Social Fabrics of the Mind

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7 Alternative Channels for Negotiating Asymmetry in Social Relationships

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THE YIELDING SUBROUTINE OF RITUAL AGONISTIC BEHAVIOUR

Darwin (1871) was the first to point out that socially mediated asymmetry between members of the same sex of the same species would, if associated with differential reproduction, be an important force in evolution. He described it as the intra-sexual component of sexual selection (the other component being mate choice), and he suggested that sexual selection might have an importance in evolution approaching that of natural selection. The theory of sexual selection has received support over the years (Campbell, 1973); recently, increased reproduction in men of high rank has been demonstrated in more than 100 pre- and non-industrial societies (Betzig, 1986), and reduced reproduction in low-ranking females of a variety of animal species (Kevles, 1986). Male animals are well known to show an association between reproduction and social rank, particularly those that have polygynous or lek forms of mating system; and although there are no data available for human females, social heredity (Schiff & Lewontin, 1986) ensures that high-ranking females will have excess grandchildren because of the increased reproduction of their sons.

Ritual Agonistic Behaviour

It follows from Darwin's theory that mechanisms for generating social asymmetry are likely to be selected for. In fact, only one such mechanism, ritual agonistic behaviour (RAB), appears to be common in vertebrate

species. The discovery and description of RAB is one of the main achievements of classical ethology (Lorenz, 1981). RAB is a form of signalling between two individuals, the result of which is the creation, readjustment or reinforcement of asymmetry between them (see Hinde, 1979). RAB converts a symmetrical relationship (characterised by a potential for escalating conflict) into an asymmetrical or complementary relationship with an agreed upon winner and loser, and having the properties of a stable system (Bateson, 1972). The subsequent roles are differentiated in that the winner occupies a role described as dominant, or higher-ranking, or territory owning, whereas the loser occupies a role described as subordinate, or lower-ranking, or non-territory owning. A matrix of asymmetrical relationships forms a social hierarchy (Kaufman, 1983).

It is a remarkable fact that all the main elements of RAB are seen in reptiles. Some species of lizard defend territories; others establish dominance hierarchies based on individual recognition (Carpenter, 1978). The process of RAB can be seen with particular clarity in lizards, partly because states of dominance and subordinacy are reflected by different skin colours, and partly because the agonistic behaviour is not complicated by any form of affiliative behaviour. Subordinate lizards secrete excess corticosteroids, as do subordinate mammals (Greenberg & Crews, 1983).

The Ritual Agonistic Encounter

When human strangers come together, they usually meet to perform a task, or for recreation, and the issue of dominance does not immediately arise. They are in what Chance and Jolly (1970; see also Introduction and Chapter 1) called the hedonic mode. This state of affairs may continue indefinitely, particularly if the strangers are reasonable people and not too many controversial decisions have to be made. However, in many groups, conflicts arise that cannot be reconciled according to the methods of the hedonic mode, and then there is a switch to the agonic or agonistic mode. This is a well recognised phenomenon in group psychotherapy (Kennedy & MacKenzie, 1986), in which the task of the group is increasingly interfered with by some mysterious process that often turns out to be rivalry for leadership. What happens then is something we share with most other vertebrate species.

Many species of bird (Schjelderup-Ebbe, 1935) and primate (Kummer, 1971) cannot live in symmetrical relations with members of the same sex, and so every meeting with a stranger starts with a ritual agonistic encounter. Schjelderup-Ebbe (1935) has described the meeting of two hens with its inevitable outcome that one dominates the other. Although the end is always the same, the method varies according to the aggressiveness of the hens. If both are fearful, they may both retreat, and then it is the one who recovers first who dominates the other. If one is fearful and the other

aggressive, the fearful one submits quickly after a brief period of mutual appraisal. If both are aggressive, they start pecking each other and continue to do so until one gives up and flees; the one who gives up subsequently becomes subordinate to the other and does not retaliate to the other's pecks. Even after the asymmetrical dominant/subordinate relationship has been established between two hens, pecks continue to be delivered by the dominant to the subordinate hen, although at a lower intensity and frequency (on what appears to be an unprovoked and random basis), and such pecks appear to have the function of keeping the subordinate bird in her place; this "down-hierarchy" pecking may have a different motivational base than the symmetrical pecking of the agonistic encounter. If the subordinate bird pecks the dominant, retaliatory pecking by the dominant occurs with great intensity but, particularly if the dominant bird is old or sick, the subordinate bird may reverse the rank order and assume the dominant role. This work by Schjelderup-Ebbe has been confirmed (Wood-Gush, 1955), and the same general scheme has been found to occur in reptiles and mammals, usually with some species-specific activity taking the place of pecking.

Of course, human social life contains many other mechanisms for generating and maintaining asymmetry between members of the same sex, such as warfare, social class, primogeniture, elections, racial prejudice, vocational competition, gambling, hero-worship, and externally imposed rank. Therefore we might expect RAB to operate as a primitive mechanism underlying the products of more recent evolution (such as the mammalian affiliative systems of parental care, pair-bonding, and alliances) as suggested by MacLean (1985), and also underlying the immensely complex structure of human cultural development. This is in the tradition of thought that Durant (1981) has called "the beast within", and is in contrast to an opposite view that human behaviour and its variations are entirely due to culture and have not been subjected to the forces of natural selection (see Hodes, 1986). This is not the forum to debate this important controversy, but research that is directed according to *tabula rasa* assumptions may ignore important variables, as I hope to demonstrate later in regard to the expression of hostility in depression. Human life is so complex that certain patterns may not be visible unless first we know what to look for, and one source of this prior knowledge is comparative ethology, the study of behaviour patterns with determinants deeply embedded in the vertebrate genome.

RAB and Psychopathology

It was M. R. A. Chance, the editor of this book, who first drew my attention to RAB as a potential cause of psychopathology, in his lecture on the social behaviour of a colony of long-tailed macaque monkeys. It

certainly seemed that the punishment meted out by the high-ranking to the low-ranking monkeys might cause them some mental perturbation, and the cringing behaviour of the low-ranked was consistent with the presence of what we recognise in human patients as depression and anxiety. Moreover, a mental state such as that of my depressed patients, characterised by ideas of inferiority and unworthiness, seemed ideally suited to reconcile the low-ranking monkeys to their inferior situation. From this, it seemed possible that the function of depression, selected for during evolution, might be to subserve low rank and fall in rank, whereas the converse function of elevated mood might be to subserve rise in rank (Price, 1968). This function of depression in terms of social competition seemed more likely than the other alternatives which had been put forward (Price, 1972), and also more likely than the conclusion reached by Klerman (1974) that depression has no adaptive function at all.

I should say that by depression I mean not depressed mood as an emotion, but an episode of altered behaviour lasting weeks or months that, when it appears inappropriately, or with exaggerated intensity or duration, is liable to be labelled depressive illness. Good descriptions of the current state of knowledge about depression are given by Gilbert (1984, and in press).

Recently Leon Sloman and I (Price & Sloman, 1987) re-examined the hypothesis that depression evolved as the yielding component of RAB. We called this yielding component the yielding subroutine (YS) of ritual agonistic behaviour (RAB), or YS/RAB for short. The instructions required of such a yielding subroutine are two-fold: first, they must ensure that the yielder yields and does not try to make a come-back, either by recontesting the issue or escalating to a less ritualised level of conflict; and, secondly, they must ensure that the yielder reassures the winner that yielding is really taking place, so that the winner ends his RAB and ceases to inflict punishment on the yielder. In that re-examination, we devised theoretical instructions for the yielding subroutine that satisfied these requirements, and also were consistent with the clinical features of depressive illness. We showed that two different kinds of yielding subroutine are required, one subserving social change and the other subserving social homeostasis; the first helps the yielder adjust to subordinate rank after being dominant or equal, the other helps the yielder to maintain low rank and to forego the temptation of attempting to rise in rank. Both kinds of yielding require the same signal aimed at the dominant individual, one that reassures that the yielder is really yielding and not planning a come-back. In our paper, we dealt briefly with the signal of the yielding subroutine (YS/RAB), as outlined next.

Previous Formulation

We suggested that in YS/RAB-modelled depression the appearance of the depressed person has the function of reassuring a hypothetical winner that further discouragement is not necessary. There is, admittedly, no positive signal of incapacity, but the general woebegone appearance is such as to reassure the adversary that the depressed person is incapable of making a come-back. In fact the very lack of a signal (which would represent at least signalling capacity) is likely to reassure others that the absence of capacity is genuine and not a deceptive signal, designed to lull them into a false security while, underneath, preparations for a come-back are secretly being made. This signal of depressive incapacity appears to be similar across species, which is presumably the reason why Schjelderup-Ebbe as a human being was able to recognise it in the bird.

In the language of communication theory, the YS/RAB is a communication couched in terms of metacommunication. It appears, on the surface, to be a metacommunication to the effect that "I am too incapacitated to communicate", whereas underneath it is really a communication saying "I am too incapacitated to fight back." To send such a complex message is quite a manifestation of social skill. In fact, we could say that the depressed individual, as yielder, has the social skill to send a message that denies such skill, in a communication that is received *not as a communication but as an observation of fact.* (Italics by request of the Editor.)

I shall expand this discussion of the signalling aspects of the yielding subroutine by asking, first of all, what signals cause the yielding subroutine to occur; and, secondly, what instructions are necessary to ensure that the signals emitted by the yielder reassure the winner, and how do these instructions compare with the signal aspects of depressive illness. I argue that the signal given off by the depressed person is different from normal signals in two main respects.

