

Submission: Its Features and Function in the Wolf and Dog

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SYNOPSIS. Submission in the wolf and dog is defined on the basis of its motivation: submission is the effort of the inferior to attain friendly or harmonic social integration.

Submission functions as an appeal or a contribution to social integration, but only if it meets a corresponding attitude in the superior. The form of submissive behavior in wolf and dog is ritualized and symbolized cub-behavior. Two main forms of submissive behavior occur in wolf and dog: active submission, derived from begging for milk or food, and passive submission, derived from the posture which the cub adopts when cleaned by its mother.

The definition of submission is generally applicable to vertebrates living in groups based on intimacy and a social hierarchical order. The concept of submission as the role of the defeated in the terminal phase of fight with the function to inhibit automatically aggression in the superior should be dismissed. In vertebrates at least three types of conflict with different terminal phases occur: (1). Severe fight based on intolerance; ends with flight by the inferior or with his death. (2). Ritualized fight over a privilege; ends with the "giving-up-the-claim ritual" of the inferior, which automatically blocks the aggression of the superior. (3). Minor conflict in closed groups; settled by submissive behavior of the inferior.

In closed vertebrate groups, intermediate forms between (1) and (3) occur, depending on the proportion between activated intimacy and intolerance.

The terms "submission," "submissiveness," and "submissive behavior" (in German: Unterwerfung, Demutsverhalten, und Demutsgesäden) are often used in descriptions and discussions of social behavior in vertebrates. But what is the definition or concept of submission? In many cases it seems doubtful whether the observer has a clear concept or relies on a more intuitive and complex "understanding" of the situation. The latter can be more or less tolerated if the animal under study is relatively closely related to man and if observations of its social activity have been carried out over a long period. However, the above terms have been applied not only to anthropoids, namely the higher primates, or to the wolf and domestic dog, whose social reactions are extremely well known, but also to birds, reptiles, and fishes (Fischel, 1947). As to these groups of vertebrates our intuitive "understanding" could be misleading. A clear concept of submission is, therefore, important; otherwise the term "submission" is not a useful instrument for describing or analyzing social behavior.

The work was supported by a grant of the Schweiz. Nationalfonds (Nr. 3827) and by the Freie Akademische Stiftung Basel.

A CRITICAL REVIEW OF THE CONCEPT OF LORENZ

A concept of submission has been worked out by Lorenz (1943, 1949, 1953). He characterizes submission from the point of view of both function and form. He also outlines the main situations in which submission can be observed. According to Lorenz, submission in terms of its function is related to appeasing behavior insofar as it does not elicit antagonistic behavior or aggression. In addition it acts on an innate automatism which functions by *blocking* aggression.

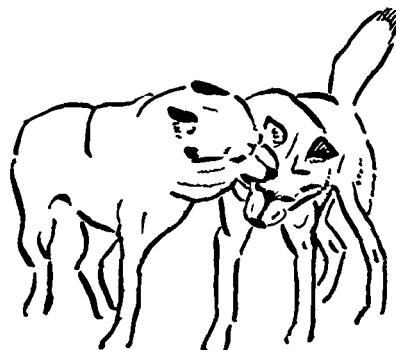
The form of submission is in Lorenz' views clearly related to the shape of aggression proper to the species. In earlier publications (Lorenz, 1949, 1953) he described submission as the exposure of the most vulnerable parts of the body to attack by the opponent respective to its killing method. Recently, however, he specified (Lorenz, 1963) submissive behavior as formalized or ritualized non-aggression where all possible intentional movements of aggression or of active defense are avoided. As in appeasing movements, the submissive animal turns its weapons away and does not even stare or look at the opponent.

Submission occurs, in Lorenz' concept, in intraspecific fighting when one animal proves to be markedly inferior and risks serious damage or even death. It, therefore, belongs to the "social outfit" of species with efficient weapons and killing methods. The *survival value* of submission is thought to lie in drastically reducing losses by intraspecific fighting, inasmuch as the aggression is blocked at the very moment the fight would result in severe damage or even in death of the weaker animal.

