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The role of aggression in group formation

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# The role of aggression in group formation

When I was asked to give a presentation, I said I had nothing to present, because adolescence is a purely human phenomenon; I also said that the particular period between childhood and puberty or between puberty and maturity was something that simply did not occur in any animal I knew. I would have to talk about anthropologic subjects, which would not be my own field at all.

Dr. Fremont-Smith said, "Your special subject, the goose, reaches its full body weight in 9 weeks, it gets betrothed, forms provisional adolescent formation and group formation at one year of age, is sexually mature at 3 years of age, and lives to be 60. Man has a period of adolescence, and you know something about group formations taking place during that period, so why not talk about that?

I decided then that I would like to speak on the subject thus mapped out by Dr. Fremont-Smith and I find I have much to say. I hope you will interrupt me when I tell you something you don't believe because I expect much flat disbelief of facts. I am not going to give you much interpretation. What I am concentrating on are just descriptive, random facts which we observed in our geese.

Before going into the special subject, I ought to say what I mean by group formation: It is the formation of a personal bond between two or more individuals. I assure you that this "bond" is defined in a purely objective way, and in a very simple way at that, meaning that these two individuals stay together in space much of the time, that if one runs away or is taken away, the other will follow it, that, if you separate them, you get searching behavior. In other words, each of these individuals behaves toward the other as a territorial animal does to its home. Meyer-Holzapfel (1) has coined a very good term for this: "Das Tier mit der Heimvalenz" — the animal with the home valence — which I consider very apt. Though

objective, it holds something of the emotional warmth which I am certainly the last to deny.

Going through the whole hierarchy —

*Fremont-Smith:* The animal behaves towards the other animal in the pair as if the other —

*Lorenz:* Not necessarily in a pair, it might be in a group.

*Fremont-Smith:* The one animal behaves toward the other one in the group as if that other one was the home, the territory, but the difference would be that the territory does not react upon the individual. However, the other one in the group does interact and, therefore, the warmth is greater.

*Lorenz:* Yes. Just yelling out loud doesn't bring home to you but it brings your home-friend back to you. It is an important difference, I quite agree.

If you go through the whole hierarchy of vertebrates, you find a very queer correlation between aggression and personal bonds. I'll say later what I mean by personal bonds. There is no nonaggressive animal able to form personal bonds. Aggression, and I mean aggression against a fellow-member of the species, is in itself a very interesting phenomenon. For Freud, aggression is something intrinsically against the survival of the species; aggression, for him, is curiously related to his "death drive," which, of course, is nonsense. You must ask yourselves what the survival value of fighting is?

If you take two vertebrates of one species, two animals which are unknown to each other, and put them together in a cage or test box, in 99 per cent of vertebrates there will be a fight. This fight is dependent on a number of factors. For instance, one factor is that animals must know the locality. They must feel at home in the locality because, if they are in a strange locality, they will very often flock instead of fighting.

If two cichlids are put together in a tank which looks exactly like the home tank, and they can think they are at home, they will fight. If they are put together in a large pond, they put on quite a particular color, which is a nonfighting color, and they flock together.

What I want to point out at the outset is that this type of flocking is anonymous, and anonymous flocking is something entirely different from a personal bond. Anonymous flocking occurs, let us say, in fishes swimming together. It occurs in birds on migration; the flock of starlings is entirely anonymous. Curiously enough, starlings don't really fight, because they are incapable of individual recognition. As far as we know now, a starling recognizes its mate

only by the fact that he or she is creeping into the same nesting hole. It is only this local sign which tells one bird that the other is its mate.

*Birdwhistell:* These are starlings?

*Lorenz:* Yes, but don't generalize that. I don't know another bird that does it, which is quite amazing.

*Liddell:* Isn't the gathering of a crowd at the scene of an accident an analogous phenomenon?

*Lorenz:* Yes.

*Gofman:* A parallel comment might be made about human societies. As you move from rural settlements to small towns and then to larger cities you reach a point, in American society at least, where unacquainted people passing on the street don't say hello to each other. There must be a previous introduction or special reason for passing greetings to occur. But below this line, on the rural-urban continuum, the rule is that you offer a greeting to anyone you pass, whether or not you have been introduced before, and whether or not you know him for a stranger. This is little like anonymous flocking.

