

Both sex orders of precedence govern the total life management of the pack; above all, however, they decide the ownership of "sexual rights". A bitch and a dog as top animals carry through their rank order and as single individuals of the society, they form a pair. Between them there is no question of status and argument concerning rank, even though small frictions of another type (jealousy) are not uncommon. By incessant control and repression of all types of competition (within the same sex), both of these " α animals" defend their social position. In the first pack which belonged to one bitch alone - without rival - I was once able to observe that this repression of the one status-high dog worked in favour of the other. (P. 87)

Social orders in wolf packs are by no means definitive and clear cut; they are far more equilibria among uninterrupted and interacting forces.

The periodically conditioned change of pitch and changing of pack composition or of living conditions disturb the equilibrium and often allow rivalry to blaze up into power. Each new social situation created by these fluctuations leads to the re-strengthening and re-establishment of dominance relationships. The dominance status order of wolves is conditioned by situations.

Every mature wolf has an ever ready "expansion power", a tendency to widen, not necessarily his personal territory,

but rather, his own social behaviour freedom, and to repress his "Kumpans" of the same sex. Consequently, he maintains a constant watchful interest in all socially important happenings within the pack. In particular, status quarrels are never private affairs between two individuals; the whole society takes a more or less active part in them. Individual differences of social initiative and the power of adaption to momentary situations are very clearly evident. For the status of the individual wolf these are of the greatest importance.

The status order with all its details is a result of the interaction of all forces in the whole society.

Even if great fluctuations do not destroy the labile equilibrium of the social order, the maintenance of a not-quite-classless status requires constant self-assertion. This is maintained by expression accomplishments which have the character of imposing (a demonstration of the social potential) or of threatening (scenes).

Whereas with relative stability of social relationships the measurement of opposing forces is restricted to expression as a "barometer", or measuring stick of the potential energies; on the other hand, a maximum disturbance of the equilibrium can bring about a spilling out of the fully locked-up kinetic energies; i.e. a real battle. As a matter of fact, this occurs generally only among contenders for " α position", and

then only in relatively few instances. In general, the usual conflicts of opinion remain somewhere in the middle between the two possible extremes (status demonstration - battle).

Those expression phenomena, which we characterized as demonstrations of social potential and as aggressions, however, are not just a few sharply defined expression postures and intention movements. Such expression elements in wolves are extremely full of nuances and occur in various combinations. They are always, however, only the subordinate, showy ingredients of complex expression behaviour and behaviour results. Again, these do not allow themselves to be limited by the environmental life behaviour pattern.

The whole behaviour pattern. i.e. the relation of each individual within the same social environment, is expression. Environment is taken into account in expression, is given socially conditioned implications, and thus attains a "social field of force" with renewed significance. The rank precedence of an individual manifests itself in very definite ceremonies and in freedom of behaviour in the social field of force. These are as much status-determined as status-establishing.

Firstly, therefore, the "enjoyment of the social position" is a type of status demonstration and is, hence, status preserving. It is only during fluctuations of the social equilibrium that additional controls (mixing in) and threats, i.e. motions of intention to battle,

are added to these expression values. A severe disturbance of the equilibrium finally brings about real battle.

A stable social situation (or clear-cut hierarchy) indicates a weak development of energies in social relationships and, vice versa, a disturbed equilibrium indicates a great development of energies.

With relationships of equal status, then, forces are continuously checked in development in such a way that aggressive energies cannot be used up within the framework of rivalries by wolves with initiative and of high status. In the packs under observation, specific release battles, which were sometimes characterized as "dry runs" and at other times as "energy displacements" (see below), witnessed to the storage of battle energies. These break loose at the slightest opposition, and are released at the weakest individuals of the society. In the development of such reactions, a close affinity with the taking of prey is indicated:

- a wolf of high status frightens a weakling in a "lying-in-wait position" and then perhaps pounces on the frightened one;
- a wolf of high status creeps up on a guileless weakling, falls upon him from behind and bites him in the neck;
- a wolf of high status attempts to grab a weakling, who is 'despairingly' defending himself, his excitement mounts steadily, and suddenly he

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pounces on his prey despite all opposition;
- several wolves of high status pounce on the
weakest wolf in the highest, sudden battle-like
excitement.

In these battle actions, however, an air of rejection and animosity, which is more or less clearly pronounced, comes to light, which nevertheless had another special significance in that in all of these actions the attackers belonged to another race of wolves than the prey. With certain definite exceptions, the attackers belonged to the larger race, the attacked individuals, however, were the repressed individuals of a smaller race of wolves.¹.

Often joint attacks by the large wolves were directed against one animal over a considerable period of time. This animal steadily lost the significance of environmental social partnership, was robbed of all social initiative and, in certain circumstances, with repeated attacks, became mortally wounded.

Despite rivalries and ravishing of the weaklings, the wolf pack continuously showed itself as an organic unit. This is evident above all when the whole pack atmosphere indicates friendly character - in chorus howlings, general "tenderness scenes", etc. - or when the whole pack presents a guarded front as a closed

¹.The concept of "race" is used here without claim to systematic correctness. (see III.B.)

society toward an "alien". Finally, sociability is shown as well in an "harmonious unity", in remaining quiet whilst awaiting food, on the whole in every situation and in the smallest detail - and last, but not least, the intra-social struggle.

The conditions of life in zoological gardens are marked by the absence of predation and by special circumstances in the avoidance of the enemy; these conditions alone, however, do not lead to the development of the above-mentioned social forces. The presence of both sexes in the society is of great importance as well, and also the size of the pack.