Firstly, it is a presentation of the total self for evaluation by the other that is apprehended by the other, not in the way that a submission signal is received, but as a form of judgement about the sender made by the receiver. In other words, the receiver does not identify the sender as someone who is signalling. If the depressive signal is given at the same time as a submission signal, it is acting as a paracommunication, given simultaneously along another channel, and conveying the message, "Even if I did not want to submit there is nothing I could do about it." To the extent that the depressive signal is a message about a signal, conveying the message, "I am too incapacitated to signal properly", it comes into the category of metacommunication, being a signal at a higher logical level than the other signal (Watzlawick, Beavin & Jackson, 1967). On looking at a (male) adversary signalling defeat, the winner registers, "He knows he

has been beaten"; on looking at an adversary manifesting the yielding subroutine, the winner registers, "That is a broken man (or woman)."

Secondly, the signal is transmitted in the hedonic mode but it relates to the agenda of the agonistic mode, so that it is likely to be dealt with by the receiver along a channel other than the one dealing with ongoing business; and, to an observer, it is likely to appear incomprehensible.

A Psychiatric Look at Ritual Agonistic Behaviour

Giving Up. Looking at ritual agonistic behaviour from the perspective of a psychiatrist, I instinctively look at the behaviour of the loser of the agonistic encounter. The medical services are concerned with losers rather than winners and, whereas the loser of a non-ritual encounter is likely to be taken to the Casualty Department or the Orthopaedic Ward, the loser of a ritual encounter may need help of a psychiatric nature. As Chance (1977, p. 191) put it, it is ". . . escape-motivated forms of agonism that lead to breakdown" such as depression, and ". . . any mental cure must aim for a transfer of the individual from the agonic to the hedonic mode".

Another word for losing and yielding is giving up. And, indeed, losers have a lot to give up: they have to give up whatever the conflict was about; and, regardless of the actual issue at stake, they have to give up the satisfaction of getting their own way. This is consistent with the predominating mood of the depressed patient, which is one of "giving up".

An Internal Referee. Another thing to strike me is that the constraint of giving up is imposed on the yielder from within. The winner does not bother to stand guard over whatever has been won; the winner assumes that the loser will behave like a loser and not either recontest the issue at a symbolic level, or escalate the fight to a level at which death or serious wounds are likely. The instructions of the yielding subroutine are like an internalised referee who says: "You have lost. Behave like a loser." The yielding subroutine is a symbolic or ritual equivalent of death or serious physical incapacity, in just the same way as the elaborate threat signals of RAB are a symbolic equivalent of hitting and biting. This is consistent with the fact that many depressed patients feel incapacitated, some feel "dead", and others feel that they are "losers".

Reverted Escape. The loser who lives in a group has a lot more to give up than the loser who is a member of a solitary species. The solitary is usually fighting about the possession of territory and, if the battle over one territory is lost, goes on to contest the ownership of another. As long as more territories are available to contest, it is not adaptive to have more than a brief "giving up" feeling over territory just lost, before moving on to try somewhere else. Group-living individuals, on the other hand, require a much more prolonged and complex yielding subroutine, for they may have to give up habits of dominance and leadership developed over many years.

Unless these habits and attitudes are modified in some way, they are unlikely to be able to stay in the group.

Chance (1986) has given the name "reverted escape" to the movement of an individual, who is motivated to escape, back towards a dominant member of the group, so that the individual is contained in the group. It is similar to the anthropological concept of circumscription (Betzig, 1986), except that reverted escape depends more on the attraction of the group, whereas circumscription depends on the unattractiveness (or unavailability, in the case of imprisoned humans or caged animals) of prospects outside the group.

Gaylin (1983, p. 173) has summarised the psychoanalytical view of the depressive as someone who cannot win but lacks the option of escape: "The depressive has given up all hope of either fight or flight"; his only remaining option is submission, and so, ". . . hopeless and helpless he gives up the struggle".

Time Scale. The yielding behaviours so far described by ethologists are brief matters occupying a matter of seconds or minutes, such as fleeing, or the emission of submissive signals like the subordinate wolf who, rolling over on its back and exposing its vulnerable neck and underparts, gives a signal thought to be ritualised from the cub's presentation of its perineal area to the mother for cleaning (Schenkel, 1967). But, if two group members have been in a relationship for months or years, and have then engaged in a ritual agonistic encounter that may have lasted several weeks or even months, as a result of which a previously equal or higher ranking individual has become lower ranking, then it is likely that the phase of adjustment to the new relationship is going to take longer than a few minutes, and that the yielding subroutine will need to operate for weeks or months. This is consistent with the time scale of depressive states.

Signalling of Resource-Holding Potential

Behavioural ecologists have for many years been concerned with the mathematics of RAB, or pairwise contests, and the selective forces acting on the strategies used in them (Maynard Smith, 1982). They have introduced an intervening variable, which they call resource-holding potential (RHP), to assist in the mathematical analysis of such contests (Parker, 1974; 1984). RHP is a measure of fighting capacity and, on the input side, it is determined by such factors as age, size, weapons, previous success, and availability of allies. On the output side it determines probability of fighting (rather than submitting or withdrawing) in a contest, and also duration and intensity of fighting once a contest has begun. All the attack components of agonistic behaviour, including dominance display, threat display, challenge, attack, and chasing, are looked on as signals of RHP.

There is, to my knowledge, no concept currently in use in psychology

that expresses the equivalent of RHP: it is related to the ideas of self-esteem, self-confidence, and ego strength, but these are poorly defined and in any case refer to confidence in other areas in addition to fighting ability; it is also related to the "dominance feeling", as described by Maslow (1937), and to the sociological concept of structural power (Kemper, 1978). I think RHP is a helpful term in the conceptualisation of RAB and I hope that in extending it somewhat in its psychological meaning I am not distorting the meaning it already has in behavioural ecology.

The Calculation of Relative RHP. In a contest, or ritual agonistic encounter, we are concerned with each contestant's evaluation of their own RHP compared with their assessment of their adversary's RHP—what Parker (1984) has called relative RHP. This is a somewhat complex evaluation, and it might be useful to recognise the following subdivisions of RHP:

1. *Absolute RHP.* Each individual has some general idea of his or her own fighting capacity in relation to other individuals, regardless of who may be his or her specific adversary on any one occasion. This value of RHP determines any undirected dominance display that the individual signals to the world at large, and the directed dominance display (challenge or threat) that each makes to a potential adversary at the beginning of an encounter, before there has been time to assess the other's RHP.

2. *Signal of Absolute RHP.* This is the signal given in the dominance displays mentioned in the preceding paragraph. Such a signal can obviously be faked, but I will assume here that it is an accurate reflection of absolute RHP, in order not to complicate further an already sufficiently complex subject.

3. *Estimate of Adversary's RHP.* I will assume that this is an estimate reflecting the information received from the adversary's "signal of absolute RHP" but, if faking is suspected, the estimate could be revised up or down.

3. *Estimate of Relative RHP.* This is derived from a comparison of (1) and (3) above. We do not know how this comparison is made, but in the simplest case it must give a result that is either favourable or unfavourable, in order to determine the choice between two possible courses of action: escalation and submission. *These actions then become signals in the next round of the conflict.*

There is likely to be both genetic and environmental variation in the degree of superiority of own RHP over adversary's RHP, which an individual requires for a favourable estimate of relative RHP to be made. Individuals requiring more superiority would tend towards the "dove" phenotype described by Maynard Smith (1982); those requiring less superiority would tend towards the "hawk" phenotype.

5. *Signal of Relative RHP.* A contest may last for several "bouts", so that, at each stage, each contestant is estimating the adversary's absolute RHP, comparing this estimate with his or her own absolute RHP to calculate his or her own relative RHP (which may be either favourable or unfavourable), and signalling this relative RHP by either escalating or submitting. For simplicity I will assume a two-stage contest in which a period of mutual *assessment* is followed either by the submission of one contestant or by a period of *engagement* in which there is mutual attack. During the assessment stage, either contestant may submit by giving a signal of unfavourable relative RHP, and thus leave the encounter in a subordinate role but without loss of RHP—what Sloman and Price (1987) called "voluntary yielding"; or the contestant may enter the engagement stage by giving a signal of favourable relative RHP and thus have a chance of winning, but at the risk of losing and being forced into what we called "agonistic yielding", with associated loss of RHP.

6. *Verbal Reports of the Subjective Experience of RHP.* RHP is an intervening variable that determines signalling in agonistic encounters and, in animals, it is easy to maintain this conceptual level. In human beings, however, there may be another output in the form of verbal reports to a third party, such as a friend, a psychiatrist, or an investigator, giving an account of the subjective experience of either high or low absolute RHP, such reports may differ from the signal given to a potential adversary. These verbal reports convey an equivalent of the usual meaning of the terms self-confidence and lack of confidence. Reports of the subjective aspects of signals of *relative* RHP are less common, because the subject is likely to be too busy fighting or submitting, but the signal of favourable relative RHP is likely to be accompanied by feelings of anger, indignation, or irritation, and the signal of unfavourable relative RHP by feelings of being overwhelmed by helplessness. It is remarkable that patients have a very poor memory for their own signals of relative RHP, and in the case of favourable relative RHP there may be total amnesia, as in episodes of "blind rage".

The Two Components of the RHP Signal. Although it may be convenient to amalgamate them for mathematical purposes (Parker, 1984), from the psychological point of view "signal of absolute RHP" is very different from "signal of relative RHP". The two differ in the following ways:

1. *Stage of Assessment versus Stage of Engagement.* Signal of absolute RHP is saying: "This is what I am like; examine me and assess my power", and it occurs in the assessment phase of the agonistic encounter, when the adversaries are confronting each other, or circling round each other in mutual appraisal. Signal of relative RHP is saying: "I am better than you and I will prove it"; it occurs in the engagement phase of the encounter, and consists of very ritualised and species-specific activity, such as re-

peatedly charging at each other head on, as in the African buffalo (Sinclair, 1977), the American bison (Lott, 1967), and the marine iguana of the Galapagos Islands (Carpenter, 1978).