*Lorenz:* You mean in the small city you don't know the chap?

*Goffman:* Yes, below the non-greeting line, mutual presence in the same territory is enough.

*Lorenz:* There are lots of such sliding transactions between anonymous and non-anonymous greeting. I am just drawing a sharper line.

*Mirsky:* On the physiologic level, you state, when these animals are in a strange environment, that is when the flocking occurs, but if they are in —

*Lorenz:* In their own environment, they will fight.

*Mirsky:* The reason I asked for a restatement is that if an animal is put into a strange environment, a marked physiologic change occurs in that there is an activation of the hypothalamus, which we can demonstrate in a variety of ways. Accordingly, the animal is no longer the same the moment it is put into the strange environment.

*Fremont-Smith:* On that same point, in the environment, when they feel at home, almost by your own definition, they have already established bonds to the territory and, therefore, the presence of another one so near in the cage is an invasion.

*Lorenz:* Exactly.

*Erikson:* How will they fight?

*Lorenz:* Of course, each kind fights in a different way. Fish are good subjects for the study of these phenomena, because they have

relatively controlled color patterns. The color pattern of chromatophores tells what physiologic state they are in. If Etroplus, Asian cichlids, are put in a tank, it is possible to tell by their coloration whether they will fight or whether they will flock.

*Mirsky:* I believe that it should be emphasized that we must be careful about extrapolating in terms of socialization because of the probability that the animal is in a strange environment; it is itself in a different state.

*Lorenz:* Yes.

*Fremont-Smith:* And so is the person.

*Mirsky:* I can only talk of that which we know. We assume about people but we have no measurements.

*Fremont-Smith:* Yes, we have measured them.

*Birdwhistell:* It appears that Americans, when standing face to face, stand about arm's length from each other. When they stand side by side, the distance demanded is much less. When "middle majority Americans" stand closer than this in a face-to-face position they will either gradually separate or come toward each other and begin to emit signs of irritation. However, if they are put in a situation in which they are not required to interact — say on a streetcar — they can stand quite close, even to the point of making complete contact.

The amount of this territory seems to vary culturally. So, there can be a situation where two or three ethnic groups occupy different territories, that is, varying amounts of personal space. For example, put together a Southeastern European Jew (who occupies about half the area of personal space) and a middle class American and a high degree of imitation results, particularly if the middle class American keep drifting around to the side, in order not to be insulting, and the Southeastern European Jewish man tries to move around to get face-to-face relationship. You get an actual dance, which very often turns into what is practically a fight. I have observed this a number of times.

*Lorenz:* That is an excellent example. I may add that people who notice other people drawing back from them and avoiding the face-to-face contact develop a hypertrophy of the drive to get nearer, and these unfortunates are those cursed with halitosis. It is a known fact that people with halitosis try to get nearer and nearer to you because they are conditioned to everybody moving backward from them. That is quite in line with what you say, the same phenomenon of hypertrophy in a much more exaggerated situation.

*Fremont-Smith:* Dr. Erikson, you had a question about fighting that wasn't answered.

*Erikson:* I wanted to know something about the quality of fighting and how far it would go.

*Lorenz:* I am now making a very large generalization. The answer is, to any extent, to killing each other, or to just having a little more or less ritualized bout which settles the rank-

order relationship between the two animals you put together.

*Erikson:* Does that depend on the personality?

*Lorenz:* That depends on lots of things.

*Fremont-Smith:* On the species, too, doesn't it?

*Lorenz:* Yes, of course, but I am now putting forth rather sweeping generalizations. The point which I want to make is just this: Unless you get an animal in the physiologic state of readiness to fight, and of a species which is ready to fight, you cannot get a personal bond. Or, putting it the other way round, as far as we know today there is no single case where a personal bond is formed either in a species which simply does not have the possibility to fight or in animals which are in a physiologic state of non-fighting, even if they belong to a potentially fighting species. In other words, the non-fighting anonymous aggregation never shows any group formation, any personal interrelation between individuals. This is a thing which became clear to me only very lately and which I think is very curious.