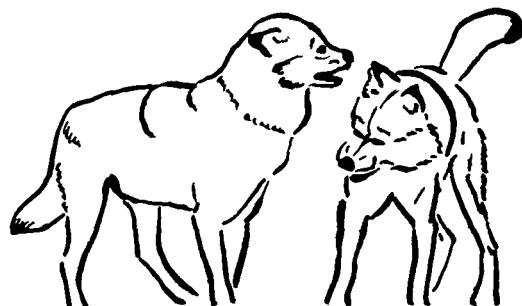
Lorenz (1953) mentions that observations in the wolf and dog were his first conclusive experiences to reveal to him the basic features or the essence of submission. He gives a description of the main aspects of submission in wolf and dog (Lorenz, 1948, 1949). When in severe fights one individual can no longer stand the other's attack, it suddenly remains motionless still growling and often in upright posture, and offers the side of its neck without any protection to the attack of the superior individual. Lorenz has himself never given an illustration of this scene, but Fischel (1956), who adopted Lorenz' concept, has published a drawing which he copied from a movie of the fight between two female collies (Fig. 1). No doubt this situation occurs frequently in conflict, but not in severe fighting, for wolf and dog. But the interpretation of the scene by Fischel, which is in accordance with Lorenz' viewpoint, is wrong.

As described and discussed in detail else-

where (Schenkel, in preparation), the supposed submissive posture is in reality a posture of superiority. Continuous observations of the social life of groups of wolves in captivity and of domestic dogs over many years have led to the conclusion that it is always the *inferior* wolf who has his jaws near the neck of his opponent. He indeed shows a strong inhibition to bite into the other's neck. Being the inferior he does not *dare* to bite! In the wolf and dog this scene shows several variations: (1) In some cases the posture of the superior appears as a challenge which the inferior is unable to face. (2) Sometimes the inferior really grips the head or the muzzle of the superior, but since the latter still keeps his proud, challenging posture, the former does not dare to bite with strength (Fig. 2). (3) In many



A



B

FIG. 2. A variation of the same scene in wolves:
a. The inferior wolf (left) grips the cheek of the superior and tries to press him down with one foreleg. But the superior (with his tail up) keeps his self-confident, challenging posture. b. A moment later: the inferior could not stand the challenge.

FIG. 1. Fischel's illustration of "submission." In Fischel's opinion the dog in front is submissive. In reality its posture with tail up and ears erected expresses superiority, challenge, and threat.

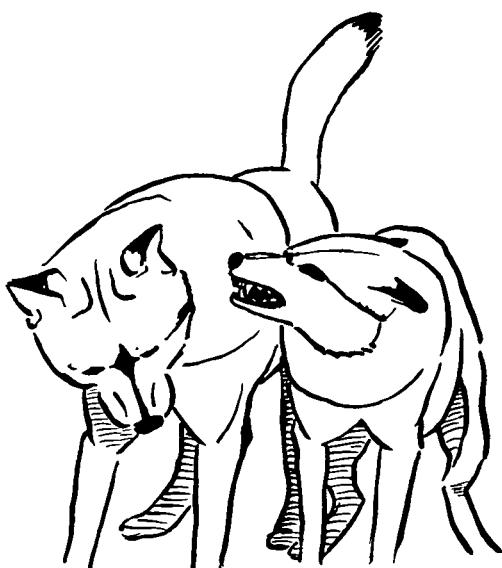


FIG. 3. The posture of the superior wolf (left) expresses challenge and threat; the inferior shows biting inhibition and defensive threat.

cases, the posture of the superior appears as a threat, *i.e.*, a preparation for an imminent attack (Fig. 3).

In fact, the posture is far from surrender. On the contrary, it is an important preparatory phase in wrestling fight which enables the superior to develop immediately a dangerous attack! Some of the tricks observed in this situation are as follows: (1) With one hindleg, the superior can suddenly push or block one leg of the opponent, and, with a simultaneous vigorous "body check," he can throw him. (2) He can suddenly move his jaws in the direction of his opponent's neck, and, while the latter turns his head backwards in order to parry the bite, he can throw him on to his back. (3) He alternately points with his jaws down towards his opponent's forelegs and upwards to his neck, forces him to move his head up and down in defense, and simultaneously pushes him again and again with body checks.

Practically the same posture and the same fighting tactics can be observed in other Canidae (*e.g.*, the jackal, Fig. 4, and fox), in many other carnivores (Mustelidae, Viverridae), and even in some rodents (*e.g.*, marmot).

As to the wolf and dog, Lorenz has misinterpreted a scene in social conflict. He observed an inhibition in biting. In the belief that the superior was inhibited, he came to the conclusion that the posture of the inferior partner released a biting or killing inhibition in the superior. Thus, he came to the concept of submission. In fact, the individual with inhibition to bite was the inferior. What Lorenz interpreted as a posture of submission is a challenging and threatening posture of superiority.