2. *Semantic versus Shannon Information.* In signalling absolute RHP, the adversaries present themselves for examination of all their aspects, having little control over what aspects are attended to; therefore, the information offered to the adversary is very extensive, even infinite, and is, I think, what Krebs and Dawkins (1984) have called Shannon information, and what Lockard (1980) has called a composite signal. In signalling relative RHP, on the other hand, they offer only one "bit" of information (namely, whether escalating or not), and the nature of the signal insists that the adversary pay attention to it and to no other. If the signal varies, it varies in quantity rather than in quality. This is what Krebs and Dawkins call semantic information, and what Lockard calls a graded signal.

This difference is probably due to the fact that in the process of sender/receiver co-evolution the exchange of signals of *absolute* RHP has been a *co-operative* matter, in that, if there is a real disparity between the RHP of the contestants, it is in both their interests that the one with lower RHP should rapidly and efficiently identify the disparity and submit. In contrast, the exchange of signals of *relative* RHP has been a competitive matter during sender/receiver co-evolution, because it occurs only if there is no great difference in absolute RHP and each contestant has a fair chance of winning; each is interested not only that the winner should be decided quickly but also that they should be that winner.

3. *Species Similarity versus Species Specificity.* Signals of absolute RHP tend to be common across species, such as upright posture, confident gait, display of weapons, and large size. Exceptions, such as the blue colouring of the rainbow lizard (Harris, 1964), are rare. Signals of relative RHP, on the other hand, tend to be highly species-specific in that each species has its own form of "combat"; some forms, like the head charging of the bison, involve bodily contact whereas others, such as the gill erection of the Siamese fighting fish, do not, consisting entirely of an exchange of signals at a distance. Within these categories the signals are similar in general form but highly specific in detail.

4. *Different Effect on Allies.* The signalling of absolute and relative RHP can be further differentiated if we postulate the presence of an ally. Displays of absolute RHP *are* exchanged by allies, and they boost rather than lower their RHP. Signals of favourable relative RHP are *not* usually directed at allies (except in mock fights for practice) and, if they were, they would lower RHP.

Establishment of RHP. In man and other primates, RHP is probably established at adolescence, in fact the agenda of adolescence may be largely to determine RHP and group membership. Savin-Williams (1987) has described the spontaneous formation of social hierarchies in adolescent boys in a situation in which considerable efforts were made to encourage symmetrical relationships. The rough-and-tumble play of children, and the competitive tendency of adolescent boys, ensure a wide variation in RHP before the stage of adult fighting is reached, and it is likely that for each individual a basal level of RHP is determined at this stage, around which there is only a limited fluctuation in later life. We can expect genetic variation between, on the one hand, adult RHP which is independent of outside influences, and, on the other, RHP that depends for its maintenance on continuous boosting by what Fenichel called "narcissistic supplies" (Gaylin, 1983), and I later call anathetic signals.

As allies are an important determinant of RHP, and allies depend partly on popularity, which in turn depends partly on task competence, the result is likely to be a very complex interaction of the various sources of self-esteem, of which power over people (RHP) is one (Coopersmith, 1967). Those who emerge from adolescence as members of a social group may have within-group and between-group components to their RHP.

Catathetic Signals

Because "signal of favourable relative RHP" is a cumbersome phrase, and because there is no exact ethological equivalent, I propose the term catathetic to describe the signals that are exchanged during the engagement phase of the agonistic encounter (and at other times to reinforce dominance). Catathetic comes from the Greek words for "put" and "down", so expressing the function of catathetic signals, which is to put the other individual down, in the sense of making them yield and/or lowering their RHP. (I am aware that "cathairetic" would be more correct from the etymological point of view, but "catathetic" is easier to use).

It is worth noting that catathetic signals can be defined in relation to either the sender or the receiver. For the sender, they are signals of favourable relative RHP. For the receiver, they are signals that lower RHP. It may at first sight seem surprising that a technical term can be defined in two apparently independent ways; but, on reflection, it is of the essence of a signal that it should have a specific meaning for both sender and receiver. An S.O.S. message, for example, is a signal given when the sender is in distress, and it is also a signal that motivates the receiver to go to the rescue. The catathetic signal is given when the sender is confident of winning and, at the same time, it is a signal that lowers the receiver's confidence (RHP).

Are catathetic signals the only signals that lower RHP? In animals, probably yes. In human beings, because of speech, RHP may be lowered

by a message bringing bad news, such as the death or desertion of an ally; and this may be the reason why the bearer of bad tidings, although in no way responsible for the content of the message, may receive punishment at the hands of the recipient. As Shakespeare put it "The nature of bad news infects the teller" (*Anthony and Cleopatra*, Act I, Scene 2). Bad news is received, incorrectly, as a catathetic signal from the messenger, and so elicits a catathetic signal in return.

Considering the species-specificity and low information content of catethetic signals, it is likely that some very specific neural structures have co-evolved for the sending and receiving of these signals. Ethologists I have consulted are not happy to accept that catathetic signals are sign stimuli acting on an innate releasing mechanism to release the fixed action pattern of the yielding subroutine; but something similar to this classical ethological process seems likely.

Catathetic Signals in Humans. Human beings are unique in the animal kingdom in being able to verbalise the signal of favourable relative RHP (catathetic signal). The message of the signal is "I am superior to you", and whereas other species need to indulge in various pushing and pulling contests in order to get the message across, human beings can simply say it. Of course, if both say it, they are in a contest, and they have to keep on saying it until one gives up or escalates to the next stage, which is physical attack. Therefore, human ritual agonistic encounters take the form of slanging matches in which each contestant continues verbally to assert superiority over the other, with varying degrees of imagination and sophistication. This verbal interchange is the human species-specific form of catathetic signalling. As it appears to be generally true that the structures responsible for catathetic signals tend to become hypertrophied through sexual selection, the same argument must give one reason for the development of the richness of human language.

Human catathetic signals may consist of a simple, comparative statement (e.g., "I am cleverer than you"), or, rarely, a statement of the speaker's high RHP (boasting), but more usually it is a statement emphasising or implying the other's low RHP, such as criticism, sarcasm, insult, disparagement (of another and their allies), or even silence, implying "you are not worth speaking to". Escalated catathetic signals involve physical contact, such as hitting, scratching, biting, caning, flogging, etc. Catathetic signals are equivalent to the sociological concept of processual power (Kemper, 1978).

Raush, Barry, Hertel, & Swain, (1974) were able to elicit mutual catathetic signalling in married couples put in a situation of artificial conflict. When told to choose between a baseball match on T.V. and a programme on naming a baby, some couples discussed the matter rationally and came to a decision; some avoided conflict altogether; but a third group generalised the conflict into what was clearly a ritual agonistic encounter. In the third group, the verbal content typically included criticism of the spouse's mother, and complaints about ill-deeds committed many years ago; the content had a stereotyped quality and was reproduced on subsequent occasions.

McLean (1976) has used the term "microstressors" for repeated slight stresses such as the receipt of catathetic signals from one's spouse. He thinks these may be more important in causing depression than are large events. The sender was often unaware of the catathetic nature of the signals sent; for instance, the comment, "you'd feel much better if you didn't cry all the time", was intended as helpful and supportive but was received as criticism.

Down-hierarchy Catathetic Signals. The discussion so far has been concerned with the exchange of catathetic signals between individuals of equal rank. However, catathetic signals are also exchanged between individuals in asymmetrical relationships. They are usually directed from the dominant to the subordinate, and have the function of confirming and reinforcing the dominance. The classic example is the pecking of the domestic chicken, first described by Schjelderup-Ebbe (1935).

The sending of catathetic signals implies the calculation of relative RHP and, indeed, it must be the case that both dominant and subordinate continue to signal absolute RHP to each other. In particular, the dominant monitors the "RHP gap" to ensure that it remains sufficiently wide. When the gap is wide enough the signal of favourable relative RHP is inhibited, this inhibition being the main change that takes place in the winner of an encounter (see equation 4a in Price & Sloman, 1987). It is only when the gap is too narrow for comfort that more catathetic signals are sent to the subordinate to lower their RHP further, and so restore the gap to a satisfactory size. It is worth noting that in a complementary relationship the signal of favourable relative RHP carries the additional meaning of *insufficiently favourable* relative RHP. Thus catathetic signals will be sent down the hierarchy when the dominant feels that their RHP has fallen for any reason (such as getting depressed, or receiving catathetic signals from further up the hierarchy) or if they feel the subordinate's RHP has risen to an unacceptable level.

The usual strategy of the subordinate is to refrain from sending catathetic signals up the hierarchy and to signal low absolute RHP, which ensures that the dominant perceives a sufficient RHP gap. If catathetic signals are received from the dominant, the response is a *reduction* of the recipient's catathetic signals. This is the opposite of the increase that occurs in a symmetrical relationship (see equation 3b in Price & Sloman, 1987). This altered response to catathetic signals is the main change that characterises subordinate behaviour; it creates a negative-feedback loop, which confers

homeostatic properties on the relationship, and it would be consistent with an original analysis by Bateson (1972) to use it as the defining criterion of a complementary relationship (in contrast to a relationship that is less specifically asymmetrical). If the dominant can recognise this complementary response in the subordinate, it is a further source of reassurance about the stability of the relationship.