Why do animals fight? Let us look at it from the ecological side. Quite obviously one of the most important survival values of intra-specific fighting is spacing out of individuals. One pair of blue jays needs a territory of this or that size. If a given area is at the disposal of a given number of pairs, it is of obvious survival value to distribute them evenly over this inhabited area.

Another factor which makes aggression valuable is rival fighting, for instance in cichlids. Where males defend the family, there it is in the interest of the latter that the father is the largest fish accessible to the mother. It can be demonstrated in a very convincing manner that in a community tank the bigger the male, the better the chances for the babies to get reared.

Whenever you have an animal of a species which will fight con-specifics and is in the physiologic state of fighting, this animal would fight any conspecific, including —

*Mead:* I think you had better define that word.

*Lorenz:* Animals of the same species, fellow members of the species — conspecific.

The difficulty is he will fight the female, too. In many species where one parent only takes care of the young, it is sufficient that sexuality inhibits aggression long enough to make a momentary

contact possible and immediately after copulation, the male chases out the female or the female chases out the male, and that is that. The moment there is a pair which defends the territory and the babies together, there arises an enormous problem: how to prevent the fight between a pair of cichlids, let us say, how to make it possible that one cichlid tolerates the other, even when the latter is giving all the key stimuli to fighting, because it is itself fighting a third cichlid. It is erecting its fins, showing all the motions of excitation, but yet does not release fighting. It is sending out all the optimal stimulations of fighting but does not release a fight.

Every time I see a pair of cichlids fighting and chasing out an intruder, and not reacting to each other, it is to me one of the major miracles.

The miracle is brought about by a very special physiological mechanism in which learned responses and particularly habituation play a large role. The fish learns to tolerate the approach of its mate, and it takes quite a long period of pair formation to do so. At first, fights threaten to break out at short intervals. They are then suppressed by certain innate behavior patterns of which I shall have something to say in a moment. But as mutual habituation proceeds, these beautiful fight-suppressing ceremonies become rarer and rarer until habit and routine take over more or less complete control of the married life of these fish.

What concerns us here are the unlearned behavior patterns which suppress fighting. They have often been termed "submissive" attitudes, etc., but they certainly are not purely submissive. They often involve a very active approach of the partner. In many cases they obviously have been developed under the selection pressure of the Innate Releasing Mechanisms which elicit fighting, but in a very curious way so as to represent a sort of negative of that stimulus situation which does release fighting. If, for instance, a fish, in order to release fighting, erects its fins, turns broadside-on to its partner and moves forward in jerks, then, in order to signify peace, it does the very opposite. Forgive me, for the moment, for this teleologic shorthand, which just denotes the biological function. I assure you I am not a teleologist. I mean it is the function, the selection pressure of which is —

*Steinbach:* You can be a teleologist.

*Mirsky*: What is wrong with teleology?

*Lorenz:* I object to it very strongly. If the fish stands broadside-on, presenting the largest possible contour in threatening, then, in the peace ceremony it will turn edgewise and fold all its fins. If it moves in jerks when challenging a fight, it glides slowly to prevent

it. If it threatens head-on to the rival, it approaches tail-first in the peace-ceremony. Very many female cichlids do that.

The principle of these negative fight-releasers was discovered by Niko Tinbergen of Oxford University and me, simultaneously. We were watching a pair of coots. The white patch on the forehead of a coot is used in threatening. As we were watching these two coots approach each other in a sexual mood, suddenly they bent their necks forward and lowered their heads, so that the white patches disappeared below the surface and ceased to exist as key stimuli to fighting. The moment Dr. Tinbergen and I saw that we each started to try to tell the other what the whole thing meant. The question of priority is still not settled. That was back in 1937.

*Peck:* I didn't get the matter of standing, so they present the least breadth. Did you say that, when they want to avoid fighting, they might stand so that the greatest breadth —

*Lorenz:* No, when they avoid fighting, they try to look as small and as unobjectionable as possible. If you want to see that nicely, take the common fighting fish, *Betta splendens,* which threatens broadside-on with all fins erect while the female, submissive, does just the opposite, all fins folded and presenting the narrowest possible contour to the male; in order to avoid attack, she must never show her broadside. They dance around in a circle, under the nest. This circling has led to their special copulation movement, when the two bodies entwine in two opposed half-circles. It is really very beautiful, like a Siamese dance.