SUBMISSIVENESS IN WOLF AND DOG AND ITS DIMENSIONS

No observer of the wolf and dog will hesitate to agree that submission does occur in these animals. Therefore, it seems justified to discuss the corresponding behavior complex in the wolf and dog more thoroughly in order to define submission eventually. Any discussion of submission must be based on social *inferiority*. Friendly and antagonistic behavior between equals is incompatible with submission.

In the wolf and dog, inferiority is often combined with an antagonistic or hostile attitude. The inferior tends to avoid the superior's vicinity by means of flight, or he shows defensive aggression (Notwehrschnappen; Schenkel, 1947). Often a combination of avoidance and defense can be observed when the superior points at the inferior's hindquarters. The latter then circles in order to withdraw the unprotected part of the body and to parry the attack with his jaws. If the inferior has no chance to escape, he shows symptoms of social stress such as diarrheic defecation, tail bent downwards between the hindlegs, and inhibited locomotion. In all these cases of a marked antagonistic component, the term, submission, is not appropriate.

Sometimes an inferior wolf or dog approaches another of his species who rejects the approach by threat. But the former appears to ignore the threat, except if the superior rushes at him. Then he will escape quickly but immediately come back when the superior has given up pursuit. This type of behavior of an inferior animal

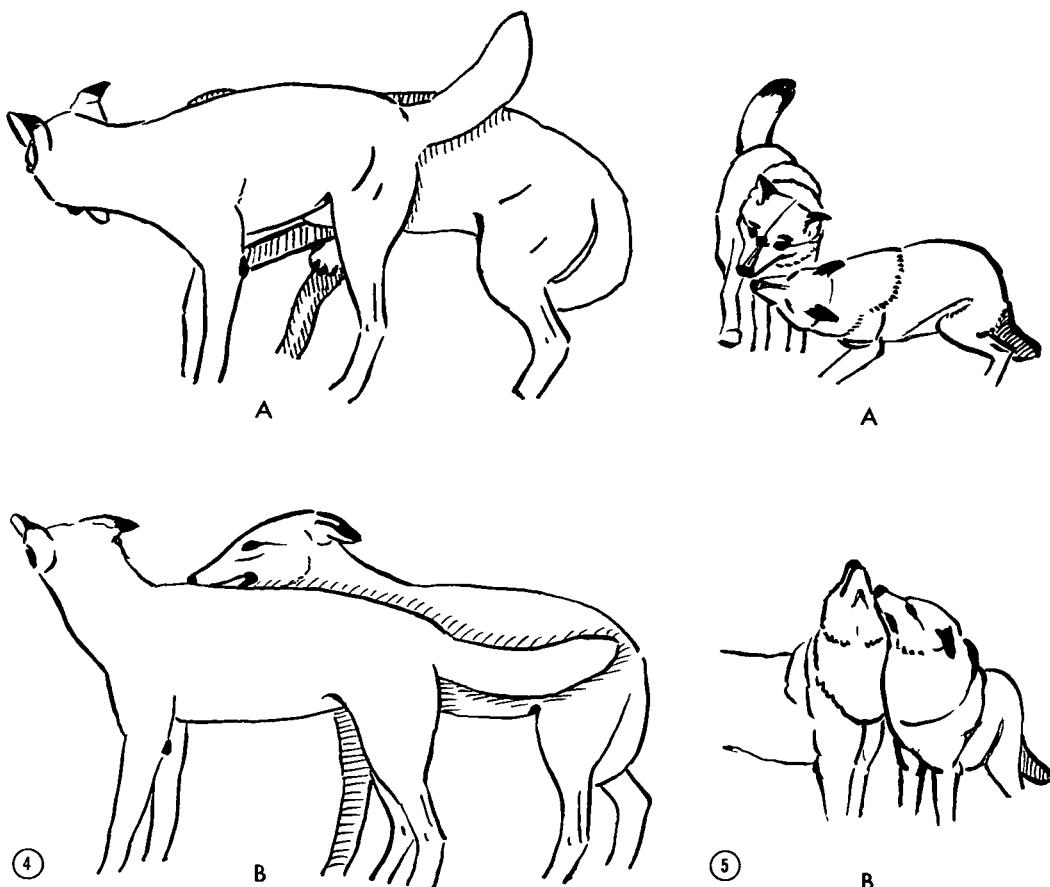


FIG. 4. The same scene as observed in female black-backed jackals in Kenya: a. The superior jackal uses its right hindleg to push the opponent's right foreleg, rendering it difficult to keep balance. b. Then the superior (front) adopts a posture between challenge and threat, while the inferior

shows inhibition.

