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ADULT ATTACHMENT MODELS AND QUALITY OF THE MOTHER-CHILD RELATIONSHIP

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This study explored relationships between mothers' internal working models of attachment and child-maternal behavior patterns during a free-play situation at home. The sample consisted of 42 eight-year-olds and their mothers. Adult Attachment Status was assessed by Main's Adult Attachment Interview (AAI). The mother-child interactions were videotaped at home and coded by means of an ethological coding manual. The mothers' attachment categories were related to relationship quality variables such as teaching and supportive behaviour, frequency of controls, disconfirmation of the interactant, both by child and mother compliance to requests. Results reveal differences in child-mother behaviour which are related to mothers' internal working models. (*Development*)

WALKING FAST-RANKING HIGH: AN OBSERVATIONAL STUDY OF PEDESTRIANS

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Bornstein and Bornstein (1976) showed that walking speed is positively correlated with city size. Since Levine, Lynch, Miyake & Lucia (1989) added a positive correlation with coronary heart disease, walking speed has become an important indicator for the pace of life. However, little data exist on the influence of urban environmental factors (e.g. pedestrian flow and traffic flow) and personal factors (age and status), although they may play an important role in determining pace. Socio-economic status of males is one of the most important mate choice criteria of females (Buss, 1989), leading to greater male competition. We postulated that status-seeking may be visible in elementary behaviour like walking, and thus predicted a positive correlation between status and walking speed in males, and no correlation in females. Walking speed, pedestrian flows and traffic flows were measured. Afterwards, the observed pedestrians were questioned about their age, body height, education, profession and income. Walking speed was correlated with traffic flows, but not with pedestrian flows. High ranking males walked faster than low ranking males, whereas the pace of females was independent of status. Thus, walking speed seems to express socio-economic status in males, but not in females. (*Contemporary Environments*)

CRIMINALITY, ATTACHMENT, AND SIBLING CONSANGUINITY

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Interviews with male felons suggested a pattern of poor-quality relationship with the mother, as proposed by Bowlby. To test for an association between quality of attachment and later criminality, the retrospective Adult Attachment Scale was given to 135 felons. Anxious attachment predicted more felony convictions, and was also associated with maternal punitiveness, as has been found for young children. Other research has found that maternal punitiveness predicts delinquency, as well as predicting briefer adult romantic relationships. Criminality and brief romances were associated with paternal neglect as well. Lastly, criminality was related to having half-sibs (45% of the sample) and stepsibs (35%), family patterns characterized by maternal punitiveness and paternal inattentiveness. Inter-generational perpetuation of criminality may be fostered by weak affective family relations, aggravated by low sibling consanguinity. Brevity of romances, coupled with multiple romances will lead to low consanguinity among sibs. This may intensify competition among sibs leading to frequent punishment by the mother. Paternal neglect may also be fostered by low consanguinity of sibs. Aside from paternity uncertainty effects, fathers may abandon or neglect children with competing stepsibs, especially once they have been displaced from the home by another man; cf. male infanticide of other males' offspring. Similarly, the mother may favour children of her current lover over those by other men, thereby placing those children at a disadvantage. These displaced men may redirect their reproductive effort toward courtship of other women or care of their sisters' children. (*Development*)

FAMILY LIVING ARRANGEMENTS AND MARITAL SATISFACTION IN COUPLES WITH YOUNG ADULT CHILDREN

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Over the past decade, increasing numbers of young adults have remained or returned to their parent's homes, impeding the middle aged couple's transition to the empty nest. Typically, couples look forward to the empty nest stage, expecting increased opportunities to renew their relationship and freedom to explore individual and mutual interests. Coresidence of middle aged parents and their young adult children in the "crowded nest" is viewed by parents as a nonnormative, off-time event.

The presence of young adult children in the home is thought to impede the marital pair's ability to focus on their relationship and themselves. Problems with differing lifestyles, privacy, and unclear division of labour can interfere with the couple's major developmental task of reinvestment in their relationship. Marital satisfaction levels of these couples are likely to be lower than empty nest couples.

This study examined the differences in levels of marital satisfaction between thirty empty nest and thirty crowded nest couples, and the variables influencing marital satisfaction of crowded nest couples. The Marriage Questionnaire (Russell & Wells, 1986) was the instrument used to measure marital satisfaction. To control for the influence of menopausal status on the wives' satisfaction, the Attitude Toward Menopause Scale (Neugarten, Wood, Kraines & Loomis, 1963) and the Menopause Symptom Checklist (Neugarten & Kraines, 1965) were administered.

Marital satisfaction of the two groups will be discussed as well as the interaction effects of underlying physiological factors. (*Contemporary Environments*)

SMILING DURING MOTHER-INFANT INTERACTION IN NORMAL AND DOWN SYNDROME INFANTS

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The aim of this study was to examine smiling during mother-infant interactions in 3 to 13-month-old normal and Down syndrome infants. Fifteen normal and fifteen Down syndrome infants and their mothers were videotaped at home. After a 10-minute episode of naturalistic face-to-face interactions, a subsequent 1-minute still-face situation occurred, with mothers silently maintaining an impassive face. Results indicated that all infants and their mothers were able to coordinate their behaviours. On the one hand, the infant's smile preceded the onset of the mother's smile. In 11 to 13-month-olds normal infants, though not in the case of Down syndrome infants, the probability of mothers smiling before infants increased. On the other hand, when maternal behaviour changed (naturalistic vs. still-face episodes), smiling in Down syndrome infants followed a similar pattern to that of normal infants. These findings emphasize the communicative function of smiling during face-to-face interactions, lending support to the universality of facial expressions. In any case, variations observed in normal infants' responses toward the end of their first year lead us to consider the influence of socialization on facial expression development. (*Poster Presentation*)

HIERARCHICAL CHALLENGE, INVOLUNTARY SUBORDINATE STRATEGY, AND ADOLESCENT ATTACHMENT TO PARENTS: A HYPOTHETICAL MODEL OF ONE PATH TO ADOLESCENT DEPRESSION Cathron L. Hilburn Cobb

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A model of an evolved submissive sub-routine of agonistic behaviour, triggered by inevitable defeat in up-hierarchical challenge, has been proposed by Sloman, Price, Gilbert and Gardner. This phenomenon is referred to as the Involuntary Subordinate Strategy (ISS). The present paper recasts the ISS as an additional behavioural system within Bowlby's theory of evolutionary-ethological control systems. The manner in which this system interacts with individual differences in the operation of the attachment behavioural system is employed to hypothesize differing outcomes for adolescent-parent challenges. It is proposed that parents who practice an "authoritative" style of discipline (allowing for negotiation) will foster adaptive acceptance on the part of a challenging adolescent, more quickly deactivating the negative consequences of the ISS, and avoiding depression. Depending on the state of adolescent-parent attachment security, the outcome may produce more or less frequently renewed challenges (episodic turmoil). On the other hand, parents who practice an "authoritarian" discipline (non-negotiable) run the risk of inciting heightened resentment over defeat, motivating compulsive but less competent challenges, ultimately ending in immature compliance (if attachments have been secure) or depression (if attachments have been insecure). Data from self-report questionnaires completed by adolescents and their parents (the FAM III Dyadic Relationship Scale) suggests support for this formulation. (*Psychiatry*)