*Mead:* Will you also say when you are talking about fish or birds?

*Lorenz:* The cichlids are a family of tropical perch, very close to sunfish and, outwardly, quite similar to them. In cichlids, we find one "peace-ceremony" which is of particular interest because it is a functional analogy to the triumph ceremony of geese, which is my main subject now.

This so-called greeting ceremony is really what Dr. Tinbergen has called a re-directed activity. A re-directed activity is just this: If I am furious with my boss, my fear may inhibit my aggression against him, so I release my aggression toward the underdog or toward anything else.

If I am furious and 1 don't want to strike you, I could, for example, strike the table. This is a re-directed activity. Re-directed activities can become ritualized, and I need not explain ritualization to this group.

In cichlids, the peace or greeting ceremony originates out of a re-directed attack in the following manner: The fish starts out actually to attack its partner. In the last moment, this attack is inhibited

by individual habituation, if you will, by personal acquaintanceship, and also by sexual motivations. In this conflict, the fish swerves around the partner and attacks another fish, or even launches a "sham" attack into emptiness. The peace or greeting ceremony, in its ritualized form, still contains the motor patterns of mutual threatening but is clearly distinguishable from real threat in one important point: The fish does not stop when standing broadside-on to the partner, but swims *past* him and even emphasizes the fact that he is going elsewhere to attack by accelerating a bit while going past the mate. The presence of real aggressive motivation is still plainly discernible. When one fish relieves the other from "duty" at the nest by the ceremony just described, the relieved one, while coming forward a few inches in order to be on the move while meeting the oncoming partner, and after performing the ceremony, immediately continues on to the territory border, obviously looking for trouble with hostile neighbors. A hostile neighboring pair is actually necessary as a valve, as an outlet for aggression. If a pair is quite alone in a tank, the fish will sooner or later start to fight and, in some species, actually kill each other. So, the re-directed activity is still definitely dependent on the re-direction as an outlet of aggression, which primarily is directed at the partner.

From other experiments we know that another cichlid in full nuptial coloration, standing in the middle of the territory, is the most irritating thing that can happen to this fish. Yet, the mechanism just described enables him to tolerate it. And this mechanism is even made so cleverly that the fighting irritation actually elicited by the mate is exploited to enhance the attack at the territorial enemy.

*Hess:* I think there is apparently some question in some people's minds about the term you used. It is being confused with "displacement activity."

*Lorenz:* That is quite important. Displacement activity is something entirely different. I will say it in two words: Displacement activity happens if two mutually inhibiting motivations result in such a perfect equilibrium as to block each other completely. What happens then is that another movement, which is usually inhibited by both of them, becomes disinhibited because the other two neutralize each other.

So, if a bird wants to attack and is afraid in more or less perfect equilibrium of these two motivations, he may start to preen or to scratch, or to perform other activities which are inhibited both by attack and by escape, attack and escape being at the moment mutually inhibited.

This last has been shown quite conclusively by the Leiden people,

particularly by Piet Sevenster and Angela Bol.* It is really the mutual inhibition of the two contrary drives which relieves the inhibition which both of them exert on the lower one.

*Fremont-Smith:* That which each of them exerts?

*Lorenz:* Yes.

*Walter:* Would it be possible in a situation where say fight, flight, and flocking are possible, if fight and flight are equal and opposite, neither would occur, but flocking would occur?

*Lorenz:* I don't know an actual observed example, but it is possible.

*Walter:* It tends to happen with mechanical animals. In a population of artificial animals, this can happen.

*Lorenz:* It might be.

*Fremont-Smith:* With models.

*Lorenz:* I understand, artificial animals. What Dr. Hess wants me to say is that one activity which is being blocked in one direction only, not completely inhibited, seeks another outlet.

*Fremont-Smith:* It is the same activity but directed toward another goal?

*Lorenz:* Exactly! The object is changed, the motivation, the "mood," remains the same.

*Walter:* It is less personal surely? The displacement activity of preening is impersonal and rather formal.