FIG. 5. Active submission in wolves: a. With some severity in the attitude of the superior. b. The superior, in good mood, tries to avoid excessive caresses of the inferior.

might be described as obtrusive. In the case of submission, however, the component of obtrusion should be limited.

Obviously, the social attitude which we have so far characterized with (a) inferiority, (b) weak antagonistic component leading to flight or aggression, (c) weak component of obtrusion, can easily deviate in the direction of (a') non-inferiority, (b') marked component of antagonism or hostility, (c') marked component of obtrusion, respectively. It is, therefore, hardly possible to define clear limits to the attitude termed "submission." We find, however, that in the wolf and dog some roles in social behavior occur which agree with the

above conditions. They can be divided into two main types: active and passive submission (Schenkel, 1947).

Active submission (Fig. 5)

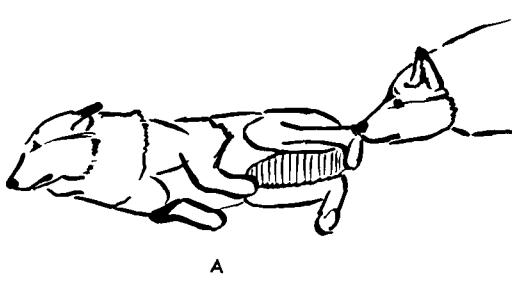
Active submission (Schenkel, 1947) is a contact activity in which signs of inferiority are evident: the posture is slightly crouched, the tail is low, and the ears are directed backwards and lie close to the head. There is no hostility in this attitude. On the contrary, signs of "friendliness" are very conspicuous: the inferior pushes the muzzle of the superior with his nose, licks it quickly with repeated strokes of the tongue, or

seizes it tenderly without any pressure. In addition he may perform pawing movements—lifting one forepaw and moving it in direction of the superior, or, while making little steps, tapping the floor with his forepaws alternately. Often the tail is wagging sideways, and sometimes the whole hindquarters are also swinging sideways.

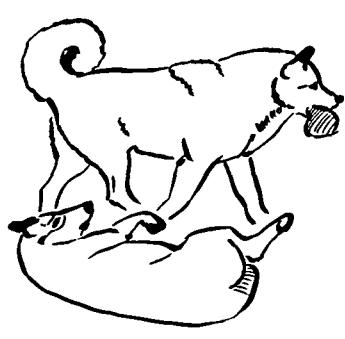
Two variants of this social role of active submission are especially significant: (1) Active submission occurs frequently as a *group ceremony*. The leader is surrounded by all other members of the pack who tend to nose-push, lick, or tenderly seize his muzzle or at least his face. (2) Submissive individuals show the nose-push as an *empty gesture* in the direction of the superior when they are at some yards' distance from him (Schenkel, 1947, Fig. 47).

Passive submission (Fig. 6)

In passive submission also the signs of inferiority are very clear: the inferior lies half on his side and half on his back exposing



A



B

FIG. 6. Passive submission: a. As a reaction to an inquisitive superior wolf. b. In the context of a symbolized begging-for-food ceremony in Eskimo dogs.

the ventral side of his chest and sometimes the abdomen. The latter occurs regularly as a reaction to olfactory investigation in the genital region. The ears are directed backwards and lie close to the head. The tail is more or less bent ventrally, so that it passes between the thighs. The often enthusiastic and friendly activity of active submission is reduced. Sometimes the tail is wagging sideways with extremely reduced amplitude and the activity is replaced by a passive posture full of trust, devotion, and demonstrated helplessness.

Intermediate forms

Besides the two main forms, some intermediate variants of submission can be observed occasionally. Two will be described here: (1) The inferior lies with his hindquarters toward the side and the anterior part of the body completely crouched. While the superior investigates him in the croup region, the inferior turns his head backwards performing a kind of empty nose-push (Schenkel, 1947, Fig. 5). (2) The inferior remains in a completely crouched posture, the throat flat on the ground; only his muzzle is slightly pointing upwards towards the head of the superior in front of him in an intimated empty nose-push. The superior often seizes the inferior's muzzle while uttering a growl (Fig. 7).