STUDYING THE EVOLUTIONARY SIGNIFICANCE OF BEHAVIOUR: MODELS, MECHANISMS, AND ECOLOGICAL VALIDITY

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The evolutionary significance of behaviour is concerned with (1) the stresses that existed in ancestral environments, (2) the proximate mechanisms that evolved to deal with those stresses and (3) the way those evolved mechanisms function in the current environment. Because the Environment of Evolutionary Adaptedness for humans may differ considerably from the current environment, evolved proximate mechanisms may produce modern behaviours that differ considerably from ancestral behaviours. Moreover, because of the diversity of modern cultures, evolved proximate mechanisms may produce different behaviours in different contemporary cultures. I argue that the study of the evolutionary significance of behaviours requires (1) quantitative models of ancestral selection pressures to determine if a putative adaptation could ever have contributed to fitness, (2) the experimental study of proximate mechanisms to characterize the nature of the proximate mechanisms, and (3) cross-cultural studies to determine how the mechanisms function in different current environments. (*Contemporary Environments*)

PSYCHOANALYTIC VIEW OF THE INVOLUNTARY SUBORDINATE STRATEGY

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From a modern psychoanalytic view, I will consider how an earlier evolved capacity to negotiate hierarchy may have shaped relationship capacities that evolved more recently with the lengthening of childhood dependency. The continuing operation of hierarchy sensitive mechanism in a prolonged parent/child relationship may contribute to some of the neurotic compromises that interfere with subsequent functioning. The "transference" or relationship models that one can develop in such circumstances may not equip one well for extra family functioning. (*Psychiatry*)

FEMININE MANNERISMS AND PROXIMATE MECHANISMS OF FEMALE CHOICE

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Evolutionary theory predicts that the sex that invests the most in offsprings should have the most influence in mate choice. The smaller sexually dimorphic human female can obviously not exert this choice by force, nor can she afford to lure desirable males by displaying non-discriminating, fixed signs of sexual receptivity. In contrast, behaviourally coded signals of sexual receptivity can be more discriminating in which male-borne stimuli evoke their expression. Why shouldn't natural selection cause their spontaneous expression in proportion to the amount of fitness-maximizing male-borne releasing stimuli present? If such female signals released male sexual behaviour in proportion to the frequency or intensity of their expression, they could function as proximate mechanisms of female choice. Feminine mannerisms, defined as behaviours which occur in both sexes, but more frequently in females, may function as behaviour coded in female courtship signals, as well as releasers of male sexual behaviour. Heterosexual women's brains should be organized to easily express these behaviours and heterosexual men's brains should be organized to be attracted to them. Data collected to date bearing on these propositions will be presented. (*Gender Signals*)

ATTACHMENT

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Internal Working Models (IWM) are the subjective side of "imprinting". Discussion of phylogeny and the scientific study of subjective states. Imprinting and the speciation process.

2. Zero to six years: Traditional, external evidence that this a critical or sensitive period in humans for establishment of IWMs.

3. Descriptions from couple's therapy: Subjective accounts of IWMs developed in early childhood and

how they intersect in love and marriage.

4. Within-culture consistencies in IWMs. Q-sort and Adult Attachment Interview data from Iceland, India and China. Is the process leading to cultural proliferation indistinguishable from the process leading to speciation?

5. Evolutionary theory, speciation and early attachments: Sewall Wright's model of competing small populations vs. Fisher's model of individual selection. Evidence that neither is exclusive. (*Special Address*)

DIFFERENCES IN INFANT CRY AND OTHER BEHAVIOURS ACROSS FOUR LEVELS OF PAIN

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As part of a project to improve infant pain assessment, infant behaviours across 4 levels of pain (LOP) in 0-12 month-old infants were compared.

A 16-cell matrix of 88 infants comprising 4 assessed LOP (severe, moderate, mild and none) for each of 4 age categories (0-3 mo., 4-6 mo., 7-9 mo. and 10-12 mo.) was studied. Infants were assigned to cells depending upon age and pain assessments performed by 5 pediatric nurse experts who viewed a 3-4 minute videotape of the infant and notes from the infant's medical chart. Infants were included in the matrix if 4 or more nurses agreed on the LOP. Parents signed an informed consent prior to videotaping. Cry pitch, perturbations, tenseness and noisiness were measured. Facial behaviours were coded by both FACS and MAX systems. Other behaviours were coded with The Observer. Inter- and intracoder reliability was maintained at $\geq .90$. Cry measures and durations of facial and body behaviours were compared across LOP using ANOVA.

For all infants combined, those with more pain exhibited: (1) more MAX blends of pain+anger, generally broadcast cries, cry tenseness, crying during sleep or around a pacifier, square-angular mouth, cheeks elevated+eyes closed, funnel tongue and chin quivering; and (2) less alert+quiet states, leg and elbow flexing. Age affected the influence of pain on infant behaviour. Several cry measures and facial behaviours that increased with greater pain in younger infants, decreased in older infants. The significance of this will be discussed. Some promising pain assessment behaviours are cry orientation and leg flexing for 4-12 month olds and facial expressions and cry perturbations and tenseness for 0-3 month olds. (*Development*)

ADAPTIVE AND MALADAPTIVE FORMS OF HUMAN ALPHA STATES

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Even a low key leader may exhibit alpha behaviour, defined by initiative, humour, gregariousness, painfulness, good spirits, and feelings of autonomy. People seen clinically who exhibit involuntary subordination strategies (ISS) are in effect following the past or present lead of others, and lack alpha communications. With treatment, patients may exhibit increasing leadership.

Treatment aims to free the person to be a winner, assisted by the many ways that people compared to other animals can be in charge (e.g., the many social settings any one person can occupy, multiple option future scenarios with numerous possible changes). Therapy may include assessment of reality with voluntary subordination if a battle can't be won: voluntarily giving way may nevertheless represent victory for the patient, as over him/herself or the situation, and alpha behaviours may result. Victory may also result if the conflict can be won, or when there are no present or real opponents.

Case example: AU was abused by a stepfather (after loss of her father when age 5); she was under the domination of this person and then her husband. Individual psychotherapy helped her learn of her involuntary subordination (with depression, anxiety and obsessive-compulsive symptoms). Medication and group psychotherapy helped. She divorced the dominating husband and reacted to his provocations in a less subordinate manner and without anxiety. She gained control over "trancing out" by more consciously re-experiencing her trauma. In her work, peer-group, and family she is more appropriately in charge (or part of fellowship). (*Psychiatry*)

NON-VERBAL BEHAVIOUR OF DEPRESSED PATIENTS AND AN INTERVIEWER DURING A CLINICAL INTERVIEW BEFORE TREATMENT IS RELATED TO THE PATIENTS' RESPONSES TO TREATMENT