*Lorenz:* It may search for an object. In displacement eating, the bird might find a grain.

*Walter:* It is rather a formality, isn't it?

*Lorenz:* I come to that because this redirected activity actually has become "formalized."

*Walter:* It does start as a personal redirection.

*Lorenz:* It starts as a personal redirection. Of course, there may be some embarrassment about where to redirect it. If the male's attack sort of glances off the female and he looks around for some fish and doesn't find one easily, he may go quite far for another.

One of the most interesting of these fight-suppressing ceremonies derived from a re-directed activity is the so-called triumph ceremony in ducks, geese, swans, and other Anatidae, *i.e.,* in birds with web-feet, and the duckbill and lamellae. This triumph ceremony is obviously a re-directed activity. It consists of threatening movements. In all Anatidae which do have a triumph ceremony, the threatening movement is still recognizable as such, though it may be formalized to a certain extent. As in cichlids, the threat aims past the partner

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* Not published.

which means, anthropomorphically speaking, "I don't threaten you, but let's beat up that fellow over there," whether there is such a fellow or not.

In its most primitive form, this ceremony is found in the Muscovy Duck, *Cairina moschata,* a big black bird with red warts around its bill and eyes. It is quite common in America as a barnyard or ornamental bird. Any two individuals which meet each other and are not sufficiently highly motivated to break out in a real fight will threaten each other and then fend past each other. Occasionally, they will stand for quite some time doing it. This expression movement is not yet ritualized. One bird just comes at the other in a threatening attitude and then gradually diverges. This means "I am not going to attack you," at least, that is the assurance the other bird obviously gets, since he then also threatens to the side and they depart again without a fight ensuing. Any two birds in a colony, knowing each other, may do that.

*Goffman:* They both preserve their fighting honor.

*Lorenz:* Exactly. I was going to say they save their faces. They both have been threatening. Even in *Cairina moschata,* when a new bird is added to the colony, he will be fought. That is to say, the function of this nonfighting or fight-suppressing ceremony has the prerequisite that the rank order between the two birds has been previously established. The lower ranking one still preserves his face. He sort of threatens back. But the rank order must be there, else exactly the same movement is found but directed *at* each other, and then a real fight ensues.

The next step in the evolution of this ceremony is represented by the common sheldrake, *Tadorna tadorna*. In this species, there is a more elaborate ceremony in which the optically effective components of the same threatening movements are tremendously enlarged as to amplitude and frequency, and they are underlined by noise. The drake says "tweet-tweet-tweet-tweet," and the female does the same, in a less exaggerated way, uttering deeper and hoarser notes. In this species, the triumph ceremony occurs only between the partners of a pair. Not any two will do it, but only husband and wife. Moreover, they will only do it when they are really aggressive. The redirection usually results in an actual attack on another pair of sheldrakes. It is a marine duck with a red bill, very beautifully colored, black and white. There is no species of the genus in America. The latin name is Tadorna.

*Freeman:* There is a point on Lake Cayuga called Sheldrake. I wonder if that got its name from some ducks observed there.

*Lorenz:* I wouldn't know if any American birds were called

sheldrake. You know, the robin is not a robin, and so on; the elk is a moose. There might be, though.

*Freeman:* I will talk to Dr. Allen about that.

*Lorenz:* The family does not exist in America.

*Birdwhistell:* There is a dimension of human behavior which we, at Buffalo, have been calling projection. A mover can project his movements past someone, or can put his voice at the point where it is over their heads, or behind them, which forces them away, thus taking more space. On the other hand one can reduce the projection to decrease the amount of space, to make the positioning incongruous. The point is to make it incongruous, not just to control it. This is a territorial matter. It is just that two human beings do not occupy the amount of space their feet or bodies occupy, but the amount of space their communication system occupies, which is significant here.

I have been watching the space competition of mothers and daughters. I suppose the reason I am doing this is because I have a wife and daughter in the proper age range. They engage every morning in a kind of behavior, all of which is overloud and over-extravagant, very disturbing to males. I have found that all the males in our area feel the same way about the "overloud" noises made in the morning by 12-year-old daughters and their mothers. This projection behavior is, in a sense, displaced, and we males begin to get an anxious feeling that the competition is going to be turned on us. I don't know that it is going to be, but I do know I escape from the house almost immediately.