THE MOTIVATION OF SUBMISSION IN WOLF AND DOG

Our attempt to define the place of submission in the context of social contact has made use of some motivational aspects. Further insight into the motivation can be expected from a more accurate description of the social situation or scene in which submission occurs. *Active submission*, as described above, often occurs as a group ceremony. On sudden impulse, all or most members of a pack surround the leader in a submissive ceremony. In a similar way, subadult individuals, singly or in a group, "greet" an adult one. When a superior individual faces a resting inferior member of the group, the latter often reacts with empty nose-push from a distance or he may



FIG. 7. Domination-submission ritual in wolves.

rise, come towards the superior, and show active submission proper. The most obvious characteristics besides those mentioned earlier are the readiness to actively enter into contact with the superior and the often overwhelming offer of friendly affection. We may, therefore, characterize *active submission as impulse and effort of the inferior towards friendly harmonic social integration.*

This statement agrees with the fact that active submission has a begging quality such as "begging for food," or "begging quarter." Sometimes it appears as a begging-for-food-scene. An observation made in Whipsnade may illustrate this case:

After rising in the morning the leader of the pack walked around sniffing the soil. Somewhere he stopped and dug out a big bone. He seized it and passed, the bone in his jaws, near the pack in "proud" gait with his tail up. Now the other wolves rose, surrounded the leader, and joined in a begging ceremony. The leader first growled and continued his walk. Then he dropped the bone and left it. The others surrounded the bone for an instant, and then also left the spot. Obviously the begging-for-food-scene was not a real but a symbolic one. The bone was only a requisite for the leader and the pack to join in a ceremony of harmonic social integration.

Similar scenes with some kind of requisite

occur quite frequently in the wolf pack and among dogs or between man and dog. Often they appear as a social play.

Passive submission also has a begging quality and may occur in a begging-for-food ceremony. But, in addition, it expresses some kind of timidity and helplessness. It occurs when the inferior is strongly impressed by the partner's superiority. This is most pronounced when the superior approaches the inferior, is inquisitive, sniffs at him persistently, or maintains an attitude of severity that is of retained threat. In accordance, a leader is never surrounded by several members of the pack in passive submission; but several highly ranked individuals may surround one inferior who exhibits passive submission.

In *intermediate forms of submission* the motivation also has some characteristics in common with both active and passive submission. The activity of the inferior often shows the quality of caress or flattery, while the superior is inquisitive or demonstrates severity in seizing the inferior's muzzle, emitting a growl (Fig. 7). This scene may occur in a group ceremony. The leader is surrounded by the pack. Some show active submission and others this intermediate form. The leader seizes the muzzle of one or the other of the group members.

From the point of view of motivation we may define submission in the wolf and dog as an impulse and effort of the inferior towards friendly and harmonic social integration. The variations in form and motivation show that submission is a social role which depends on the response of the partner. It belongs to a certain social situation or scene to which both the inferior and the superior contribute. Submission can only develop in the inferior when the superior shows tolerance or at least does not destroy in the inferior the expectance of tolerance. The different types of submission correspond with the nuances in the attitude of the superior. The more the latter shows tolerance and friendliness, the more active the type of submission. The more inquisitive and severe the superior is, the more the inferior tends toward the passive type of submission.

If the superior is tolerant but fails to display his superiority, the inferior may behave obtrusively. In case the superior is not tolerant, *i.e.*, threatens or even attacks the inferior, the latter tries to escape and to defend himself and shows signs of social stress.

THE FUNCTION OF SUBMISSION IN WOLF AND DOG

We have stated that submission can only develop in the inferior if the superior shows appropriate responses. This is also important from the aspect of function. Submission is a contribution by the inferior or an appeal to friendly social integration. But there is no evidence for a stereotyped automatic reaction in the superior. On the contrary, the superior also appears as a source of social impulse. He will react favorably to the inferior's appeal if his affective disposition is in favor of social integration with the inferior. But in other cases intolerance or fighting spirit will prevail in the superior despite the initial submission of the inferior, and the latter's effort to social integration will fail.

We may conclude that submission is a contribution by the inferior to harmonic social integration on the basis of social hierarchical differentiation. It does not elicit a stereotyped automatic response. Integration asks for a contribution by the superior also, that is, tolerance. The superior's contribu-

tion may even exceed submission in its competence to shape the social contact or relation.

THE ORIGIN OF SUBMISSION IN WOLF AND DOG

In the following, the ontogenetic development of the main types of submission in the wolf and dog are discussed briefly.

Active submission

The group ceremony of active submission with a bone as a requisite clearly resembles a feeding scene between a parent arriving at the rendezvous place with a piece of prey and the cubs who have been waiting for him. In much the same way the group ceremony without requisite repeats the feeding scene in which the cubs stimulate the parent to regurgitate food. Generally, active submission develops as a side branch of infantile begging for food. This begging activity itself can be traced back to the suckling situation. The ontogenetic interrelationship of these behavior units is outlined in Table 1.