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Interpersonal theories on depression state that the interaction between depression-prone subjects and their social environment plays a causal role in the development and course of depression. Sixty-five percent of human communication is assumed to be non-verbal. We investigated observable aspects of interactions between 24 depressed patients (winter-depressed) and their medical attendant ($n=2$) during a clinical interview prior to treatment. The interviews were videotaped. For the first 15 minutes of the interview, observable behaviour of the patients and the interviewers were analyzed by means of ethological methods. On the basis of statistical criteria, different elements of registered behaviour were clustered into behavioural factors. Results revealed that 5 of 6 patients' factors predicted the patients' treatment-responses (forward regression analysis: adj. $R^2=.30$, $p=0.04$, $n=23$). In addition, 4 of the 7 interviewer factors predicted the treatment-response (adj. $R^2=0.26$, $p=0.04$, $n=2$). Patients' and interviewers' response-related factors were interrelated. In another group of 31 (non-seasonal) depressed patients, we investigated the course of the patients' and interviewer's behavioural factors during the interview. During the first 4 minutes of the interview, the 3-way interrelationship between 1) patients' behaviour, 2) interviewer's behaviour, and 3) the patients' responses to treatment was established. Results showed that interpersonal behaviour, assessed before treatment, is related to the treatment-response in depression. Moreover, this relationship is established early in the interaction. Results support an interpersonal approach of depression. (*Psychiatry*)

MATCHING OF NON-VERBAL BEHAVIOUR OF SEVERELY DEPRESSED PATIENTS AND A PSYCHIATRIST DURING A CLINICAL INTERVIEW, PRIOR TO TREATMENT, PREDICTS TREATMENT-RESPONSE

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Interpersonal behaviour is assumed to be causally related to the development and maintenance of depression (Coyne, Burchill & Stiles, 1990). About 60% of human communication is assumed to be non-verbal (Burgoon, 1985). In previous studies on depressed patients, non-verbal interpersonal behaviour of depressed patients prior to treatment, predicted treatment response (Bouhuys & Van den Hoofdakker, 1993; Geerts, Bouhuys, Meesters & Jansen, 1993; Troisi, Pasini, Bersani, Grispini & Ciani, 1989). Both patients' and interviewers' behaviours were shown to have this predictive quality. In addition, treatment-predicting behaviours of patients and interviewers were interrelated (Bouhuys & Van den Hoofdakker; Geerts et al.). This relationship may reflect matching processes (equalizing durations or frequencies of behaviours). Whether matching between patients and their interviewer is related to treatment-response is explored.

The temporal pattern of matching during a dyadic interaction of 20 minutes between 31 depressed patients and a psychiatrist was studied per 4 minute period. Two interrelated response-predicting behavioural factors were studied: The patients' "Speaking Effort" (duration or frequency of gesticulating and looking at the psychiatrist during speech) and the psychiatrist's "Encouragement" (yes-nodding during listening). Matching was defined as a constant minus the absolute difference between these two factors (high scores reflect high levels of matching).

Matching decreased in the course of the pre-treatment interview with patients who did not improve, whereas it tended to increase (improvement \times time, $p=.009$) with patients who improved. Results show that the temporal organization of interpersonal behaviour is related to treatment-response in depression. (*Poster Presentation*)

MEASURING ENVIRONMENTAL/BIOLOGICAL ATTRIBUTION: A FUNDAMENTAL DIMENSION?

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Explanations for behaviours that emphasize the importance of biological or environmental factors have been a major theme in psychological discourse, yet they have not been adequately explored as attributional styles with distinct correlates. The present 2 studies examined this dimension of attribution through the development and validation of an Environmental/ Biological Attribution Scale (EBAS). The framework guiding the various stages of the project was based on Jackson's (1970) sequential method of scale construction. A total of 602 Canadian university students took part in the research project. Research confirmed 4 hypotheses: Biologically-oriented attributional styles were correlated with the same styles as measured by an alternate form ($r=.76$), with authoritarianism ($r=.25$), and with racism

($r=.15$). Environmentally-oriented attributional styles were correlated with attributions concerning the importance of strength of will ($r=.39$). Results support the position that environmental and biological attributional styles represent lenses having implications for the manner in which we evaluate other peoples' actions. (*Poster Presentation*)

MASTOPHILIA: THEORIES AND DATA

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Across cultures and throughout history, men have been fascinated by women's breasts. This consistency strongly suggests a genetic basis for male mastophilia. Various explanations have been advanced to account for this phenomenon, but the most obvious explanations of mastophilia have serious flaws. The genital echo hypothesis advanced by zoologist Desmond Morris is currently one of the most widely accepted explanations. The key idea in this hypothesis is that what men are really interested in looking at is women's buttocks, and that men are also interested in looking at breasts because of a morphological similarity between breasts and buttocks. Data in the present study seem to contradict this idea. College men showed a particular interest in the least buttock-like portions of women's breasts. Also, their interest was not confined to mere visual inspection. Other findings cast additional doubt on the genital echo hypothesis. Finally, a basic problem with current theories of mastophilia is identified, and a new hypothesis is proposed. (*Gender Signals*)

AN EVOLUTIONARY THEORY OF MISAPPREHENSION: BODY TALK BETWEEN STRANGERS OF THE OPPOSITE SEX

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Biological theories predict that the closer a behaviour is to reproductive success, the more strictly it is organized. One would therefore expect to find signals which are stereotyped, discrete and strictly organized in human-courtship. Recent research has shown that this is not the case. Signals which can be denoted as courtship signals based on their frequencies and consequences occur in a variety of contexts. Moreover, some signals are even shown when there is no interest in a potential partner. There is no clear stereotyped repertoire of human-courtship signals, contradicting the biological hypothesis.

In addition, asymmetric investment in offspring would predict that there are sex-specific signalling strategies. Females have to elicit and control male self-presentation in order to assess male status and investment tendencies and the probability of male deception. Thus one would expect males to be expert decoders of female signals, yet the literature on this point indicates that males are bad decoders of female signals. The reason for this contradiction has not yet been tackled by research. One cause of the contradiction could be that such a communicative system can easily be used for manipulation and deception outside as well as within courtship situations. As males under male-male competition they can not ignore female signals. Hence they are still prone to female deception, and an arms race in signalling between female senders and male decoders naturally occurs, in which females become better senders and males become better decoders. This arms race leads to the disappearance of overt courtship repertoire and there is a shift from meaning based on content to meaning based on quality of the signals. If interest can be communicated via quality changes, every body-movement can become a signal.

In order to analyze the quality of signalling a new approach to the analysis of human nonverbal communication has been developed. With the program for digital image processing (ALYSIS) in the lab we have been able to analyze two data-sets of opposite sex strangers meeting for the first time videotaped in Germany and Japan. The analysis shows that speed, emphasis and expressiveness of movements change considerably when a person shows interest in a person of the opposite sex. Although there are repertoire differences between cultures, the qualitative changes remain the same. Results are independent of the signals content. The war of signals thus has atomized human courtship repertoire into small units of move.

This is the starting point for a new theory of how meaning is generated in human nonverbal communication. It will underline human communication as a complex process where competing signalling systems are involved and meaning arises in a probabilistic way through emergence. (*Featured Address*)

TRANSCULTURAL RESPONSES TO AESTHETIC EXPERIENCE: AN ETHOLOGICAL APPROACH

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This paper will explore aesthetic responses to works of art among cultures from an ethological perspective. In contrast to current multi-cultural perspectives supporting the tenet of "separate but equal", this presentation considers that it is by acknowledging those forces which bind us as a common species that we can come to appreciate our differences.

