. The most careful of us convey that bit intact to generation after next where it can start to make sense.

[NOTE: Marginalia is an ongoing column in the Newsletter of the International Society for the Study of Dissociation (ISS). This Marginalia will be published later this year. For membership information, write or fax ISSD at 5700 Old Orchard Road, Skokie, IL 60077-1057. Fax: (708) 966-9418.]

ABSTRACTS & EXTRACTS ... from UTMB

Smith EM: Hormonal activities of cytokines.

Smith EM, Hughes TK, Cadet P & Stefano GB: Corticotropin-releasing factor-induced immunosuppression in human and invertebrate immunocytes.

Hughes TK, Smith EM, Leung MK & Stefano GB: Evidence for the conservation of an immunoreactive monokine network in invertebrates.

Opp MR & Krueger JM: Anti-interleukin 1/β reduces sleep and sleep rebound after sleep deprivation in rats.

Opp MR, Posttethwalte AE, Seyer JM & Krueger JM: Interleukin 1 receptor antagonist blocks somnogenic and pyrogenic responses to an interleukin 1 fragment

Opp MR & Krueger JM: Interleukin-1 is involved in responses to sleep deprivation in the rabbit.

Opp MR, Kapas L & Toth LA: Cytokine involvement in the regulation of sleep.

Smith EM: Hormonal activities of cytokines. Chem Immunol 1992;S2:1S4-169.

The lymphokine and cytokine field has been steadily expanding since the initial version of this chapter was written in 1987. Since then a number of new lymphokines and monokines have been

identified, so that in the nomenclature scheme, the recently described hemopoietic growth factor is interleukin-11 (IL-11). In light of this systemic naming and in the interest of simplicity, all these factors: lymphokines, monokines, interferons (IFNs), etc., will be referred to by the broader term cytokines. For a recent listing of the major cytokines produced by the immune system and their activities, see Balkwill and Burke. These have all been characterized functionally and most have been cloned and sequenced, at least at the cDNA level. A hallmark of the soluble mediators in the immune system is to be multifunctional. A trend that has become apparent and is relevant to a chapter such as this is that, with time, multiple functions have been identified for all the cytokines. Thus it should come as no surprise that these pluripotent molecules also have many systemic effects.

In such a rapidly expanding field as cytokines, it is too soon for much transfer of the newer molecules into the study of neuroendocrinimmunology. Most of the recent studies have continued with IL-1, 2, 3 and the IFNs. An anatomical fact that should be kept in mind when assessing the role of cytokines on neuroendocrine tissues is that most, if not all, endocrine glands contain a high number of lymphoid cells, up to 20% of the total cell number in the case of the adrenal gland. This, coupled with data showing that neuroendocrine tissues synthesize various cytokines, makes it very likely that endocrine tissues are routinely exposed to high concentrations of cytokines.

Smith EM, Hughes TK, Cadet P & Stefano GB: Corticotropin-releasing factor-induced immunosuppression in human and invertebrate immunocytes. Cellular and Molecular Neurobiology. 1992;12:473-481.

1. Corticotropin-releasing factor (CRF) appears to be a potentially important signal molecule in both vertebrate and invertebrate neuroimmune and autoimmunoregulatory processes. It appears to mimic the effects of α-melanocyte stimulating hormone

(MSH) but has a longer duration of action.

2. α -Helical CRF, a specific inhibitor of CRF, antagonizes CRF-induced cellular immunosuppression, but is ineffective in altering MSH-induced immunosuppression.
3. Both human and *Mytilus* immunocytes appear to have specific CRF receptors.
4. In another experiment, both CRF and MSH antagonize tumor necrosis factor stimulation of immunocytes. Again, α -helical CRF antagonizes only CRF activity, further suggesting the presence of a separate CRF receptor on these cells.

Hughes TK, Smith EM, Leung MK & Stefano GB:
Evidence for the conservation of an immunore-
active monokine network in invertebrates.
Annals of the New York Academy of Sciences
1992;650:74-80.

The observations that similar molecules are both produced by and elicit responses in the immune and neuroendocrine systems strongly suggests a linkage between the two in vertebrates. Recent studies have shown that this linkage also appears to exist in invertebrates. Most notably, several reports have demonstrated that common molecules are present in both systems of the marine bivalve mollusc, *Mytilus edulis*. For example, *Mytilus* hemocytes and human granulocytes demonstrate similar conformational changes and locomotory responses following exposure to opioid peptides and also appear to produce an immunoreactive (ir) [Met] enkephalin. The hemocytes of *Mytilus* exhibit similarities to cells of the vertebrate monocyte/macrophage lineage. For example, they are motile, phagocytic and contain myeloperoxidase. Additionally, when a nerve is severed, *Mytilus* evokes an immune-like response demonstrated by migration of hemocytes into the lesioned area. Considering the similarities of *Mytilus* hemocytes and human monocytes we determined whether a monokine-like network might be operating in these invertebrates. We have found that *Mytilus* hemocytes respond to human monokines, interleukin-1 (IL-1) and tumor necrosis factor-alpha (TNF), contain immunoreactively similar substances and interact in a way that is similar to the vertebrate system.