Sometimes the subordinate challenges the dominant and strives either for equality or for a reversal of the dominance, in which case catathetic signals may be directed up the hierarchy. The subordinate may also, without challenging the actual dominance itself, rebel against the degree of dominance exerted, so that an agonistic encounter occurs within the context of the complementary relationship. Schjelderup-Ebbe observed that such attempts at rebellion elicited very vigorous retaliatory pecking by the dominant bird.

Thus the subordinate suffers a baseline bombardment of catathetic signals from the dominant, and may suffer an increase in these signals either because of an attempt to rebel, or because the dominant is insecure for some reason. These down-hierarchy catathetic signals by definition lower the subordinate's RHP. If the drop in RHP of the subordinate exceeds certain limits, a yielding subroutine is triggered, leading to a further fall in RHP (analogous to the effect of a currency devaluation), in addition to changes described elsewhere (Price & Sloman, 1987). We called this a "confirmation" YS/RAB because it confirms an existing rank difference and thus subserves *social homeostasis*, in contrast to the "conversion" YS/RAB, which is associated with the conversion of a symmetrical to a complementary relationship, and the "reversal" YS/RAB, which is associated with reversal of rank—both of which subserve *social change*. The signalling characteristics of all three forms of YS/RAB are the same, except that the reversal YS/RAB also includes signals that disqualify former high rank in statements such as, "It was all a sham" and, "I did not deserve such respect, I was a fraud." Such statements may appear delusional and give rise to a label of psychotic depression; and it may be that these two types of YS/RAB, subserving, respectively, social homeostasis and social change, underly the clinical impression that neurotic and psychotic depression are distinct entities.

The subordinate also has subordinates, and does not signal to them low RHP in the form of inferiority or incapacity. This is why depressed mothers (and schoolteachers) are able to deal competently with children, particularly when no dominant adult is present. Moreover, the RHP gap between adults and children is usually so large that a depressive increase in down-hierarchy catathetic signalling is not likely to occur unless the teacher is in charge of a class of rebellious teenagers, or the mother has an excessively demanding child at home. In such cases, the adult may be

"strict" (catathetic) with the children, or there may be a rank reversal in which the depressed adult has a reversal YS/RAB superimposed on their confirmation YS/RAB, and then the depression is likely to snowball to an end-point, such as attempted suicide and/or hospitalisation.

It is an interesting fact that the quality of catathetic signals is similar whether they are directed to an equal, a subordinate or a dominant. It is the quantity that varies and that differentiates symmetry from asymmetry, and dominance from subordinacy. In fact, it is the relative quantity of catethetic signals that is used to *define* dominance in many studies; and it is the consistency over time of this relative quantity, and its correlation with other measures such as supplanting, precedence, and paying attention, that gave rise to the concept of dominance/subordinacy in the first place (Deag, 1977; Kaufmann, 1983; Richards, 1974); a concept that has stood the test of time in spite of a suggestion that it might be an artifact of captivity (Rowell, 1974).

Asymmetrical Catathetic Signals. At least in human beings, however, catathetic signals may differ in quality, depending on whether they are directed up or down a hierarchy. To take an extreme example, a pupil may be cheeky to a teacher, and a teacher may cane a pupil; but we cannot imagine the pupil caning the teacher or the teacher being cheeky to the pupil.

The down-hierarchy catathetic signal contains two messages at different logical levels. First of all it is a straightforward catathetic signal, which lowers RHP in the usual way. But, secondly, it contains the message, "I am in a position to give you a signal which is only given by dominant people to subordinate people." This higher level message is also catathetic and lowers RHP. Thus the pupil suffers loss of RHP both from the caning and from the fact of being caned.

Anathetic Signals. A contestant may give a signal of unfavourable relative RHP after the assessment stage of a ritual agonistic encounter, or at any time during the engagement stage, in an act of what is usually called submission. The signal may take one of three forms:

1. *A Comment on the Sender's Low RHP.* This may be, for example, running away, prostration or self-denigration.
2. *A Comment on Comparative RHP.* This can be said either in speech, as "You are greater than I", or in symbolic form. It is interesting that of the two main social asymmetries (parent/child and male/female), one has been adopted as a submission signal by canids and the other by monkeys.
3. *A Comment on the Receiver's High RHP.* Apart from deferential attention, this is hard to make except with speech. Given the power of speech, however, the possibilities are infinite.

How can these signals be defined with respect to the receiver? It would be tidy, and possibly not unreasonable, to suggest that they can be defined as signals that *raise* the RHP of the receiver. Then we could call them anathetic signals (from the Greek words for "put" and "up"), and note that they are in most ways opposite to catathetic signals (I will deal with an important exception later).

Asymmetrical Anathetic and Neutral Signals. Like catathetic signals, most anathetic signals are similar whether directed up or down-hierarchy; but, likewise, some are not, such as patronising behaviour (e.g., tipping). Equally, some RHP-neutral signals, such as the giving of orders related to the task in hand, may be asymmetrical; for instance, to give orders in a certain tone of voice may imply dominance.

It seems likely that the receipt of such an asymmetrical anathetic or neutral signal has a catathetic effect, in that it is a threat to the recipient's RHP and challenges their underlying dominance (or equality). Thus an asymmetrical anathetic signal boosts the recipient's RHP at one logical level and lowers it at another. The net effect may be to lower RHP and/or trigger a yielding subroutine.

A Case History. Although there has not been space to present case reports to illustrate the phenomena discussed here, it might be helpful to mention briefly a patient who came to me for treatment of depression whilst I was preparing this chapter, and who appeared to be an example of depression triggered by an asymmetrical anathetic signal. The patient had just had a baby, and lived near her mother-in-law, with whom she had a symmetrical relationship. After the birth of the baby, the mother-in-law tried to be helpful and took to coming into the patient's house frequently, without invitation, to help her with the baby. The patient sensed that this was an infringement of her territorial rights, such as a dominant person might claim, but because the mother-in-law was being so helpful, even with menial chores, she felt she could not complain. She became increasingly depressed, and the more incapacitated she became with depression, the more the mother-in-law came in to help, until she actually moved in altogether and slept in her daughter-in-law's house. With family therapy and a course of antidepressant drugs the patient recovered and was able to establish a satisfactory protocol for the mother-in-law's visits, and they ended up on the best of terms.

This case is informative in a number of ways. First of all, it is an example of depression triggered by behaviour that, in the patient's culture, was an asymmetrical anathetic signal; i.e., coming into the house to help without being invited. Secondly, it illustrates a case of "conversion" yielding subroutine-modelled depression, because it depended on the conversion of the symmetrical relationship between the patient and her mother-in-law to a complementary one in which the mother-in-law was dominant. Thirdly, it illustrates the positive-feedback nature of some depressions: the more depressed the patient got, the more her mother-in-law stayed; the more her mother-in-law stayed, the more depressed the patient got, until she nearly reached the end-point of suicide or hospitalisation. Finally, it illustrates the difficulty of assigning cause and effect in depression, because it could perfectly well be explained as an endogenous or puerperal depression, by which the mother-in-law was forced into a dominant role because of the depressive helplessness of the patient.

Defining the Relationship. Dominance is an elusive concept that is liable to infinite regression of the type, "I insist that you make the decisions", "I insist that you decide who makes the decisions", etc. (Hinde, 1979). The ultimate decision-maker is the one who defines the relationship, in the terminology of family therapy (Haley, 1963). This leads to some paradoxical effects. If one member of a pair (for example, the male) insists on equality, by this very insistence he is defining the relationship, making himself dominant, and excluding the possibility of equality. Even if he defines himself as subordinate, he is exercising the defining role, so that his statement is an anathetic signal on the surface but carries a catathetic message at a deeper logical level. This is probably why young people are reluctant to define what they should call older people, so that if, as often happens, the older person fails to give a lead, the younger person has no means of addressing the older directly.

An example of what may happen if a junior person takes the lead in defining the relationship is portrayed in a recent novel *The mission* by Robert Bolt (Penguin, 1986). The hero, being a subordinate member of a gang, defines himself as subordinate to the leader; a short time later the leader tries to kill him. This interaction reveals the author's perception of the catathetic nature of a definition of subordinacy.

The Components of RHP. In the discussion so far I have said that catathetic signals lower RHP. However, they clearly do not lower RHP in a substantive way, as it might be lowered by physical illness or the infliction of wounds. Often a catathetic signal is a comment on low RHP, such as "You are pathetic." Is there a difference between lowering RHP and commenting on low RHP?

Here we must remember that we are dealing with *ritual* agonistic behaviour. The catathetic signal achieves a ritual lowering of RHP, which is the ritual equivalent of the substantive lowering of RHP produced by wounds in non-ritual fighting. We can list the following components of RHP:

1. *Substantive RHP.* This includes size, strength, weapons, allies and other real resources. We can include here RHP secondary to group membership.

2. *Ritual RHP.* This is the RHP attributable to the ritual signals of others, and is increased by anathetic signals and reduced by catathetic signals.

3. *Endogenous or Thymic RHP.* It is part of the thesis argued here that RHP is lowered in YS/RAB-modelled depressive states (and raised in manic states). Manic patients behave as though they have excess of both substantive and ritual RHP, whereas depressed patients behave in the reverse way. Possibly one could speak of expanded RHP in mania and contracted RHP in depression. Contracted RHP would be equivalent to the "self-deceit downwards" of Hartung (in press).

Pain and Depression. The lowering of RHP by ritual catethetic signals appears to have been associated during evolution with a ritualisation of the pain sense (if one can talk of ritualisation in a sensory modality). Physical pain, which presumably first evolved to protect organisms from harmful non-social aspects of the environment, became ritualised in such a way that it is now experienced on the receipt of catathetic signals, such as a blow or a slap in the face; further ritualisation has led to the evolution of mental pain, which is experienced on the receipt of non-contact catathetic signals, such as criticism. The experience of depression is one of mental pain, and it may be that the prolonged and diffuse mental pain of depression evolved out of the brief and localised mental pain experienced on receipt of a non-contact catathetic signal.