Ethology explores the innate templates which guide sensory experiences which maximize our adaptations to the environment. During an aesthetic experience, these templates are given form through the artmaking or art appreciation process. They can be observed as manifestations of attachment behaviour (Bowlby), motivational ambivalence (Tinbergen), damming/discharge phenomenon (Lorenz) and in play or exploratory behaviour (Morris). As the building blocks of behaviour "made special" (Dissanayake), the universal desire to transform the afore-mentioned dynamics into a realm different from the everyday becomes an alternative reality where the senses and desires become shaped, ritualized and symbolized. As a developmental phenomenon, the aesthetic experience often entails transitional phenomena (Winnicott) and super-normal phenomena (Lorenz) which may constitute the evolutionary forerunners of archetypes, giving particular style to basic instinct. The capacity to symbolize "biologically significant form" as Gombrich terms it, begins with play and exploratory behaviour, then evolves into sophisticated investigation/reward dynamics (Morris) which must overcome intense approach-avoidant reactions to the aesthetic stimulus.

To illustrate these dynamics, a range of multinational patrons were observed interacting with a monumental sculpture by Jean Dubuffet. As a form of psychological territory, Dubuffet activates a range of responses analogous to those displayed by many species of animals. That does not suggest that all aesthetic responses are biologically determined, nor does it undermine the power of a free will to apply one's cultural orientation to appreciate a work of art. However, ethologically-based observations provide a firm footing upon which one can begin to layer cultural variations to aesthetic experience and thus begin to appreciate the full dimensions of the artist and his/her work. (*Contemporary Environments*)

COGNITIVE AND PERCEPTUAL BIASES OF SOCIAL EXCHANGE: ARE INDIVIDUALS SELFISH?

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From an evolutionary perspective, our psyche is a product of natural selection, a process that favours genetic selfishness. Two possible means of expressing genetic selfishness are through selfish behaviour or selfish perceptions regulating behaviour. In two studies, the existence of selfish biases in the perception of social exchanges were explored. Two possible types of selfish biases were proposed: one type causing the individual to consider positive outcomes for the self as more important than positive outcomes for others, and another, causing the individual to underestimate the value and amount given to others, thereby facilitating subtle cheating. Subjects were reported actual instances of exchange, including items given and received. Evidence of reciprocal altruism was found. Some findings were contrary to expectations. A re-evaluation of the forms that selfishness may assume in social exchange is presented. (*Poster Presentation*)

THE EVOLUTIONARY ROOTS OF PATRIOTISM

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Patriotism is a pervasive phenomenon with which all of us are personally familiar. In the language of everyday life, patriotism is love and loyalty towards one's country; in the language of evolutionary science, patriotism is a predisposition to behave altruistically on behalf of the most comprehensive social system of which an individual is a member. Viewed from this perspective, patriotism is neither an exclusively human nor a relatively recent phenomenon. On the contrary, this perspective suggests that patriotism is an ancient and pervasive natural phenomenon that appears across the levels of life's hierarchy and in social species other than humans. Social systems manufacture patriotism by attaching their members' individual-level capacities for nepotism or reciprocal altruism, or both, to the system as a whole. This appears to be achieved in human societies through orchestrated manipulation of 1) kin recognition mechanisms, 2) symbols of reciprocity, 3) symbols associated with important collective goods, and 4) symbols associated with the collective entities through which these collective goods are achieved. If this analysis is correct, we can make sense of the complex socialization processes and familiar symbols (flags, anthems, monuments, holidays, etc.) that prepare humans for altruistic sacrifice

on behalf of their societies. These processes appear to have been used universally to build the alliances through which humans have pursued their shared interests. However, in a world threatened by overpopulation, resource depletion, environmental destruction, and potentially cataclysmic warfare, the brand of patriotism that served the interests of our ancestors might today contribute to human extinction. We may be tempted to conclude, on this basis, that patriotism must be eliminated. However, this will not be possible. Based as it is on the most elementary and powerful human social predispositions, and given that it helps groups of humans advance their interests, patriotism will be generated naturally and inexorably in human societies. Our hope, instead, lies in using these ancient mechanisms to build a more comprehensive social and political system, a system that will allow our species to survive in an age that differs so dramatically from the age when these mechanisms originally evolved. (*Special Address*)

BEHAVIOUR AS THE BIOLOGICAL SPECIALIZATION OF HOMO SAPIENS

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The adaptive system of all living beings can be divided into three groups according to the temporal characteristics of environmental factors. These include morphological adaptations to stable factors, such as gravity; physiological adaptations to cycling factors, such as seasons and circadian rhythms, and behavioural adaptations to unpredictable, transient factors.

Although morphological and functional adaptations are necessary components of the adaptive system of all species, behavioural adaptations are not. In various species, behaviour, to various degrees of complexity, has been a mode of adaptation to the environment. Though some species have behavioural adaptations considered unimportant, other species' adaptations are essential for survival. Homo Sapiens fall in the latter category.

Behaviour, as a form of biological adaptation, is the subject of ethology despite human behaviour's complicated psychological and sociological characteristics. Human culture, analogous to the different behavioural patterns of other social species, determined the variations of behavioural adaptations. Cross-cultural investigation as an ethological method may result in the appreciation of a common biological basis of human behaviour, leading to an avoidance of ethnic conflicts. (*Contemporary Environments*)

THE NATURE OF ETHNOCENTRISM, NATIONALISM AND XENOPHOBIA

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Xenophobic nationalism needs to be reexamined from the perspective of human ethology and neuroscience. Ethnocentrism, in the form of preference for behaviours encountered in the environment of infancy, seems to be a cultural universal that springs from the shaping of sense perception during normal child development. Because large-scale societies need to overcome a natural tendency for ingroup cooperation and hostility to outsiders, the integration of diverse ethnic, cultural or religious groups is reinforced by the symbolic association of the nation with a fictive kin-group and an optimistic view of the rewards of future social interaction. Xenophobia arises when fear or uncertainty about the future undermines this optimism, eroding the learned respect for those who differ from us. An evolutionary approach to ethnocentrism, nationalism and xenophobia thus confirms the traditional view that education plays a central role in the preservation of civilization. (*Politics*)

ENVIRONMENTAL CONTINGENCIES AND PHYSIOLOGICAL CHANGE

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While person-other or animal-animal separateness is a biological fact, research findings over the past decade have clearly established that others' behaviour and communications have physiological effects on person/animals that encode such information, that these effects have a variety of important consequences, including alterations in how an encoder organizes, prioritizes and responds to subsequent information, learning, the probability of subsequent behaviour, and so forth. The effects of others' communications are particularly striking among members of primate social hierarchies. However, they

can also be demonstrated in a variety of other types of interactions. Data also suggest that individuals seek out specific social environments that alter their physiological states in desired ways. Key findings using observational, physiological, and brain scanning techniques are reviewed as are their implications for theories of behaviour pertinent to ethology, evolutionary theory and disordered behaviour. (*Featured Address*)

QUESTIONS REGARDING THE INVOLUNTARY SUBORDINATE STRATEGY HYPOTHESIS OF DEPRESSION

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The involuntary subordinate strategy hypothesis of depression argues that depression is a biological genetically preprogrammed response pattern that is elicited by losing a hierarchical encounter or by loss of a loved one. The hypothesis raises a variety of interesting questions, several of which will be addressed:

1. The suggestion that the response is genetically preprogrammed implies that it has evolved, that it has at some previously time been selected, and that it has/does confer an adaptive advantage. In time-limited, uncertain outcome situations, the involuntary subordinate strategy appears to be adaptive. Its application to depression necessitates making a distinction between its possible adaptive advantage in a particular social interaction and the possibility that it is used maladaptively. Data from studies of dysthymic disorder patients suggest both possibilities as well as a sequential relationship: initially, the response appears adaptive in that it diminishes others' aggressive- controlling behaviour, at times even evokes empathy and reconciliation; continued use of the response has the opposite effect and is associated with less than the average number of offspring. This outcome is consistent with predictions from evolutionary theory.
2. Psychotherapeutic efforts to alter the behaviour/responses of persons who engage in submissive strategies are only moderately successful. In part, this outcome is likely to be due to trait variation: in essence, certain persons lack the capacity to develop novel behaviour strategies, and it is these persons who are likely to respond poorly to psychotherapeutic efforts. Data from studies of personality disorders and dysthymic disorder suggest that the inability to develop novel behaviour strategies is a heritable trait, as well as one associated with highly biased views of others' willingness to give and to cooperate, as well as atypical self views. To the degree that heritability is a contributing factor, psychotherapeutic efforts are likely to be less successful than environmental manipulation. Evidence from studies of dysthymic disorder patients support this prediction. Similar outcomes have been modelled in nonhuman primate studies.
3. Available evidence suggest that cognitive models of depression are likely to yield fewer insights than behaviour-physiology interaction models. In the latter, the behaviour of others triggers selected physiological responses in ego and physiological state changes occur. In turn, cognitive and feeling states are altered. Evidence supporting this view will be presented.
4. The great preponderance of evidence suggest that clinical depression is a final common pathway phenomenon. While elements of involuntary submission may be present in the majority of patients with depression, whether submission is a primary or secondary phenomenon needs to be determined. Evidence supports both possibilities. If it is secondary, therapeutic efforts to alter the strategy may be misdirected. (*Psychiatry*)

DO WE USE CULTURE TO REDUCE OR ENHANCE PRE-EXISTING SEX DIFFERENCES?: A STUDY OF GENDER DIFFERENCES IN THE WEIGHT ROOM

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Culture can be used to reduce biological differences between individuals or groups, or to enhance them. Some argue that we should encourage uses of culture and its products in ways that counteract traditional sex role socialization. One recent example of this, is the encouragement of women to engage in more of the sports, fitness, and body-building exercises that had once been thought of as masculine. One result is that professional women athletes are now giving performances that were once thought to be possible only for men. It was my suspicion however, that most non-professionals utilizing athletic technology were doing so in ways that would enhance, rather than reduce, pre-existing sex differences. I hypothesized that men and women who utilized weight- room equipment on their own (rather than as part of an organized program) would be doing so to increase their attractiveness to the opposite sex, and thus, would use the equipment to enhance gender signals. Thus, men were hypothesized to spend a disproportionate amount of time building up muscles of the upper body (which is, pound per pound,

twice as strong in males as in females), while women were hypothesized to spend a disproportionate amount of time building up leg muscles (which, pound for pound, are as strong as those of men), and to avoid increasing muscle mass in the upper body. (*Poster Presentation*)

ETHOGENY AND BIOGENETIC RULE: WHY DO BABIES SMILE BEFORE THEY DISPLAY FEAR OF FOREIGNERS?

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The Problem: Morphogeny, according to the modified biogenetic rule states: Early stages of phylogeny will be recapitulated in early stages of ontogeny. Some deny that this is also valid for behaviour. But this problem deserves more consideration, following Riedl that a) no information of the genetic code must be erased, without the program breaking down and b) a new development of vanished patterns is extremely improbable, as they develop in the interaction with a unique combination of factors. A third, important point is that information belongs to a category higher than organs. Therefore, the rules of ethogeny (as I call it) can never be identical with those of morphogeny. Ethogeny takes place in a steady interplay with morphogeny. For this reason, in phylogeny and ontogeny, the "innate behavioural information substrates" (IBIS) have to develop in coordination with the corresponding phases of morphogeny. If we include behaviour of recent species, we can deduce a prenatal development psychology in three phases: Seeing primal mistrust before the eyelids close up (reptilian phase), blind primal trust (altricious phase of insectivora and lower primates), seeing primal trust (higher primates). Primal mistrust has to be inhibited during the blind phase and reactivated when the young begin to explore the world, as lack of primal mistrust would be a lethal factor. In morphogeny the decision pattern is "else...or", hand or hoof, in ethogeny "as well...as", and the coexisting behavioural patterns constitute the parliament of instincts. Results: For the phylogeny of behaviour, I suggest following modification of the biogenetic rule and call this the "ethogenetic rule". The development of IBIS in ontogeny recapitulates their development in phylogeny (the epigeny). We have to discernate clearly this phase from the phase where such patterns become phenotypic: These events will be determined by their usefulness for fitness. Functional patterns of behaviour may be modified, but their IBIS never will be interphenes. The fate of the IBIS of patterns which became dysfunctional need more research. (*Development*)

CONTRASTING THE STAGES OF HUMAN EVOLUTION

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The comparison is not between various groups alive today, but is a comparison of what can be inferred of the behaviour of hominids at various significant stages in their evolution. Hence, besides being a comparison, it is an historical account of the evolutionary stages that led to ourselves. My paper will contrast my inferences of the social structure of hominids at the following times. All dates are dates of origin and are given in thousands of years ago. Homo habilis (2,400), Homo erectus with the Acheulean handax (1,400), earliest modern Homo sapiens (around 200), the Cro-Magnons of Europe (35), the Classical cave painters (16 to 10.5). In most of these stages, according to my inferences of social structure, females had unusual influence on social structure. The role of females was quite different at different times, however. My major references are the work of Katharine Milton, Merlin Donald, Thomas Wynn, Paul Mellars, and Ann Sieveking (based on the work of Andre Leroi-Gourhan). (*Poster Presentation*)

NEURO-EVOLUTIONARY FRONTO-LIMBIC IMBALANCE PROPOSED IN: "LIMBIC PSYCHOTIC TRIGGER REACTION" WITH HOMICIDE (13 CASES)

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An evolutionary framework is applied to the study of a novel, unique and repeated pattern of a dozen interrelated symptoms and signs, proposed as "Limbic Psychotic Trigger Reaction" (LPTR). So far, LPTR has been identified in 13 white male loners, who committed out-of-character, motiveless homicidal acts, neither planned or concealed, and remembered with horror after the brief episode, lasting up to c. 20 minutes. The acts were committed with a flat affect, typically toward a stranger, who unwittingly had provided an individualized trigger stimulus. Such a stimulus (of any modality) vividly revived (within c. 5 minutes) past, intermittently experienced mild to moderate traumata. Further, there was typically first time sudden psychosis (formed or unformed hallucinations and delusions, mostly of grandeur), as well

as autonomic hyperactivation (e.g. nausea, dizziness, hot and cold sensations, loss of bladder control or ejaculation).