Opp MR & Krueger JM: Anti-interleukin-1 β reduces sleep and sleep rebound after sleep deprivation in rats. Am J Physiol 1994;35:R688-R695.

Interleukin-1 (IL-1) is somnogenic and is hypothesized to be involved in physiological sleep regulation. Antibodies directed against rat IL-1 β were used to further elucidate possible contributions of IL-1 to sleep regulation. Rabbit anti-rat IL-1 β (anti-rat IL-1 β) was injected intracerebroventricularly into normal rats 15 min before light onset. A 20- μ g dose of anti-IL-1 β reduced non-rapid-eye-movement (NREM) sleep by 60 min during the subsequent 12-h light period. There was no effect on rapid eye movement sleep after this dose of anti-IL-1 β . The effects of anti-IL-1 β on the enhancement of sleep after periods of sleep deprivation were also determined. When rats were deprived of sleep for 3-h beginning at light onset, the amount of time spent in NREM sleep increased for the remaining 9-h of the light period, regardless of whether control intracerebroventricular injections of pyrogen-free saline or rabbit immunoglobulin G were given during the deprivation period. However, when 20 μ g anti-IL-1 β were injected intracerebroventricularly during the sleep deprivation period, the expected NREM sleep rebound was completely blocked. Collectively, these data provide additional support for the hypothesis that IL-1 is involved in regulation of physiological sleep-wake activity.

Opp MR, Postlethwaite AE, Seyer JM & Krueger JM: interleukin 1 receptor antagonist blocks somnogenic and pyrogenic responses to an interleukin 1 fragment. Proc Natl Acad Sci USA 1992;89:3726-3730.

Previously it was shown that human interleukin 1 (hIL-1) and a hIL-1 fragment, hIL-1 β 208-240 and rat (rt) IL-1 β 208-240 were active in their respective species. Furthermore, it was unknown whether these fragments elicited their effects via the IL-1 receptors. Two doses of rIL-1 β 208-240 (6.0 and 12.0 nmol) were intracerebroventricularly administered to rabbits. The 6.0-nmol dose had little effect, whereas the 12.0-nmol dose greatly increased non-rapid-eye-movement sleep across a 6-hr recording period and

induced a febrile response. Rats injected intracerebroventricularly with rIL-1 β 208-240 at dark onset responded to three doses of the peptide (1.2, 2.4, and 4.8 nmol). The 1.2-nmol dose did not greatly affect sleep but did induce a moderate febrile response. The 2.4- and 4.8-nmol doses increased non-rapid-eye-movement sleep across the 12-hr recording period. Maximal brain temperature elevations relative to controls after the 2.4- and 4.8-nmol doses of the peptide were $0.9 \pm 0.2^\circ\text{C}$, respectively. These responses in both rabbits and rats were completely blocked or significantly attenuated when the animals were pretreated with an IL-1 receptor antagonist. These results suggest that the biological activities of IL-1 β 208-240 are mediated via the IL-1 β receptors.

Opp MR, Krueger JM: Interleukin-1 is involved in responses to sleep deprivation in the rabbit. Brain Research 1994;639:57-65.

Interleukin-1 (IL-1) is hypothesized to be involved in sleep regulation. Antibodies directed against interleukin-1 β were injected intracerebroventricularly (ICV) into normal rabbits to determine the effects of the reduction of endogenous IL-1 β on spontaneous sleep/wake behavior. A 100 μg dose of anti-IL-1 β reduced non-rapid eye movement sleep (NREMS) by about 20-min during the first 4-h post injection without affecting REMS, amplitudes of electroencephalographic (EEG) slow waves, or brain temperature. Plasma concentrations of IL-1 β , as determined by radioimmunoassay, were detectable in 39 of 79 (49%) blood samples taken before and after 4-h total sleep deprivation (SD). Plasma concentrations of IL-1 β were, on average, significantly elevated following SD. This rebound in both parameters was exaggerated if rabbits received vehicle or anti-IL-1 β in conjunction with SD. However, ICV administration of anti-IL-1 β at the beginning or end of the SD period attenuated, relative to

values obtained after administration of vehicle, the NREMS rebound following SD. It is concluded that SD alters the responsiveness of rabbits to experimental manipulation and that responses to SD in the rabbit are mediated, in part, by IL-1.

Opp MR, Kapas L & Toth LA: Cytokine involvement in the regulation of sleep. PSEBM 1992;201:16-27.

The term cytokine refers to a group of regulatory proteins that are produced by a large number of cell types in response to a variety of stimuli, and include substances such as the interleukins (IL), tumor necrosis factor (TNF), and interferons (IFN). Cytokines are key mediators of many of the physiological responses to infection or trauma, and these responses are collectively referred to as the acute phase response (APR). The role of cytokines in the complex physiological changes of the APR has been extensively reviewed elsewhere. The behavioral changes associated with the APR include altered vigilance. This Minireview examines cytokine-induced changes in vigilance and the hypothesized mechanisms whereby these cytokines are likely to contribute to altered sleep during microbial disease.