THE YIELDING SUBROUTINE AND DEPRESSION

This part of the chapter is mainly about the signals given off in depression, and I hope to show that they are consistent with the instructions of the yielding subroutine model, and also similar to the signals of animals undergoing a yielding subroutine. But for the model to achieve any credibility, it is desirable to demonstrate that depression does in fact occur in situations in which one would anticipate a yielding subroutine (or at least explain why we do not expect it to occur in those situations).

Signals That Cause YS/RAB-Modelled Depression

There is not space here to give a discussion of the relevance of the large amount of work on "life events" (Paykel, 1978) and the social origins of depression (Brown & Harris, 1978), but I would like to say a word about the relation between phylogenetic and ontogenetic causation.

A number of theorists have tried to account for the existence of depression by postulating adaptive value in the form of disengagement from goals and incentives (Klinger, 1975). If a goal is unrealistic or unattainable, failure to achieve it is followed by depression, with loss of

interest and associated detachment from the goal. The individual is then free to pursue a more realistic goal. The problem with this theory is the *pervasiveness* of depression, in that interest is withdrawn not only from the goal that is unattainable but also from all other alternative goals. Moreover, the poor concentration and impaired decision-making of depression are hardly likely to help in selecting an alternative goal. Classically as in Shakespeare's *Hamlet*, the problems of life induce a depression that takes away the capacity to deal with the problems.

Let us consider the case of our hunter–gatherer ancestor. If a man's hunting is going badly, he should devote more resources to gathering. What is required is a disillusionment with hunting that does not affect enthusiasm for gathering. But depression as a response to goal-non-attainment is pervasive and leaves him lacking all enthusiasm, so that he is unlikely to switch to gathering.

The solution to this problem lies in focusing up from the individual to the level of the small family group. Depression is pervasive and therefore cannot subserve switching from one goal to another within the same individual, but the pervasiveness does not extend to other group members and, therefore, it is likely to be an effective means by which a group can switch its goal from that espoused by one member to that espoused by another. If the hunter's brother is keen on gathering, depression in the hunter would reduce his status and authority in the family and allow the brother to have his way. The group would devote themselves to gathering and the brother would assume the role of leader. The cause of the hunter's depression might well be seen by the hunter and his family as his failure in hunting, but the adaptive value would be the yielding of authority to another. There would be no adaptive value in the depression if the hunter were acting entirely on his own, or if other contenders for power in the group were equally devoted to hunting.

The two competing goals of hunting and gathering espoused by the two group members would be elements in the "concept pool", which Hill (1984) has proposed as the raw material of socio-cultural selection, and the survival of one goal rather than another is associated with the distribution and redistribution of prestige between group members.

Depression Subserving Social Change. We (Sloman & Price, 1987) reported the case of a farmer who became depressed because his milking herd was doing badly. During his depression he sold his herd and virtually handed over his farm to his son, who was strongly opposed to milking and wanted to raise beef cattle. Treatment was directed at defusing the confrontation with his son by getting him formally to delegate the running of the farm to the son, and by encouraging him to invest his self-esteem in his hobby of showing pedigree dogs. At the time they came for treatment the farmer could have been said to be undergoing a "reversal" yielding

subroutine, and he was in danger of becoming permanently subordinate, in the role of a hypochondriac, to his son; with treatment they were able to achieve a symmetrical relationship (thanks to the division of territorial interest). Our farmer was in the position of the hunter whose hunting was going badly, and the son in the position of the brother who was keen on gathering. Although the adaptive value was in the reversal of rank between the two, the apparent cause of the depression was the failure of the milking herd; the father never realised that he was in serious conflict with the son. According to our hypothesis, the critical life event is not the failure to attain the goal, but the failure to attain the goal in the presence of a competing individual who espouses an alternative goal. This hypothesis is testable; for instance, it predicts that if the farmer had had no son he would not have become depressed.

In the previous section I mentioned a case in which depression had been precipitated by an asymmetrical anathetic signal. I can also report a case in which depression appeared to be precipitated in a young lady by an offer of marriage. The young man, who was a very forceful person, realised that his prospective fiancée was a strong feminist, and included in his proposal an *insistence that they should have a totally equal relationship*. Neither of them realised that this proposed definition of the relationship was an asymmetrical signal with catathetic effect, and the lady's depression was complicated by (although not caused by) the double bind of being made equal at one logical level but subordinate at another. I should like to be able to report that with therapy she administered a counter double bind by insisting that, on the contrary, she would prefer to have a subordinate role in the relationship (and thus by redefining the relationship making a bid for the dominant role), but in fact, she broke off the relationship.

Depression Subserving Social Homeostasis. Depression due to being chronically bullied by a dominant person is also difficult to measure exactly, but is probably more familiar both to psychiatrists and general practitioners. Rippere and Williams (1985) give some examples of depression due to aggravation by superiors at work. From the Adlerian school, von Andics (1947) described a series of women who committed suicide because of "mortification at being abused and humiliated". McLean (1976) has described depression occurring as a result of the "microstressors" of married life, and it is common in clinical practice to see a subordinate spouse with chronic depression and low self-esteem that appears to be due to a constant barrage of disparagement by the marital partner. These spouses, usually but not always wives, are in the situation of the low-ranking birds described in the next section, and the epithet "hen-pecked" is applied with good reason. They are in a situation similar to dogs with "learned helplessness" (Seligman, 1975) in that they suffer random noxious stimulation over which they have no control; and they are in what

Gardner (1982, and this volume) has called an in-group omega psalic. Sometimes they appear to undergo an actual depressive episode due to a particularly severe bout of abuse, either because the dominant spouse is being bullied in another relationship and is "redirecting the aggression", or because the patient has made a bid for equality or freedom and is being punished for the rebellion, and then they appear to have one "confirmation" yielding subroutine superimposed on another. The depressed spouse is "stuck" in the unhappy marriage, too lacking in energy to make a bid for independence, too lacking in interest to contemplate another partner. Therapy is difficult because any improvement tends to lead to fighting back or attempts to escape, either of which leads in turn to further punishment by the dominant spouse.

The Depressed Bird. It seems likely that birds and mammals both inherited agonistic behaviour directly from our common reptilian ancestor, whereas affiliative behaviour in birds developed quite independently. Therefore we can detect the agonistic signals of birds and empathise with them, whereas we cannot empathise with bird affiliative behaviour (what little they show between members of the same sex) in the way that we can empathise with the signals given by two chimpanzees being reconciled with each other after a fight.

Although separated by 100 million years of independent evolution in each lineage, we as human beings can be intimidated by the threat stare of a bird of prey, and we can feel a mixture of pity and contempt for the "hen-pecked" barnyard fowl. Schjelderup-Ebbe (1935), who was the first to describe in vertebrates a social hierarchy based on individual recognition, reported a mild, chronic depression in birds of low rank and a severe, self-limiting depression in birds falling in rank. He described the difference in countenance and behaviour between high-ranking and low-ranking birds in the following terms: whereas the face of the superior bird would "radiate with joy of satisfied pecking-lust", the subordinate had "a much less enjoyable and anxious existence", and if it tried to revolt against the despot, the subordinate "fights with less display of energy than usual. It seems as if the spirit of the bird were dulled by a premonition of hopelessness" (p. 955). When the high-ranking bird falls in rank "its behaviour becomes entirely changed. Deeply depressed in spirit, humble, with drooping wings and head in the dust, it is—at any rate, directly upon being vanquished—overcome with paralysis, although one cannot detect any physical injury. The bird's resistance now seems broken, and in some cases the effects of the psychological condition are so strong that the bird sooner or later comes to grief. This is especially true if the bird has been absolute ruler for a long time, and the reaction has been, therefore, most complete. In most cases, however, time heals the disappointment and the bird becomes used to its new position" p. 966.

Language Problems. Subsequent accounts of mood in animals have been less vivid, no doubt due to an aversion to anthropomorphism, and also, I suspect, to a lack of suitable terminology. For this reason I have extended the previous use of the term RHP and introduced the terms catathetic and anathetic. It is unsatisfactory to call the hostile interaction between husband and wife "threat display" or "pecking", and equally unsatisfactory to call the pecking of the subordinate by the dominant bird "nagging", but to call both phenomena catathetic signals enables us to describe them with the same conceptual system. It is more satisfactory to borrow animal terms for use in man, hence the use of RHP: it is easier to think of RHP in man than of ego strength in animals. I have followed the advice of Bandura (1983) in trying to avoid the use of "aggression" altogether.

Of course, there is no point in trying to use the same conceptual system for animals and man if there is merely analogy based on convergent evolution. But it seems quite possible, and is certainly heuristic, to think that RAB and its associated yielding subroutine have been such a fundamental part of vertebrate social life than they have continued relatively unchanged since we divided from present-day reptiles and birds, and that the underlying structures and processes are homologous (see Chapter 8).

In regard to the value of animal data for human psychology, it would have been quite impossible to formulate the present hypothesis relating depression to RAB without the extensive ethological data about RAB. Ritual agonistic behaviour is such an extraordinary and unlikely phenomenon that, without the knowledge that it is an ubiquitous and fundamental vertebrate characteristic, the evidence of RAB in man, overlaid as it is with inherited affiliative systems and culture, would probably have been ignored, or considered a trivial matter of no evolutionary significance. And even if the hypothesis should turn out to be wrong, it would be hard to maintain that it was not worth formulating. Totman (1985) said that there is nothing new in social psychology because there are no investigative tools that have not been available in at least rudimentary form since ancient times; but the data of comparative ethology constitute just such a new, investigative, conceptual tool for human psychology.