Three main sources for objectification of LPTR are provided: 1) experimental results from mammals; 2) human experiments with limbic electrode implants; 3) cognitive-clinical studies including some scattered positive objective test findings (scalp EEG, PNEG, MRI or CT scan).

Thus, a transient breakdown of the human fronto-limbic balance is proposed in LPTR, with a brief reactivation of early evolutionary limbic mechanism: An external stimulus is endowed with exaggerated meaning (amygdala), which then acts as "primer" (hippocampus) for the memory of mild to moderate, but not habituated (hippocampus) past traumata, capable of "kindling" (amygdala) a brief limbic episode, reminiscent of a predatory attack (amygdala-hypothalamus). (*Brain & Behaviour*)

A PRELIMINARY MODEL OF EMPATHY

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We define empathy as experiencing the same affect as another individual. Empathy often occurs through emotional contagion-- perceiving the emotional expression of another and adopting the corresponding affect oneself. Thus, empathy is a special case of the general responsiveness to emotional expressions. Empathy may help synchronize play and other joint activities, or may allow the individual to exploit the perceptions of another, as in fear. Humans may also possess a capacity for self-empathy--for vicarious experience of previous emotional events, complete with affective tone. We retain mental representations of emotion-charged experiences; often we engrain these events by obsessive rumination. These representations could then alter our response tendencies in similar future situations. Thus we could learn from experience in ways more complicated than conditioning. Also, we may learn observationally by vicariously registering others' experiences, or even less directly by identifying with a dramatic actor or with the butt of a joke. This capacity to anticipate contingencies would also aid long-term planning; we conjure up hypothetical scenarios and anticipate their affective payoffs. These two capacities combined--empathy and self-empathy--may allow us to respond innovatively to an individual needing help. We empathize with the other, desire to intervene, and then consult our past experiences to formulate an appropriate response. This system may mediate flexible parental care, kin altruism and reciprocal altruism. Repeated episodes of helping may enhance social bonds because similarity (in this case, of affective experience) promotes mutual aid, as well as because of gratitude. (*Development*)

GENETIC AND ENVIRONMENTAL CONTRIBUTIONS TO CRANIAL CAPACITY

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Data from 236 pairs of twins (472 individuals) aged 12-18 years were used to examine factors influencing cranial capacity, an indirect estimate of brain volume. Subjects were 187 males and 285 females, 222 whites and 250 blacks. Intraclass correlations were computed and genetic and environmental models fitted. Group differences were found. After adjusting for the effects of age and body size, boys averaged 1,290 and girls 1,229 cm³, whites averaged 1,269 and blacks 1,251 cm³. With corrections for age and stature, the heritability for the sample as a whole was 51 percent with 6 percent due to common family environment and 43 percent due to unique environmental factors including error variance. The proportionate differences did not differ systematically by sex but there was a nonsignificant trend for factors common to the family environment to have a higher impact on cranial capacity in blacks than in whites (28% versus 0%). (*Poster Presentation*)

SEX DIFFERENCES IN PATRONS' APPEASEMENT OF THREATENING DOORMEN

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While the inhibiting effect of sexual arousal on aggression has been experimentally confirmed, the role of sexual signalling as an appeasement in a threatening situation awaits naturalistic study (Grammer, 1993). Entrances to nightclubs which screen incoming patrons for suitability of dress and decorum are excellent research posts for studying dominance and submission and social strategies in general. Incoming patrons are subjected to the threatening presence, and sometimes actions, of doormen in a predictable place and time. Observations in Brisbane, Australia, indicated sex differences in approach to male doormen guarding the entrance to a nightclub. Females used affiliative signals more than males,

including flirtation behaviour directed at the doormen (Salter, in press). This qualitative finding was tested quantitatively at an exclusive Munich nightclub. Single male and female patrons were videotaped approaching doormen. Dominance, affiliative and sexual signals were coded in gesture and dress (tightness and amount of skin visible). Female patrons showed significantly more affiliative and sexual signals than males, who showed more submission. Results support Eibl-Eibesfeldt's (1990) analysis of the interaction of dominance and sexual behaviour. The method and findings also have application to the study of institutional dominance. (*Gender Signals*)

THE EMOTIONAL BASIS OF SPEECH AND LANGUAGE

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An analysis of emotional behaviour as thwarting and conflict displays (Salzen, previous ISHE meetings and Int.J.Comp. Psy, 5, 47-88, 1991) can provide a basis for the emergence of speech and language in phylogeny, ontogeny, and in present adult function. The thwarted actions appear as specific somatic intention movements that give constant voiced forms to accompanying autonomic respiratory changes. Their stylisation and repetition with intensity of motivation, typical of ritualised animal signals, can account for the basic consonant-vowel-consonant-vowel nature of words. Thus speech and language appear emotional in origin yet, paradoxically, lexicons are rich in object words and actions while feelings are still communicated largely non-verbally or by object metaphor and simile. Furthermore, the neural representations of speech and language are cortical, voluntary motor, and left-hemisphere, as are those of the hand and manipulation. This is consistent with the origin of speech in the social use and manufacture of tools. Verbal symbols become referents for both the stimulus objects and their associated use. These are the imperative verb-nouns which are common in lexicons and which appear early in ontogeny and probably in phylogeny. Both object manipulation and speech are voluntary actions requiring external feedback, visual and auditory respectively, and left hemisphere cortical function. However, the instigation of speech may still depend on the involuntary activation and thwarting of subcortical motivational and emotional systems. Sources of data for these claims will be presented. (*Brain & Behaviour*)

URBAN LIVING CONDITIONS AND HUMAN BEHAVIOUR

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Planning of modern housing projects must take into account that human well-being is dependant on necessities related to human evolutionary history. Territoriality, security, a balance between privacy and community are the basic requirements.

In general, housing space covers the need of privacy, whereas the importance of the residential environment has been neglected for a long time. Consequences were a loss of social coherence, anonymity, vandalism and increasing crime rates.

On a game theoretical basis, we would predict that a tendency for cooperation grows with an increasing probability of future meetings between inhabitants. The higher the possibility to reencounter residents, the more interactions are expected.

Frequent meetings lead to reciprocal recognition and enable the inhabitants to control their environment by detecting strangers. This responsibility results in identification with a common territory. Friendly interactions between residents are motor and indicator of satisfying living conditions.

For the study, seven public places of different residential blocks were selected. Interactions between the inhabitants were observed, using categories of behaviour, such as Greeting, Laughing, Talking, Sitting and Playing. Satisfaction with the living conditions was obtained by questionnaires. The degree of cooperation was measured by "lost- letter"-return rates. In addition, we quantified the structural features of the street blocks which were linked to satisfaction of their inhabitants. (*Contemporary Environments*)

MARITAL POWER DYNAMICS: A MULTIMEASURE APPROACH

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This study is an investigation of the resource conceptualizations of Salifios-Rothschild (1976) including

self-reported love, socioeconomic resources, decision-making, verbal-nonverbal communication, and decision-making outcome, as predictors of marital satisfaction. Both ethological and questionnaire methods were utilized. Historically, marital power has been viewed as growing out of a stable base (financial resources, prestige, education) and thus representing a static entity. Researchers in the area of marital power and decision-making have concluded that the marital relationship is most accurately defined by a reciprocal interactional process of the exchange of differing resources available to each partner and the cost of these resources, both in and out of the marriage. Safilios-Rothschild criticized "resource theory" as being too narrowly defined and conceived, reflecting traditional masculine sex-role stereotypes, excluding the intangible resources of love, sex, companionship and personal service. Moreover, traditional resource theory failed to consider the "cost" involved in receiving the benefit of these resources or the cost incurred from their withdrawal. Other researchers (Godwin & Scanzoni, 1989), have found emotional interdependence of the partners, as well as relative resources to be an important factor in predicting communication processes and outcomes in couple decision-making. A recent study (Russell & Wells, 1990) speculated that a measure of decision-making from their Marital Questionnaire may be less a definitive measure of the balance of power than the difference between the extent to which the partners love each other. They posited that the one who loves less may have more power.