Rivalries (which occur exclusively with individuals of the same sex) only become violent when the society contains individuals of both sexes. If the total number of individuals continues to remain small, then all of the social disputes may be only rarely observed. The internal activity, then, is dominated by reaction to stimuli of the environment in the sense of tendency to flee; the wolves now appear shy. (P. 90)

On the other hand, as soon as the society controls a certain number of individuals, the manifestation of all individuals toward individuals from outside becomes more secure; "cool" observations, even threats to attack characterize their behaviour, with only rare indications of intimidated shyness and readiness to flee. When there

is added to the simulation to rivalries by the presence of both sexes, of which only one needs to be in majority, and to the suppression of escape-allied reaction against the outside world, resulting from "basic harmony of the collective security", an incapacity to actively oppose the outside world - predation, group battles -, then the conditions for maximum enhancement of the intra-social conditions have been fulfilled.

This would seem to indicate that reaction-specific energy in the basic behaviour mannerism of the wolf does not exist. The "displacement activity" (TINBERGEN, 1940), or perhaps better still "displacement attitude" has given up a characteristic quality in more primitive vertebrates; which is the deliberate jump from one "behaviour track" into another. The greatest variety of nuances and possible combinations in all socially (i.e. in expression behaviour) are characteristic perhaps generally of the most highly developed vertebrates, including the wolf.

III. PERIPHERAL EXPRESSION STRUCTURES AND NON-DELIBERATE EXPRESSION STRUCTURES

A. Scent Expression Structures

First, it should be stated again that we shall describe as peripheral structures those tendencies which do not indicate action or reaction, but which indicate an ever-present "form", which, however, owing

to showy elements are subject to certain expression reactions, or which require definite "presentation motions" in order to be effective as expression. The whole of the peripheral expression structures is the outer form, insofar as it is actually part of expression. The expression function of these structures may be optical or olfactory; in addition stimuli of the skin sensory organs come into play.

Here we are interested primarily in olfactory stimuli.

The scent expression functions of a macrosomate (P. 91) such as the wolf are possibly to a great extent outside of our direct experience. To a certain degree we can come to some conclusions by observing the "reception behaviour" of the social partner. Actually wolves will besnuffle one another repeatedly on particular parts of the body. This does not, however, occur as often with wolves as with domestic dogs, which meet on the street as strangers.

One should not consider, however, that scent expression, respecting its reception, is the essential component of most "snuffling scenes". On the contrary, the behaviour of snuffling itself has an optical expression value of almost greater intensity and permeation than scent expression; insofar as scent itself is concerned - it is, however, an indication of social initiative, a sort of invasion into the partner's sphere. The

besnuffled individual governs this invasion on his part by expression accomplishments whose effectiveness for the most part is not a result of olfactory components. Thus, the scent expression is instilled in superior "scenes", and these themselves are instilled in many complex courses of social relation behaviour.

The most important olfactory controls in wolves are described in brief as follows; they must form the indices for scent expression structures.

An attitude of peacefulness and lack of tension is a prerequisite to smelling the fur of the neck, the nose, the sides of the head and the mouth area. All these forms of olfactory control have completely subordinate social significance.

By snuffling the sides of the neck, the tip of the nose reaches the skin through the fur, so that the nose is completely lost in the hairs. The snuffler usually moves the head very slightly at the same time, whereby the tip of the nose moves searchingly in the fur of the partner.

Besnuffling the tip of the nose and the sides of the head is observable incidentally among friendly males and among male and female before the rutting season (Fig. 48 & 50). In the latter case, it is undoubtedly a component part of the very complex preliminaries to pairing.

It seems likely to me that the smelling of the lip area (Fig. 1) represents a behaviourism that tells

the wolf whether his partner has received food a short while ago, so that the probed scent would not be an "endogenous expression", and in this connection the term, expression structure, could not be used. It often happens that after a short while the besnuffled one moves aside with an upward movement of the head.

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In this connection it should be mentioned that in peaceful attitude wolves in general are interested in any large foreign objects in the fur of the pack comrade. Bone splinters, mud clots, stuck-together hairs, etc. are obviously discovered optically at first and are then probed with the nose. In like manner, bite wounds are looked for "in strangers", these are checked and sometimes licked.

The actual centre of scent expression in wolves is the anal region. Moreover, with the exception of the head, it is the most important centre of optical expression. Expression and control of the anal region are of great variety and have an extraordinarily high expression value.¹ Moreover, with one exception, the

¹. During the period of observation, the effective scent organs of the anal region proved to be primarily the genitals and the anus, and less frequently the upper part of the tail base (compare Fig. 4 to 6). The last mentioned region is the seat of the actual scent gland, according to Young & Goldman (1944, p. 73). My observations do not allow definite conclusions respecting its function.

scent associated system takes on less importance in social significance than the optical-acoustical system. At the same time, it is surpassed by more complex, physically higher expression values.

Without simplifying the conditions too much, it may be stated that the presentation of the anal region - scent-wise and optically - as well as controlling the anal region indicates social rights. In the bitch, control is seldom observed and presentation may only be seen in the winter. Withdrawal of the anal part from control on the one hand and lack of "control initiative" on the other hand denotes subordinate males; further, in the pack- and rutting season it signifies subordinate females, and in addition, it denotes all females at other times in a more or less clear-cut manner.

The withdrawal of the anal part is accomplished by curving the spine downwards, bending the back legs and "pulling in" the tail (Fig. 2), and further, under certain circumstances, by sideways turning away of the hind body. During tense relations, there may be added to these motions, repulsion or defensive attack, (Fig. 3). If, on the contrary, a peaceful, "erotically" coloured harmony exists, then shyness and rejection in the behaviour of subordinate individuals does not exist. Presently, a behaviour of passive submission (passive subjugation; compare Fig. 4 and 5) makes its appearance,