Yielding Signals Given by the Depressed Patient

The yielding hypothesis predicts that the following changes in signalling should be observed in depressed patients:

1. A reduction of catathetic signals (hostility) directed towards dominant people and towards those equals who are regarded as competitors.
2. An increase in catathetic signals (hostility) to subordinate individuals. This prediction was derived from the application of the yielding subroutine instructions to the mutual pecking equations of our bird/mathematical model (Price & Sloman, 1987).
3. An increase in anathetic signals (adulation) to dominant people.
4. A reduction in anathetic signals (morale-boosting) to subordinate people, such as children.
5. Signalling of lowered absolute RHP.
6. Demonstration of altered responsiveness to the receipt of catathetic signals.
7. Depressed patients should share some signalling characteristics with animals who have been defeated and/or occupy low rank.

Catathetic Signals (Hostility) in Depression. Although the association of rage and hatred with depression received comment from early psychoanalytical writers (described by Gaylin, 1983), studies of depressed patients in hospital found that aggression (hostility) is profoundly inhibited. However, closer investigation of less severely depressed patients has led to very conflicting results (Cochrane & Nielson, 1977; Snaith & Taylor, 1985).

In the enormous literature on hostility in depression, two main dimensions of variation are recognised. One concerns the direction of the hostility, whether it is directed to other people (or things) or to the self; the other dimension is concerned with whether or not the hostility is expressed to its object (as opposed to being reported to the psychiatrist or investigator). Catathetic signals are equivalent to hostility expressed outwards. Our hypothesis predicts that expressed hostility to higher ranking persons will be reduced in depression. The same should apply to equal-ranking people who are perceived as competitors. Hostility to lower ranking persons, on the other hand, is predicted to be increased by the onset of a depressive episode (Price & Sloman, 1987).

One study gives some information relevant to this latter prediction. Weissman and Paykel (1974) found that depressed women expressed more hostility to intimates and less hostility to non-intimates than a control group. As the intimates were often children, and children usually rank below their mothers, the result tends to support our hypothesis.

Our own study (Price & Sloman, Note 1) attempted to test the hypothesis on a sample of married couples, one of whom had presented as a depressed patient. We rated them on two variables, husband dominant/wife dominant, and hostility to spouse increased/reduced by the depression. We predicted that when it was the dominant spouse who was the depressed patient the hostility expressed to the partner would be increased and *vice versa*. In spite of relatively small numbers and considerable difficulty in measuring both variables, the results were in line with the hypothesis and nearly reached the 5% level of significance.

It is an interesting sidelight on the lack of ethological contribution to

psychiatric research that, of all the many studies which have been conducted in this field, not a single one (apart from our own) has measured whether the hostility is directed at a higher- or lower-ranking person, nor has the desirability or possibility of such a measurement been discussed.

Anathetic Signals (Adulation) in Depression. The depressed patient does not produce the elaborate signal of submission that is sometimes directed at a specific high-ranking individual, such as the flattering speech of eulogy associated with avowals of allegiance, and this is at first sight surprising as we should expect depressed people to do all they can to reassure those in power of their desire to serve and not to challenge. This is probably because the depressive signal is using a much more primitive channel of communication, one which cannot be falsified as can the flowery speech, and therefore likely to be more fundamentally reassuring. Even more to the point, the flowery speech requires social skill, a component of RHP, and therefore the presentation of a flowery speech indicates the presence of the resources needed for a come-back. But the absence of a flowery speech when one might be expected, or some nervous mumblings of a self-absorbed and depressive nature, would serve to demonstrate lack of social skill. This presentation of the incapacitated self would not be received as a signal but as a signal about a signal, a metacommunication to the effect that the signaller lacks the capacity to communicate appropriately.

The same would apply to the impairment of attention in the depressed patient. The good subordinate should always be attending to the dominant, giving what Callan (1976) has called "advertence". The depressed patient is signalling, "I am too incapacitated to give you the normal politeness of my attention."

In general, we may say that by failing to give elaborate and skilled signals of submission the depressed patient is submitting at a different logical level (Watzlawick et al., 1967); saying, "I am so incapacitated by my submissive state that I am not even able to submit properly."

Being signals of unfavourable *relative* RHP, anathetic signals also include self-denigration, and this form of anathetic signal *is* given in depression. As predicted, it is given to dominant people and not to equal or subordinate people, and this may explain the common, clinical observation of in-patients who express strongly depressive ideas to the consultant in the ward round but give no sign of depression to fellow patients on the ward or to nursing staff (and whom nursing staff tend to think are hoodwinking the consultant in order to escape being discharged). Self-denigration is not a skilled task and does not betray the general impression of incapacity.

The various forms of down-hierarchy anathetic signalling, such as morale-boosting and encouragement of children and other subordinates, are reduced in depression; the depressive has no energy to spare for making others feel better.

Signal of Low RHP in the Co-operative Mode. Chance (1986) distinguishes between social behaviour in which ritual agonistic behaviour (RAB) is occurring and the agonic mode in which group members are prepared for RAB even though no actual RAB is taking place. For convenience I will call both these modes the competitive mode, and contrast it with the co-operative mode in which competitive within-group differences are forgotten and the pair or group is able to concentrate on other things. In the co-operative mode are included Chance's hedonic mode, in which the group is egalitarian and oriented towards affectionate interaction, and other states in which the group is engaged in performing a task, in recreation, or in competing against another group. In these latter groups there may be an underlying hierarchy which has been established in the competitive mode, or some other form of underlying social asymmetry; but, by definition, any such asymmetry is not being contested in the co-operative mode.

If an asymmetry such as leadership is contested, the group has switched to the competitive mode—to the agonistic mode if the contest is open, to the agonic mode if the contest is unspoken. After a bout of RAB there may be a rapid switch back to the co-operative mode, particularly if the outcome of the RAB is accepted by all parties; this process is well illustrated by de Waal's chimpanzee group, in which there is active reconciliation after a contest, albeit the reconciliation may be conditional on submissive behaviour by the loser. If the skirmish has been light, the submission may be entirely voluntary, but if it has been intense and prolonged, and particularly if there has been a change of leadership, the loser may undergo a yielding subroutine (YS) and suffer a prolonged period of incapacity. The YS of the deposed leader (a male, for the sake of argument) allows the RAB to be concluded, and allows the other group members to return to the co-operative mode. The deposed leader himself, however, cannot return to the co-operative mode because the YS is a component of RAB. He therefore continues his submissive form of RAB, which may well appear inappropriate in the task or recreational setting of the co-operative mode, and he is not likely to concentrate on the task or enjoy the recreation with the other group members. The function of his behaviour is to reassure the new leader that he is not likely to make a come-back, thus permitting the group to remain in the co-operative mode. This is achieved by the symptoms of depression, which make the deposed leader appear "not his old self" and to have lost former leadership qualities such as initiative, decisiveness and attractiveness. The capacity for obeying orders and carrying out routine tasks is less impaired in depression.

A YS may occur in the leader while the group is in the co-operative mode, for instance after a bereavement or other loss of RHP. In that case the leader is likely to stand down from the leadership voluntarily, if there is

any competition for the role, and the group as a whole is thereby saved from a switch into the competitive mode. It is unlikely that any of the group members will have insight into the reason for the change of leadership, which is likely to be attributed to some incidental cause like old age or ill health.

Altered Response to Catathetic Signals. What is likely to give great reassurance to a dominant person is to recognise the altered dynamic whereby their catathetic signals no longer elicit catathetic signals from the other, but rather a reduction in catathetic signals or the equivalent, in the form of an increase in anathetic signals; so that their assertions are no longer met with "Yes, but . . .", or other forms of answering back, but, with agreement. "A soft answer turneth away wrath" (Proverbs 15: 1).

Similarity to Defeated or Low-ranking Animals. There are certain characteristics of posture, gait and gaze that occur generally in low-ranking birds and mammals, and these features are found in depressed patients (Adams, 1980). The posture of the depressed patient tends to be bowed or hunched, appropriate to submission. The gait lacks "jauntiness" and resembles that seen in low-ranking animals. Eye contact is reduced both in depressed patients and those in whom depressed mood is experimentally induced (Kleinke, 1986), particularly if the interlocutor is seen as hostile.

Previous Theories of the Depressive Signal. The most common function suggested for the depressive signal is recruitment of support or a "cry for help" such as Salvador Rado's "great despairing cry for love" (Gaylin, 1983). However, this hypothesis is confusing because of the different meaning of "support" in the two modes. In the competitive mode, recruitment of support means the enlisting of allies or subordinates to challenge a dominant individual or group, and this kind of activity is profoundly inhibited in depression. In the co-operative mode, support usually means nurturance or care given to a weaker or needy person, and the elicitation of this kind of support by "care-eliciting behaviour" (Henderson, 1974) would not conflict with the yielding function of depression, although Klerman (1974) found that depression, if at all prolonged, tended to alienate rather than recruit the support of husbands and other family members for a series of depressed women. McLean (1976) expressed this in behavioural terms: "Depressed people are usually not reinforcing to be with and consequently are often tactfully avoided." (p. 313)

If, as I suggest, the depressive signal evolved as a yielding signal, its functional relevance is to the competitive mode, and when it is received in the hedonic mode its meaning is likely to be obscure. This obscurity is likely to be the usual state of affairs, as human beings spend the great majority of their time in the co-operative mode, either engaged in a task or enjoying recreation; and this is even more the case in the medical setting, when they are receiving help. It is not surprising, therefore, that various

psychiatric observers have disagreed about the meaning of the depressive signal, and some have concluded that it has no meaning at all (Klerman, 1974).