Because previous studies have yielded contradictory results with regard to couples' perceptions of resources and decision-making power, and more objective measures of resources and decision-making power, this study utilized both questionnaire measures and live observation measures. Forty American couples completed the Russell-Wells Questionnaire (1986) and also participated in a decision-making task.

Results are discussed in terms of (1) husbands' and wives' individual perceptions of their own and their partners' behaviours; (2) the correlations among self-reported measures of resources, observational measures of verbal (affiliative, cognitive, coercive), and non-verbal behaviour and the outcome of an experimenter-posed decision. (*Gender Dynamics*)

HOMO VESTIGIUS: GOOSEBUMPS, FOOTBALL AND WAR

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Like the circling of dogs before lying down, we humans, from boardrooms to battlefields, are stuck with may vestigial behaviours which are excess baggage at best. Some are harmless, even amusing, but others are destructively maladaptive, and some dangerously threaten our future survival. It's not only McLean's R-complex and limbic leftovers and Barasch's "Neanderthal" predispositions which cause us trouble and tragedy. There are some more recently selected, but now, old-fashioned saboteurs at the highest cortical levels in our corporate brains. Our rational cerebral young boss is not in full control. We probably have more vestigial attractions, aversions, motivations, inclinations, motor programs, and cognitive leftovers than any other species, yet the concept of vestigial behaviours is virtually unknown to most social scientists and biologists. This presentation will explore the concept and consider some implications. (*Brain & Behaviour*)

THE STUDY OF ACTIVATIONAL HORMONAL EFFECTS AS A METHOD FOR ESTABLISHING GENETIC BASES OF SEXUALLY DIMORPHIC BEHAVIOURS

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Studies of the role of gonadal hormones have been instrumental in establishing the genetic bases of sexually dimorphic behaviours. Most of these studies have dealt with the organizational properties of hormones; that is, their permanent influences on the organism's developing brain. Such studies, however, have generally used infra-human animals, where organizational effects can be experimentally manipulated, though they have been occasionally inferred in humans based on such correlates as maturational level, physical characteristics, and atypical hormone production associated with medical disorders.

The crux of the present paper is that genetic bases for sexually dimorphic behaviours may be more suitably investigated in humans in terms of activational hormonal influences; that is, shorter term effects of fluctuations in specific hormone levels due to naturally occurring cycles or other transitory occurrences. We will describe several areas of study in progress of this nature involving cognitive, attitudinal and affective variables. (*Brain and Behaviour*)

THE INVOLUNTARY SUBORDINATE STRATEGY IN DEPRESSION: PSYCHOTHERAPEUTIC

IMPLICATIONS

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Case illustrations are used to illustrate the "involuntary subordinate strategy", "acceptance" and "submission". The "involuntary subordinate strategy" is a psychobiological genetically preprogrammed response pattern which is elicited by losing a hierarchical encounter or by loss of a loved one. Its function is to turn off aggressive behaviour and angry feelings, and to facilitate "acceptance" and "submission". "Acceptance" is an intrapsychic process by which an individual becomes reconciled to the cause of the "involuntary subordinate strategy", whether this is low social rank or the absence of a loved one. Submission is a social signal which informs the winner that acceptance has occurred (even though it may not have occurred and the signal is therefore deceptive). The acknowledgement of submission by the winner leads to reconciliation.

A prolonged intense involuntary subordinate strategy may manifest as depression or other illness. One psychotherapeutic task is to terminate the "involuntary subordinate strategy" by encouraging the patient to choose between a wider range of strategies; there may be a strategy of deliberate self-assertion aimed at winning the conflict which was being lost; or acceptance of one's inability to realize certain aspirations; or a strategy of escape and the redirection of resources into more promising ventures. (*Psychiatry*)

PRECONDITIONS FOR DEMOCRACY: A NEODARWINIAN PERSPECTIVE

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Many people have recently proclaimed that democracy is ascendant throughout the world and will inevitably triumph in the competition among political systems. In this paper, we propose to evaluate this sentiment, using neodarwinian evolutionary theory as the point of departure. Our point is simple: democracy is certainly possible, but there are serious problems that must be addressed before we can confidently state that democracy is the dominant form of political organization.

To begin at the standard takeoff point for social science, democracy needs certain preconditions to provide the propitious circumstances needed for its nurturance. These include such unexceptionable factors as a reasonable degree of wealth in a society, dense communication networks, and a moderately well-educated populace. However, there is more to the picture than this. Deeper background elements must also be understood.

This is where a neodarwinian perspective becomes important. One can make a strong argument that natural selection has created in *Homo sapiens* a species designed to accept the authority of dominant animals within naturally occurring groups/societies. Consistent with this is a variety of findings from psychology (Milgram's famous experiment on obedience to authority), social psychology (conformity to group norms), child development (the tendency for children to form hierarchies at a very young age), and so on. With the preconditions in place, noted earlier, democracy has a chance of surviving--but it is against a backdrop of a tendency toward non-democratic impulses. We conclude by discussing the challenges that a neodarwinian perspective raises and the issues that must be grappled with by political observers. (*Politics*)

SEX, POWER AND CONFLICT IN SEXUAL HARASSMENT CASES: EVOLUTIONARY AND FEMINIST PERSPECTIVES

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In this paper, I explore and analyze the relative merits of the feminist and evolutionary perspectives for explaining and predicting the occurrence of, and influences on, unwanted sexual attention in the workplace. Specifically, I provide and analyze the content of reports in the Canadian legal literature on sexual harassment cases that have proceeded to settlement before legal tribunals. This context of officially filed complaints of sexual harassment provides one of the clearest examples of cases where issues of sex and power, individual or organizational objectives, and personal and professional goals and desires compete and conflict. My analysis will show that the traditional "power"-based feminist perspective is insufficient as a general model for explaining the patterns of unwanted sexual attention in organizations, and that a perspective rooted in the evolutionary psychology of human sexuality can be a

very powerful explanatory and predictive model. However, I will also argue that a synthetic model, one that explicitly recognizes the influence of both proximate and ultimate influences (as the evolutionary psychological model does), is needed to fully understand this very complex sociosexual problem in the workplace. (*Gender Dynamics*)