Obviously the social scene in which the inferior partner shows active submission is a slightly transformed feeding or suckling scene between parent or mother and cub. The submissive activity is, in its essence, an activity of the cub. The scene with active submission has maintained two sociologically important features of the original

TABLE 1. *Ontogenetic interrelationship between feeding contact and submission.*

Suckling and feeding contact	Symbolized
Introductory movements to suckling (nose pushing, licking, seizing, milking steps = "Milchtritt")	
Begging for milk (Partner = mother)	Begging for "love" = active submission (with nose-pushing, licking, tenderly seizing and tapping with forepaws)
Begging for food regurgitation (Partner = parent)	Partner = superior wolf Performed by a single individual or as a group ceremony
Begging for parts of a prey carried in the jaws (Partner = parent)	With requisite (food symbol) Performed by a single individual or as a group ceremony

feeding or suckling situation, namely intimacy and differentiation in the roles of the partners involved. On the other hand, the scene is functionally transformed. It has lost the nutritional and emphasizes the social function.

Passive submission

In considering that active submission is derived from an active role of the cub in a parent (mother)-cub interaction, we have to expect that passive submission "repeats" a passive role of the cub in a scene in which a parent or the mother is "inquisitive." We have mentioned that in scenes with passive submission, the superior often sniffs at the inferior, especially in the genital region. It is in this situation that the inferior lifts a hindleg. This variation of the scene has a parallel in the mother-cub contact which consists in olfactory investigation and ano-genital licking by the mother.

Passive submission is derived from a suckling posture which is connected with maternal care. As a type of submission it calls for friendliness and tolerance.

DISCUSSION

Submission in wolf and dog

With the intention of giving a clear meaning to the term "submission," we have analyzed a special complex of social behavior in the wolf and dog, a complex that is characterized by the combination of inferiority and a positive social tendency ("love") and does not contain any component of hostility or obtrusion. This complex is called submission. Its *motivational source* is the impulse or tendency of the inferior to attain friendly or harmonic social integration. The *form* of submissive behavior in the wolf and dog was analyzed as symbolized and ritualized cub-behavior. The begging for milk or food plays an important role in the feeding community between mother (or parent) and cub. In "representing" this scene, the submissive wolf actively begs for tolerance and "love." If the superior wolf is more inquisitive, the inferior adopts the more passive role of the

cub: it "represents" the cub that is investigated olfactorily and licked by its mother, especially in the ano-genital region.

Besides these two main forms of submission, a clearly active and a more passive one, there are a few intermediate variants which consist of a combination of both main situations.

There is no doubt that submission is an appeal or effort to friendly social integration, to which the response by the superior is not stereotyped or automatic. Only if the superior, too, is motivated to enter into friendly contact with the inferior, will harmonic social integration really take place. If he responds with non-tolerance, the inferior will not persist in submission. Both components of submission, namely inferiority and "love," can only exist if they meet "generosity," i.e., superiority combined with tolerance or tolerant "love." Both the superiority-inferiority relation and the atmosphere of "love" and intimacy do not rely on automatic responses but are shaped in the social contact as components of "personal" interrelationship.

Submission in vertebrates generally

The definition of submission (German: Demut) which we have developed with regard to the wolf and dog is, to a large extent, in agreement with the colloquial meaning of the term. But can it be applied to the social life of other vertebrates as a useful definition?

Obviously, submission in the sense described here is restricted to a special social type of vertebrate. It occurs only in species where individuals can be attached to each other by a positive social tendency—"love"—and where, between the individuals, hierarchical differentiation can be found. In many species these conditions are not both realized. This will be illustrated in a few examples.

(1) In solitary carnivores, rodents, and insectivores there is no "love" between individuals of the same sex. Yet hierarchical differentiation may occur. When two males repeatedly meet, conflict will arise and sometimes even fighting in which the same

individual will always have the upper hand. The other has to flee or risk being killed.

(2) A similar result is to be expected in strict territoriality. In this case the superiority-inferiority relationship will change with the place of encounter. The resident will be superior, the intruder inferior.

(3) Open associations of vertebrates are based on some kind of positive social tendency. But they are often "anonymous" and correspondingly without hierarchical differentiation or any kind of "personal" relationship.

(4) Not in all closed groups of vertebrates does "love" seem to be combined with a social order of rank. At least the latter is not conspicuous in species like howling monkeys (Carpenter, 1934) or the African hunting dog (Kühme, 1965).