*Lorenz:* It is, at the very least, an analogy. This re-direction is ritualized in a pattern and is different from common threat just in regard to the ritualization. As an example, common sheldrakes do this ceremony only when they are really furious. In other words, there must be a real aggression-eliciting object in the situation. It is seldom that a pair does it when they are quite alone, except in one situation, and that is when they have been deprived of each other and meet again. Then they will do it, even though there be no third party eliciting their attack or serving as a re-direction object.

That is why, quite generally, these aggression-inhibiting ceremonies are called "greeting" ceremonies, which they primarily are not. But because the lonely animal has been deprived of the object of this ceremony, so that the ceremony itself has been inhibited for a long time, he gets a post-inhibitory rebound on meeting that object again. Then they are all over each other with the ceremony which looks like a greeting, but I emphasize that greeting is not the primary function.

*Fremont-Smith:* They don't need any third party on whom to vent their aggression, under those circumstances.

*Lorenz:* No. But, if, on the other hand, they get an excited greeting and a third party comes nearby, they attack it. In the greeting ceremony of cranes, there is a frontal threat posture, the so-called dancing of cranes. Suddenly the bird makes an overemphasized turn, elegantly like a Russian dancer. Then there is a similar ritualized redirected attack on another object symbolizing the mutual enemy. The other object may not be there at all, or it may be a little piece of wood lying on the ground which is taken up and tossed repeatedly. But if there is anything else, better than a piece of wood, the crane would attack that.

*Berman:* Seriously?

*Lorenz:* Yes. But the funny thing, and to me the exciting thing, is the flourish of the turn, of this very imposing threat and "I don't mean you, I mean this chap." In the crane, this ritual is entirely independent of whether there is a third party eliciting an attack or not.

*Buhler:* When he gets to the third party, he gets separated from the partner whom he greeted?

*Lorenz:* He doesn't go far.

*Buhler:* You said "seriously."

*Lorenz:* This is a very pertinent question. You get, in geese, a very short rush, and back. That, again, is why it is called triumphal ceremony because after this sham attack —

*Buhler:* It isn't serious?

*Erikson:* What does the goose do, does he attack?

*Lorenz:* May I first state what the sheldrake does. The sheldrake needs, except in the greeting situation, a real enemy to perform a good triumphal ceremony. The sheldrake needs a real enemy in order not to fight his mate. You can make sheldrake pairs fight by the very insidious procedure of putting a third party in their pen, in their territory, work them up into a furious triumph ceremony and then, by sleight of hand, remove the third party. Then, after a short, very exaggerated performance of the triumph ceremony, they will suddenly bang into each other and beat each other up in a horrible way, after which the whole fight gradually subsides in the triumph ceremony, and they are completely happy again.

That, again, is something very curious, that the ritualized activity, at very high levels, slides back into its unritualized phylogenetic ancestor. My pupil, Nicolai (2), has shown that in several birds, in a very convincing manner.

*Kramer:* Will you comment on one other point, to what extent is the intensity of this ceremony a function of the season?

*Lorenz:* That is a very good question. In the sheldrakes, the intensity of the triumph ceremony is directly dependent on the state of territorial defense during the reproductive season, and it completely disappears with the molt, and reappears only quite gradually in autumn. Just now you are seeing the first hints of weak triumph ceremony, but it disappears when the birds are in a nonsexual state.

*Mirsky:* Can you reactivate it by hormones?

*Lorenz:* We tried it, but we know in geese it goes high if you inject testosterone or estrogen. But the dependence of the ceremony on reproductive season and on the state in which the bird does territory fighting, is something characteristic of the Tadorna-Sheldrake family. With high ritualization, as in true geese, we find that it has become entirely independent of the factors mentioned. The geese do it all year round, even during the molt. They have strong escape motivation because they can't fight, and they cannot use their wings in fighting during the primary molt. But, except for this inhibition, the triumph ceremony is more or less on the same level all the year round.

*Birdwhistell:* Do you have any observations, or any idea of the after-effects of greeting ceremony or identification situation? What I am really asking is how long will this tend to exclude other messages which vary from this situation?