Some Problems for the Theory

The Use of Depressive Symptoms to Get One's Own Way. According to the yielding model, depression is a primitive means of not getting one's own way. And yet sometimes depressed patients seem to get their own way by the very fact of being depressed. For instance, a wife may complain to her husband that she is too depressed to visit his parents. Hooper, Vaughan, Hinchcliffe, & Roberts (1978) even go as far as to say that "it is possible to see the whole depressive stance as a massive attempt to exercise control over the marital relationship".

I think here the depressed patient is slipping into the role of support seeker (Heard and Lake, 1986), and taking advantage of the parental, nurturing instincts of the other, much as children manipulate their parents by crying. Like any other symptoms, depressive symptoms can be manipulated for "secondary gain".

In the case of relations between patient and therapist, patients are expected to let the therapist get his own way, and it is a matter for comment if they do not. Freud said (Gaylin, 1983) about depressed patients, "They are far from evincing towards those around them the attitude of humility and submission that alone would befit such worthless persons; on the contrary, they give a great deal of trouble, perpetually taking offence and behaving as if they had been treated with great injustice." It is not impossible that these troublesome patients of Freud's were high-ranking Viennese who saw themselves as socially superior to their analyst, and therefore their catathetic signalling to him would have been increased rather than reduced.

Ritual Agonistic Behaviour (RAB) in Females. RAB is so much more conspicuous in males than in females that, in his classification of aggressive behaviour, Moyer (1976) labelled it "inter-male aggression". How can this be reconciled with the hypothesis that depression, which is more common in females, evolved from the yielding component of RAB?

1. *Female-female RAB.* Since Moyer's time it has become recognised that RAB between females is important in many species (Kevles, 1986) and affects the reproduction of low-ranking females in a number of ways, such as prevention of copulation, suppression of ovulation, inhibition of implantation, abortion and infanticide. The method of fighting may not be as dramatic as between males, but that is no reason why the yielding should be any less effective.

2. *Dependent Rank.* In primate society female rank is more variable

than that of males and therefore the mechanism for falling in rank needs to be more easily triggered. Females tend to enjoy rank that is dependent on that of the male they are consorting with, and if the consort relationship is dependent on the presence of oestrus, there may be a rise and fall of rank with each sexual cycle. In polygynous species the females have to cope with both within-harem and between-harem variation of rank.

3. *Formal rank.* In human society, occasions for contesting male rank are limited. In situations in which confict between males is likely to arise, formal ranks are allocated and differences are settled by outside adjudication, so that the interpersonal settlement of conflict by RAB is not required. In the armed forces, for example, the formal hierarchy of males gives rise to less problems than the less well-defined hierarchy of wives. Fall in formal rank is rare, and even when demotion does occur, as with retirement, the individual concerned seldom remains in the same social group as those who have been allocated his former rank.

4. *Male-female RAB.* Competition between males and females has become common in Western society (Weisfeld, 1986), and it occurs in its most intense form in the marital relationship. Dominance in the marital relationship increases genetic fitness because it allows control over extra-marital conception, and over the allocation of resources to collateral relatives and to children not shared with the spouse.

It is not known what proportion of marriages are symmetrical, but we know from clinical experience that switches into asymmetry, and reversal of asymmetry, are not uncommon. We also know that down-hierarchy catathetic signalling is a common cause of depression in subordinate spouses. McLean (1976) has recorded this phenomenon, which consists in some cases of an almost continuous stream of criticism and abuse, and he made the interesting discovery that much of what is received as catathetic signalling is not consciously transmitted as such. It is probably true to say that more RAB occurs within marriage than anywhere else in human society.

Doubts have been raised about the reliability of dominance relations in marriage. Various measures of dominance are poorly correlated (Grey-Little and Burks, 1983). These experimental results are at variance with everyday observation, our professional experience, and with what we know of human life through fiction (see, for instance, the marital relationship depicted by Daphne de Maurier in *Jamaica Inn*).

I think the answer to this problem lies in the distortion introduced by an investigator. If a couple is asked which is dominant, their answers are not objective statements but may be part of their marital struggle, because to make a statement about whether or not one is dominant may affect one's dominance. It is necessary to ask people outside the marriage questions about where the power lies, and preferably to ask informants who rank

lower in the hierarchy than the two individuals whose relative rank is in question, because the fine gradations of hierarchical rank are more visible from below. In clinical work, for instance, the replies of patients and their spouses to questions about dominance are very evasive, but asked about the power relations in their parents' marriages, they can give immediate and definite opinions.

5. *Reverted escape.* In many primate species the males move freely from group to group, and can thus escape from a disputed dominance relationship. Females tend to stay in the same group, and therefore must contest each conflict about rank with the risk of being forced into the role of yielder. In marriage, wives more than husbands feel trapped by the need of their children for a home and a parent of the opposite sex.

Depression After "Exit" Events. It is a matter of common clinical experience, and has been confirmed by careful research (Paykel, 1978) that depression frequently follows the loss of a loved person, whether by death, or rejection, or in some other manner. On the face of it the present hypothesis would suggest the opposite, because the exit of a group member offers an opportunity for rise in rank, as often happens when a parent dies; whereas the entry of a new group member threatens loss of rank. Therefore depression should be more common following "entry" events.

I suggest that the answer to this apparent problem lies in the fact that, in man and other social primates, rank depends largely on alliances. Therefore the loss of a loved one has profound implications for the rank of the bereaved individual. This is seen most conspicuously in widows, in whom, in some social groups, there is an obligatory submission to the wife of the eldest son. Or, again, a son who maintains his dominance over his brother because of his father's support may fall below his brother in rank after his father's death.

Depression has no adaptive value in the activities of the co-operative mode. When a group member dies, there is more work to be done by the survivors and decisions about reallocation of work and social roles have to be made, so that an increase in energy and decisiveness (superimposed on normal grief), rather than depression in the bereaved individuals, would be adaptive. But depression is adaptive according to the agenda of the underlying (but often unacknowledged) competitive mode, effecting a reduction in RHP of those individuals who have been supported by the lost person, and tailoring their dominance level to the new social situation.

Modification of RAB in Human Beings

Since the neural circuits for ritual agonistic behaviour (RAB) were laid down in our ancestors' reptilian brains, much further evolution has occurred. In particular, we have developed parental behaviour, pair-bonding

and the capacity for affiliation between members of the same sex which allows for co-operative behaviour including alliance formation. Superimposed on these evolutionary developments there is the pervasive influence of culture. It is not surprising, therefore, that human RAB is somewhat different from the lizard's.

Cultural Organisation of Competition. Most areas of human competition are now prescribed by culture. RAB has been either modified or replaced by tournaments, duels, sporting contests, legal actions, gambling, examinations, selection panels and elections. RAB is competition for territory or status as guarantees of access to resources, but most human competition is for money, which can buy not only resources but also territory and status. Referees and law enforcement agencies ensure that losers lose, and there is no need for the yielding subroutine (YS) in these culturally ritualised contests. The primitive yielding of the YS is only required now in societies that are above the law (such as oligarchies), or below the law (such as street gangs), or beyond the law (such as the pioneers of the wild west), or deliberately ignored by the law (such as marriage and the family). In practice, therefore, and certainly in medical practice, RAB and its complications are encountered largely in marriage and the family, and in other areas in which society decrees that competition should not be taking place.

Language. Language enormously increases the scope for catathetic signalling, such as veiled criticism, sarcasm and the subtle induction of shame and guilt. Moreover, it allows people to put each other down without the recipient being aware of what is happening. I have already mentioned unilateral definitions of relationship and the use of asymmetrical neutral and anathetic signals; there is also constructive criticism, in which an attack on a person's ritual RHP is presented as an attempt to improve them. These are all technically double binds (Bateson, 1972) in which a signal appears neutral or anathetic but is catathetic at a different logical level. Individuals who experience these paradoxical put-downs during their formative years are likely to anticipate catathetic experiences even in co-operative settings, and will probably prefer situations in which the co-operative mode is definite such as a group task or inter-group conflict, rather than ambiguous activities such as "small talk".

Disparagement of an individual to a third party, an extension of catathetic signalling impossible in pre-linguistic societies, is beyond the scope of this discussion.

Alliance formation. In any current agonistic concern or rivalry, other people are likely to be either for one or against one. Therefore in our appraisal of others there will be a tag of "for," or "against" in addition to the rating of relative RHP. Those "for" increase our RHP and those

"against" reduce it, particularly if they are higher ranking. This fits in with the fact that socially anxious people are improved by the presence of some higher-ranking people, but made worse by others.

In the case of subordinates, alliances set a limit to catathesis. Among reptiles there is no limit to the amount of catathetic influence which it pays one animal to exert on another, apart from the effort of doing so, for that other is never going to be of any use to them. But if a conspecific is, or is likely to become, an ally there *is* a limit to how put-down we want them to feel. We want them to be sufficiently depressed not to challenge us, but we do not want them to be too depressed to help us challenge someone else, or to help us ward off someone else's challenge. And so we adjust their mood carefully, by putting them down with catathetic signals and lifting them up with anathetic signals until their mood is such that they lack the initiative to fight on their own behalf but do not lack the confidence to fight on our behalf, given sufficient encouragement or coercion.

I mentioned above that the expression of hostility appears to be inhibited in depressive states, but it would be more true to say that it is hostile *initiative* that is inhibited, and that does not include bullying aggression towards lower-ranking individuals or aggression carried out on behalf of someone else (particularly on behalf of a higher-ranking person). In fact, there are occasions when a patient may be too depressed *not* to fight; for instance, a hen-pecked husband who is coerced by his wife to join her affray with a neighbour and to make a complaint to the neighbour's husband, and who, if he were less depressed, would firmly tell his wife that she must sort out her own quarrel.