In all the cases mentioned we will not find submission.

The forms of submission

Submissive behavior is part of a social scene. This scene must give evidence for mutual "love" and a superiority-inferiority relationship. Evidently the wolf and the dog are not equipped with an original set of behavior patterns reserved solely for this scene. The scene and, with it, the roles are derived from mother (parent)-cub interactions. The latter are characterized by both "love" and functional differentiation. In the derived scene of tolerance-submission, the functional differentiation has developed a hierarchical aspect. Love and functional differentiation are also characteristic of the male-female contact, and, indeed, elements of this scene with altered function are also found in tolerance-submission scenes. In many vertebrates where the male is dominant over the female as in different monkeys, some rodents, many birds, and cichlids, the submissive individual "plays" female; the superior and tolerant partner adopts the male role.

In order to avoid misunderstanding it must be pointed out that, in many species, behavior patterns derived from child or female behavior occur without expressing submission. We may conclude that submis-

sion belongs to the behavioral equipment of species where individuals keep together on the basis of personal "love" or intimacy and of hierarchical differentiation. Such species need a representative ritualized scene that confirms the tolerance-submission relationship. The behavioral forms of this scene are derived from two sources, namely, the mother (parent)-child and the male-female interactions. Submission is expressed by symbolized cub or female roles, and tolerant superiority by mother (parent) or male roles.

Submission and fight

Submission as defined here does not occur in connection with severe fighting. This is in contrast to the concept of Lorenz and Fischel who place submission at the end of a fight, when one opponent has been defeated by the other. Fischel (1947, 1956) even maintains that in vertebrates generally conflict with fight goes through the three phases of showing-off, fight, and gesture of submission (German: "Unterwerfungsgebärde") by the defeated. This gesture has been claimed to be homologous and to have the same function in all vertebrates, that is, to block aggression in the victor. "Surrender," "imploring mercy," and "submission" ("Unterwerfungsgebärde," "Gnadeleben," and "Demutsgesäß") are the terms used indiscriminately to denote this gesture in the terminal phase of fighting. Obviously this concept does not take into account the fact that the relations between individuals generally and the character and function of antagonism and fighting between them in particular show enormous differentiation. Is it, therefore, possible that the terminal phase of all fighting has equal functions and is regulated by the same automatisms? The following consideration is an attempt to outline some main types of intraspecific antagonism and fighting and their respective terminal phases.

(1) In fights based on strict intolerance, e.g., territorial intolerance, the inferior will be damaged and killed if he is unable to defend himself effectively or to escape. He may literally break down; but this will not

prevent the superior from damaging or killing the defeated rival. In such species, fighting is an intraspecific factor of population control.

(2) In many species, fighting arises almost uniquely over special privileges and is limited in its function to regulate the allotment of privileges. The most frequent case is male rivalry over sexual privileges. In this type of conflict, aggression is elicited by another member of the same species and the same sex that claims the same privilege. The one that proves inferior will simply give up the claim and the superior, which is now uncontested in his privilege, is no longer stimulated to fight, because the releasing stimulus has disappeared. It must be of advantage to a species in which fighting has only the above-mentioned function, if the act of giving-up-the-claim is unmistakable. Otherwise the superior might, by mistake, continue to fight and damage the defenseless partner. In fact, in many species, giving-up-the-claim is ritualized and this ritual blocks aggression in the superior. Still another widespread method contributes to the functional limitation of fighting, namely ritualization of the fight itself (German: "Kommentkampf"). This type of fighting decides which is the superior without causing damage. It should be mentioned here that in experimental conditions (overcrowding) intolerance can be induced which is not related to privileges. In such conditions severe fight ("Beschädigungskampf") can occur in species in which only ritualized fighting is observed under natural conditions.

(3) In the closed social groups of many species, the social hierarchy regulates a privilege system. Yet, the social rank may be connected with many other functional differentiations within the group. Minor conflicts between members of the group are not always clearly connected with a privilege, but seem to be stimulated by actual features of the rank-situation and the social bond itself. In conflicts of this type, submission of one individual in the sense of our definition may restore the peace as an effort to social integration on the level of accepted inferiority.