Conclusions:

Sleep can clearly be modulated by exogenous administration of cytokines, and is also likely to be regulated, in part, by endogenous cytokines. The synthesis of small peptide fragments from cytokines and the development of specific receptor antagonists and antibodies provide promising new tools with which to further examine the mechanisms responsible for cytokine-induced changes in vigilance. Although the mechanisms and sites of action mediating these somnogenic properties are not yet fully elucidated, the somnogenic responses to microbial challenge may represent amplifications of normal, physiological processes.

Gentle reminder #2: Don't forget to mail in your 1995 subscription dues!

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Cover page

¹ Bernardi G: Foreword: Genome structure and evolution. Journal of Molecular Evolution 1991 ;33:3.

Glantz: Review ... p 5

¹ Maryanski A & Turner J: The Social Cage: Human Nature and the Evolution of Society. Stanford: Stanford University Press, 1992.

² Masters R: Book review on Rousseau JJ: Discourse on Inequality and Marx K & Engel F: German Ideology In Ethology and Sociobiology 1994;15:p2.

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

⁴ Bernhard G & Glantz K: Staying Human in the Organization. Praeger: Westport CT, 1991.

Waller: King Solomon ... p 7

¹ Price J: The dominance hierarchy and the evolution of mental illness. The Lancet 1967;2:234-246.

Price: Westermarck ... p 9

¹ Westermarck E: The History of Human Marriage. Vols 1-3. London: Macmillan, 1891. Quotation from 5th edition, 1925, vol 2, p 192-3.

² Erickson MT: Rethinking Oedipus: an evolutionary perspective of incest avoidance. Am J Psychiatry 1993;150:411-416.

³ Erickson MT: Rethinking Oedipus. Am J Psychiatry 1994;151:297-8.

⁴ Baudry FD: Problems in the application of psychoanalysis to Mary Shelley's Frankenstein. International Journal of Psychoanalytic Psychotherapy 1982/3;9:647-656.

⁵ Shelley M: Frankenstein London, 1818.

⁶ Myers WA: Mary Shelley's Frankenstein: Creativity and the psychology of the exception. International Journal of Psychoanalytic Psychotherapy 1982/3;9:625-645.

⁷ Bennet BT (ed): The Letters of Mary Wollstonecraft Shelley. Volume 1: A Part of the Elect. Baltimore: The Johns Hopkins University Press, 1980.

⁸ Feldman PR & Scott-Kilvert D (eds): The Journals of Mary Shelley. 1814-1844. Vol 1:1814-1822. Oxford: Clarendon Press, 1987.

⁸ In the context of this sympathetic, and, indeed, astute paternal reaction to the appearance of melancholy in a child, it is poignant that when she was later attacked by melancholy herself, following the death of her infant son, Mary Shelley's father wrote to her:

"...do not put the miserable delusion on yourself, to think there is something tine, and beautiful, and delicate, in giving yourself up, and agreeing to be nothing. Remember too, though at first your nearest connections may pity you in this state, yet that when they see you fixed in selfishness and HI humour, and regardless of the happiness of everyone else, they will finally cease to love you, and scarcely learn to endure you...."

⁹ This change was made in response to editorial pressure, which shows that the editor was concerned about the incestuous aspect of the relationship between Victor and Elizabeth, ostensibly not because they were reared in the same household, but because they were cousins.⁵ Accusations of incest had been made against the Byron/Shelley party staying on Lake Geneva in 1816, when Frankenstein was commenced.

Some years later, in August 1821, Shelley wrote to the Countess Guiccioli: *"The natives of Geneva and the English people who were living there did not hesitate to affirm that we were leading a life of the most unbridled libertinism. They said that we had formed a pact to outrage all that is regarded as most sacred in human society. Allow me, Madam, to spare you the details. I will only tell you that atheism, incest, and many other things - sometimes ridiculous and sometimes terrible - were imputed to us. The English papers old not delay to spread the scandal, and the people believed it."*^{7, p 125} It is not quite clear between which members of the party the incest was supposed to have taken place. The only related members were Mary Shelley (then Mary Wollstonecraft) and her step-sister Claire Clairmont. Her step-brother Charles Clairmont did not visit them in Switzerland, although he was later a frequent visitor in England and Italy.³

¹⁰ Quennell P: The Desire to Please. London: Weidenfeld and Nicolson, 1982, p 35.

Gardner: TASS ... p 14

¹ Professor Salzen's Aberdeen, Scotland, postal code is AB9 2UB.

Goodwin & Attias: Marginalia ... p 16

¹ Trinkaus E & Shipman P: The Neandertals. Vintage, 1994.

² One was Julian, an ethologist and the youthful chairman of biology at what is now Rice University, Houston TX, USA, and one of the originators of the "new synthesis" between Darwinian evolution and Mendelian genetics.