Parent–Child Relations. Children may manipulate their parents' instincts subtly in order to get their own way (see above), but they may also confront them in a manner similar to a ritual agonistic encounter, but with an asymmetrical use of methods. For instance, a baby may have a series of encounters with its mother over its feeding schedule in which the baby cries and the mother uses different methods. If the baby wins this battle, it may become dominant to its mother, and it could be that this loss of control in the mother might precipitate a yielding subroutine which would be recognised as a post-natal depression.

However that may be, it is certain that the use of childish forms of both manipulation and confrontation occur in marital struggles to further complicate an already complex situation.

Pair Bonding. The human species appears to be the only mammal in which more than one pair forms bonds in a cohesive group. It is also unique in that parents have an influence over their children's bonding, and some parents may express their social aspirations in this way rather than in direct competition with other adults.

Inter-Group Conflict. Human social life is like a series of concentric circles, extending to ever more distant relationships. In one circle there is usually conflict, with co-operation in the circle immediately inside it. At some degree of social distance, probably around the stage at which people cease to know each other individually, RAB ceases to occur and gives place to warfare. The relation of the motivational bases of RAB and warfare is obscure; warfare does not appear to have evolved out of RAB, but the waging of war probably inhibits RAB in a group more than other forms of group task.

Anathesis. The capacity to boost other people's morale (raise their RHP) evolved after the mechanism for RAB had been laid down. Anathesis may have evolved out of parental behaviour, or possibly out of pair-bonding, or it could have evolved out of submission, one of the components of submission being the ritual acknowledgement of the other's higher RHP (see above). In the latter case, it may be that the reptilian brain treats anathetic signals as if they were negative catathetic signals, and the cessation of anathetic signals as catathetic signals. This would explain the mechanism for the precipitation of a yielding subroutine by loss or separation from a loved one (source of anathetic signals). But a catathetic signal contains a dominance vector: when it comes from a *subordinate* (or equal) it elicits a catathetic signal in return, and if it is overpowering it triggers a yielding subroutine of the change variety, the template for psychotic depression; a catathetic signal from a *superior* elicits a reduction of catathetic signals or an increase in anathetic signals, and if it is overpowering it triggers a yielding subroutine of the homeostasis variety, the template for neurotic depression. Now, if anathetic signals reach the reptilian brain with a dominance vector, and if this vector is maintained when their cessation is recognised as a catathetic signal, it follows that the loss of a lower-ranking source of anathesis should elicit hostility, possibly followed by a psychotic form of depression, whereas loss of a higher-ranking source of anathesis should cause an inhibition of hostility, possibly followed by a neurotic form of depression. It is recognised that most bereavement reactions are a confused mixture of hostility and depression (Parkes, 1986), but so far there has been no attempt to relate the balance of these affects or the type of the depression to the relative rank of lost person and bereaved individual.

Conclusion. In spite of culture, language and the evolution of various forms of affiliation, many human agonistic encounters are remarkably similar to those of lizards. Most married people have experienced pointless rows in which neither culture nor the higher centres of the brain seem to play much part. There are more formal similarities, such as the Yanomamo chest punching in which rivals take alternate turns, not unlike the alternate striking of the opponent's head with the tail by lizards, or the alternate broadside presentation of Siamese fighting fish. In addition to these primitive encounters, the process of RAB affects us at other times, when RHP may be raised or lowered in an apparently non-competitive setting. This is an area where more research is needed. For instance, are the RHP-comparing mechanisms inhibited when the group is operating in the co-operative mode, or are they still active below the level of awareness?

The Negotiation of Asymmetry in Human Society

It is clear from work summarised elsewhere in this volume that human beings can exist for long periods in a state of social symmetry—and that this is true both for peaceful people, such as the Kalahari bushmen, and aggressive people, such as the Yanomamo—provided there is plenty of space for conflicts to be managed by group splitting (freedom from circumscription). There are three main ways in which relationships may lose symmetry:

1. *Verbally Negotiated Asymmetry.* Two formerly equal people may enter a negotiation whereby one becomes the master and the other the servant, or a group may elect one person leader, etc.
2. *Agonistic asymmetry.* As a result of an agonistic encounter one individual adopts a subordinate role and acknowledges their lower RHP. If the two started with equal RHP, the RHP of the loser falls as part of the yielding subroutine.
3. *Adulatory asymmetry.* As a result of some social process which may take the form of a display of adulation-eliciting behaviour, one individual comes to respect, love, hero-worship or otherwise adulate the other. The adulator revises upwards his estimate of the other's RHP.

Agonistic and adulatory asymmetry both involve the creation of an RHP gap between two individuals, in both cases the RHP adjustment occurs in the one who finally has the lower RHP, and in both cases the adjustment of RHP is associated with an emotional state (depression in the case of lowering own RHP, adulatory emotion in the case of raising one's estimate of other's RHP). The main difference is in the quality of the emotion experienced by the adjuster, and it would not be an exaggeration to say that of the two sets of instructions for inducing asymmetry, the adulatory subroutine is more "user-friendly" than the yielding subroutine.

Adulatory asymmetry is maintained by the passage of anathetic messages from the adulator to the object of adulation, so that the object's RHP is ritually raised to match the inflated estimate of the adulator. However, adulatory asymmetry is fundamentally unstable. As Kemper (1978) has pointed out, the object of adulation may become dependent on the

anathetic signals (processual status) of the adulator to maintain his RHP (structural power), and so is vulnerable to their withdrawal. This is a weapon in the hands of the adulator, which paradoxically increases their own RHP, so that the balance of RHP (structural power) may end up in favour of the adulator. The object can avoid this situation in a number of ways: by using catathetic or asymmetrical signals to put the adulator down; by recruiting more than one adulator, so that the object is not dependent on anathetic signals from any one individual; and by matching the adulator's new power by recriprocating their anathetic signals. However, we should note that, whereas the anathetic signals of the adulator correspond to the up-hierarchy anathetic signals of the agonistic mode, in that they are signals of unfavourable relative RHP, the reciprocal anathetic signals directed down-hierarchy to the adulator cannot be defined in this way.

The complexity of social life depends on the interplay of these asymmetries, in that a group which is ostensibly egalitarian may be affected by all three forms of asymmetry at different times, or even at the same time. There are definite correspondences between the roles and processes of the different asymmetries. For instance, the individual who is dominant in the competitive mode is likely to be the object of adulation in the co-operative mode, adopting the role of support-giver, employer or elected leader. On the other hand, this may not be the case; for instance, a group may elect a non-dominant leader in order to avoid the domination of the one who is dominant in the competitive mode.

SUMMARY

Within the framework of evolutionary biology, human depressive states are postulated to have evolved as the yielding component of ritual agonistic behaviour (RAB), which is the main vertebrate mechanism generating social asymmetry (subserving the intra-sexual component of Darwin's sexual selection). Two related but distinct yielding subroutines are postulated. One subserves social *homeostasis* in the form of maintenance of low rank in spite of motivation to rise in rank, and is a chronic and relatively mild condition that may provide a phylogenetic template for *neurotic depression*; it is similar to Seligman's model of learned helplessness (Seligman, 1975). The other yielding subroutine subserves social *change* in the form of fall in rank, and is a severe but self-limiting condition that may provide a phylogenetic template for *psychotic depression*; it is related to Klinger's model of depression as a means of disengaging from unattainable goals and incentives (Klinger, 1975).

The ritual agonistic encounter is analysed in terms of signalling of resource-holding potential (RHP), a term derived from behavioural ecology (Parker, 1974). Two stages of the encounter are distinguished. The first, which constitutes the *assessment* stage of the encounter, is a mutual offer of information about each other (about absolute RHP), and co-operative co-evolution between sender and receiver has ensured that the information offered is extensive and accurate. The second, which constitutes the *engagement* stage of the encounter, is a mutual exchange of the fact that each has decided that they have at least as much chance of winning as the other (exchange of signals of favourable relative RHP), and competitive co-evolution has ensured that the information is intensive rather than extensive, so that in most species it takes the form of what is generally called fighting.

It is suggested that the "signal" given off by the depressed patient reflects these two kinds of signalling. First, there is a cessation of activity related to the engagement stage in that the patient keeps "out of action" and does not seek new engagements; in existing relationships the change in signalling depends on the patient's relative dominance: towards dominant individuals the signal of favourable relative RHP (hostility) is reduced, whereas towards subordinate individuals it is increased. Secondly, there is a signal of low RHP in which the patient presents as someone who is incapable of fighting back because of a generalised incapacity, which in its extreme form includes even the capacity for signalling. The mildly depressed person is signalling on two channels with the paracommunication "I submit (unfavourable relative RHP), and even if I did not wish to submit, I am too incapacitated to do anything about it (low absolute RHP)", whereas the more depressed person is sending a signal about signalling with the metacommunication, "I am too depressed even to signal my submission." These signals relate to the agenda of the agonistic mode, but in humankind are usually transmitted in the hedonic mode, where they are associated with an inhibition of adulation-eliciting behaviour.

Apart from suggesting new animal models of depression, the main heuristic value of the theory relates to the expression of hostility in depression. It is predicted that expressed hostility to dominant individuals, such as an employer or a dominant spouse, is reduced in depression, whereas expressed hostility to subordinate individuals, such as employees, children and a subordinate spouse, is increased.

Some difficulties facing the theory have been discussed. Depression is commoner in women than in men, tends to occur after "exit" events rather than after "entry" events, and sometimes appears to be used to get one's own way. None of these phenomena is predicted by the subroutine model as it occurs in animals, and it is argued that they are due to the modification of the manifestation of the agonistic mode in humans by the evolution of affiliative behaviour, and by the influence of culture in the human lineage.

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