THE INVOLUNTARY SUBORDINATE STRATEGY: A COGNITIVE BEHAVIOURAL PERSPECTIVE

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Do ethologically-derived formulations of depression articulate with cognitive behavioural accounts of this ubiquitous disorder? In this paper, I will argue that the ethological and cognitive behavioural approaches can afford complementary and mutually enhancing perspectives on depression when considered in an integrative fashion. In particular, I suggest that, whereas cognitive behavioural models can provide clinically valuable insights into the proximal mechanisms mediating the onset and maintenance of depressive phenomenology, ethological formulations may offer a more satisfying distal account of the biosocial goals putatively mediating these depression-related patterns of cognition and behaviour. I will illustrate the theoretical and clinical utility of combining these approaches with specific reference to Price and Sloman's (1987) ethologically-derived conceptualization of depression as a yielding response (i.e., the involuntary subordinate strategy). My analysis suggests that (a) to be theoretically satisfying, cognitive behavioural models must take account of the goal-directedness of depression-related patterns of cognition and behaviour, and (b) to maximize their clinical utility, ethological models should seek to identify and understand the specific cognitive and behavioural components of putative biosocial strategies. (*Psychiatry*)

ASTRONAUT BEHAVIOUR IN REAL AND SIMULATED SPACE MISSIONS FROM THE ETHOLOGIST'S VIEWPOINT

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During manned space missions each astronaut has to adapt to the new environment characterized, on the one hand, by physical factors such as weightlessness, total three-dimensional space and confinement, and, on the other hand, by the peculiarity of living among a small group that work together in close proximity, yet socially isolated. As a consequence, adaptation to these new conditions is governed by a set of processes that is covered by physiological, psychological and behavioural fields. From the ethologist's viewpoint, the question arises regarding the way in which the astronaut organizes his relation to the environment over time. The behavioural changes that will occur become the observable evidence of this relationship.

The present ethological study was based on a quantitative description of the subject motor activity from video recordings made in 11 American orbital flights (n=29 subjects), in 8 French parabolic flights (n=12) and in 2 European simulation chamber stays (n=10). The frequencies of a repertoire of movements, postures and orientations were evaluated, and completed by the measurement of the inter-individual distances. The results show a diversification of motor strategies, a construction of sensorial information network and locomotor activity patterns over successive adaptive stages (from the first seconds to one week). The subject's spatial organization was characterized by standard inter-individual distances at the initial period, closer proximities at the mid-period and larger ones at the final period (over two months). (*Contemporary Environments*)

THE "ROMANTIC LOVE" ASPECT OF HUMAN REPRODUCTION

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As human ethologists, we search for the species characteristics which form the substratum on which cultures play their varying tunes. Academic disciplines are entangled in intricate systems of peer review, grant acquisition, and surrender to stifling social pressures. Hypothesis-testing and statistical analysis have their place, but they should not, as they typically do, have priority over elucidation of variables. Categorically and illogically ruled out are the only methods of basic search possible or appropriate to some areas of critical study. The answer is not to pretend those troublesome topics are nonexistent or unimportant, but to use what we have as well as we can, to go as far as we can with what we have, and to remember that the test of science is not method of data acquisition but interpretation of findings. In this paper, I present my study of the "limerence" aspect of human reproduction as a case history in

nontraditional ethological inquiry into proximate mechanisms through a step by step exposition of what was done, what was found, what it might mean to human ethology, and obstacles encountered in the attempt to disseminate all of the above through established communication modalities. Accepting our nature offers better hope for protection against the unwanted remains of traits that developed in ancient environments than does pretending we have a freedom from genetic influence which we do not in fact have. Love is a force that propels ultimate human survival. It may be among the most unfree of states. (*Gender Dynamics*)

A CROSS-CULTURAL STUDY OF MARRIAGES

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Analysis of data on over 12,00 British couples, 450 Turkish couples, and 230 US couples continues. Some miscellaneous findings on the various samples will be presented. For example, some correlates of depression and of spouse abuse in Britain have been identified. In Turkey, arranged marriages tend to be less satisfying than love matches. Data on the US sample, consisting of black and of white couples, are now being analyzed. The general hypotheses underlying the study are that (1) marriage, being species-wide, has similar properties around the world, and (2) the criteria for marital satisfaction resemble those for mate choice cross-culturally. Consistent with the latter hypothesis, the British study showed that spousal similarity was related to satisfaction, as were moderate husband dominance of decision-making and wife's attractiveness. Spousal similarity (homogamy, or positive assortative mating) may enhance offspring survival by conserving genetic complexes that were adaptive in the parents' environment; consistent with this, assortative mating has been observed in a variety of species. Male dominance may connote competitive success and hence be desirable for the female to seek. Female attractiveness indicates expected fecundity (Dev Singh's work on waist-hip ratio). (*Gender Dynamics*)

HUMAN BRAIN SIZE AND INTELLIGENCE

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Psychology has long been interested in the possible relationship between brain and head size and the intellect. To investigate this relationship, studies utilizing a myriad of measurement techniques have been carried out over the past 100 years, with the general finding that there does exist a small positive correlation between intelligence and head size (with a mean r of about .19), although debate surrounds these findings and their interpretation. Much of the criticism surrounding these studies is associated with the measurement techniques, which have predominately been restricted to external head measurements as estimates of brain size. Current brain imaging techniques such as magnetic resonance imaging (MRI) do away with this problem and allow for direct measures of brain size. In a sample of 40 healthy right-handed adult females it was found that brain volume measured via MRI correlated $r = .395$ ($p = .05$) with full scale IQ, clearly indicating that there is a positive relationship between the size of the brain and intelligence. A second sample, a replication with subjects currently being collected, comprises healthy right-handed adult male siblings, who are also undergoing MRI. The use of siblings in this second experiment allows for the assessment of within, in addition to between, family relationships, and so can begin to consider the nature of the brain volume-IQ relationship. (*Brain and Behaviour*)

MOTHER-CHILD SEPARATION AND SOOTHING STRATEGIES

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What strategies do human mothers choose to ease their 24-month-olds' separation? For one upper middle class American ethnic subculture, we studied how the mother's strategy choice is related to her child's temperament, to family style and structure, and to her own temperament and self-soothing habits. Method: One hundred and one mother-child pairs were studied as children first entered daycare/nursery school at one synagogue in a homogeneous community. On-site naturalistic observation would have been incomplete even if possible. Thus, data were mothers' answers about strategies for soothing her child and herself, about child's age, sex, birth order, separation upset, and 8 temperament variables. Also collected were the Family Expressiveness Questionnaire (FEQ) and spouses'

rating of mothers' temperament. Results : Daycare (21=+mos., n=20) and School (28=+mos., n=81) were analyzed separately. The 10 reported strategies and 34 variables were factor analyzed together. Variables loading high with strategies (3 mother and 3 child temperament variables and the FEQ scales) were re- factored with the strategies. In both age groups, child's and mother's irritability and activity loaded on separate strategy factors. Thus, mother's and child's temperament did not jointly influence strategy choice. Irritable mothers underused two otherwise most frequent strategies,(verbal reassurance and comfort contact). Younger irritable children got much abstract explanation and older ones much quick exit; mothers at both activity extremes urged their children not to cry. Non-active younger children got much quick exit and physical distraction or much relevant explanation; non-active older children factored together but without associated strategies. In both age groups, negative dominant family expressive style loaded with mother's irritability. (*Poster Presentation*)