(4) Vertebrates that form closed and exclusive groups tend to live in a socially polarized field (Schenkel, 1966a). The group is the sphere of harmony and intimacy. Outside members of the species are enemies. The harmony within the group is connected with social and especially with hierarchical differentiation, and troubles in the rank order are normally settled in minor conflicts as discussed above. But between different groups, there is strict intolerance, often connected with territoriality as for instance in the wolf or lion (Schenkel, 1966b) and many primates. But the status of a clear polarization is not permanent. Especially, when a leader weakens, and when a new generation grows up, the sphere of intimacy within the group may be heavily disturbed. Growing intolerance within the group will manifest itself in fights of varying severity. Alienation can lead eventually to the splitting of the group. If only one or two individuals are outcasts or have split off, they are inclined to take up contact and even join with strange individuals. They may be rejected, as Murie (1944) and Mech (1966) have reported in wolves, but in exceptional cases enmity and intolerance between former strangers may weaken and a new sphere of intimacy may grow.

In vertebrates, mainly in mammals, which normally live in exclusive social groups, conflict varies between two marginal modalities. On one side strict intolerance results in merciless fighting if the hostile parties are not inhibited by reciprocal fear of each other. On the other side, if intimacy prevails, only minor conflicts occur which dissolve as soon as the hierarchical and social differentiation are clearly settled. Varying proportions of intimacy and intolerance result in conflict or fighting of varying severity.

In conclusion, in vertebrates at least three basically different types of conflict or fighting are found which each lead to a different terminal phase (Table 2).

(1) In severe fighting based on intolerance, there is no ritual of submission or surrender or imploring mercy, and the superi-

TABLE 2. Three different forms of conflict.

Motivation	Style of conflict	Function of conflict	Role of the inferior in the terminal phase of conflict
1) Intolerance, perhaps fixed to territory	Merciless fight	Elimination of surplus individuals from living space	Escape or breakdown and being killed consequently.
2) Claim for (sexual) privilege in males	More or less ritualized (Kommentkampf)	Selection of the momentarily fittest individuals (males) for breeding	Giving-up-the-claim ritual, which ends the fight.
3) Claim for hierarchical position in intimate, closed group	Minor conflict (showing-off, threat; not real fight)	Consolidation of hierarchical differentiation and of social integration within the group	Submission. Effort of the inferior toward social integration.

or is not automatically inhibited from killing the inferior.

(2) In ritualized fighting over a privilege, the "giving-up-the-claim ritual" blocks aggression in the superior, but it does not have the character of imploring mercy or of submission as a personal attitude towards a superior partner. The inferior may momentarily give up the claim and perhaps shortly afterwards try again.

(3) Submission belongs to a sphere of intimacy or is the effort to create such a sphere. It does not stimulate a definite automatic response. Only if submission meets a corresponding attitude in the superior will it persist in the context of a friendly personal relation.

REFERENCES

- Carpenter, C. R. 1934. A field study of the behaviour and social relations of the howling monkeys (*Alouatta palliata*) Comp. Psychol. Monogr. 10: 1-168.
 Fischel, W. 1947. Die kämpferische Auseinander-
- setzung in der Tierwelt. Leipzig.
 Fischel, W. 1956. Haushunde. Handbuch d. Zoologie. 8:1-16.
 Kühme, W. 1965. Freilandstudie zur Soziologie des Hyänenhundes (*Lycaon pictus lupinus* Thomas, 1902). Z. f. Tierpsychol. 22:495-541.
 Lorenz, K. 1943. Die angeborenen Formen möglicher Erfahrung. Z. f. Tierpsychol. 5:235-409.
 Lorenz, K. 1949. Er redete mit dem Vieh, den Vögeln und den Fischen. Borotha, Wien. 205-209 p.
 Lorenz, K. 1953. Verständigung unter Tieren. Forum (Fontana, Zürich) 1:47-48.
 Lorenz, K. 1963. Das sogenannte Böse. Eine Naturgeschichte der Aggression. Borotha, Wien.
 Mech, L. D. 1966. The wolves of Isle Royale. U. S. Natl. Park Serv., Fauna Ser. 7. 210 p.
 Murie, A. 1944. The wolves of Mount McKinley. U. S. Natl. Park Serv., Fauna Ser. 5. 238 p.
 Schenkel, R. 1947. Ausdrucks-Studien an Wölfen. Behaviour 1:81-129.
 Schenkel, R. 1966a. Zum Problem der Territorialität und des Markierens bei Säugern. Am Beispiel des Schwarzen Nashorns und des Löwen. Z. f. Tierpsychol. 12:593-626.
 Schenkel, R. 1966b. Play, exploration and territoriality in the wild lion. In Play, exploration and territory in mammals. Symp. Lond. Zool. Soc., Nov. 1965. 18:11-22.