*Lorenz:* You mean how long in size or minutes or seconds?

*Birdwhistell:* Size.

*Lorenz:* In one triumph ceremony or during the season?

*Birdwhistell:* I am asking this badly. I am thinking of the stream of interaction as a relative time. Following an identification ceremony or greeting ceremony, which states something about the material which is to follow, how long, relatively, do we see the aftereffects? Is it short or long? Does it vary by species? How long will this tend to govern any other kind of operations?

*Lorenz:* It depends. In Andean geese, where the ceremony is rather elaborate and slow, it is very long, minutes long. In true geese, it is a few seconds. In sheldrakes it is still shorter. But there is definitely a state of refractoriness against disturbing stimuli. The performance is rigid and mechanical enough as to be impossible to interrupt. A goose that has just had a fight and rushes back to the family, to his wife or lover, in order to perform the triumph ceremony, cannot stop it anymore, which makes it possible for a lover, a one-sided lover loving that goose, to slide in between and intercept that triumph ceremony.

*Fremont-Smith:* And getting the benefit of it?

*Lorenz:* And getting the benefit of it, which is a thing which deserted wives regularly do. They try to get between their deserter husband and his new love, by intercepting Ins triumph ceremony. If they do it intensely enough, they may gain him back.

*Birdwhistell:* This seems to me to be of primary significance. One of the things we have been watching is the inordinate reaction of two people, representing different handshaking types, when they meet each other. For instance, when an American multiple shaker meets the European shaker who shakes hands with a single up and down motion, one tries to keep on shaking; the other tries to get away. You get some interesting aftereffects. One thing that happens is that one or both will put the offended hand in his pocket. Or they may look at their own hand curiously following this experience. It very definitely has an aftereffect which is longer than the aftereffect of comparable messages of that order. What is being suggested here is that this incongruence violates the etiquette which is designed to clarify the greeting-fighting situation. This has important implications for the study of breakdown points.

*Lorenz:* Do you ever get aggression if the ceremony does not fit? That is what happens in geese. I should start by saying, in geese, the triumph ceremony does not take place only between the mates of a pair, but also among the pair and their children and among siblings. Even small babies join in the triumph ceremony, and in everything implied in it. If you let geese foster birds which do not have a triumph ceremony, the non-joining of the babies in the triumph ceremony is resented by the father, to the extent of attacking the babies. This is why families, consisting of foster parent greylags and foster children muscovy ducks, break up at the age when babies are expected to join in the triumph ceremony. They are seriously pecked by the father who takes a more important part in the ceremony than the mother. This is a very fine example of an unsuccessful social ceremony leading to aggression.

*Berman:* I should like to go back to the triumph ceremony, as you described its occurrence in the sheldrake, and this situation in which, let us say, the performance occurs between the sheldrake and its mate, and then it attacks seriously the third party. That is what you were describing. That is what I tried to get clear in my mind. My question: Does this occur under all circumstances? Suppose the attacking sheldrake sees that he hasn't a chance with this third party, that if he attacks, let us say, this very powerful third party, he perhaps will run the risk of being killed. Will it halt this pattern? Is it where individual psychological factors come in? Or is this pattern so

fixed that, regardless of the risk to life and limb, he will carry out the attack on the third party?

*Lorenz:* That is an interesting question.

The answer is that the risk of being killed is not so great, because all I am talking about now is conspecific aggression, aggression against another sheldrake, or a much weaker substitute. He will attack a sheldrake, if there is a sheldrake to attack. He will attack a chicken if there is no conspecific to attack. He will launch an attack into empty space, if there is absolutely nothing. But the other answer to the question is that if a nice, strong, very dangerous object is there to attack, in the situation of pent-up, highly ritualized redirected aggression, the bird will attack objects which he would never dare to attack otherwise. It is a fixed pattern in geese, as I shall explain later. This attack plays a large role in the courtship activities of young males. In this situation, a courageous young gander will attack the most surprising objects, for instance, me. I am regarded as a supergoose, as a quite large, dangerous antagonist, but still more or less as a conspecific.

*Mead:* We still have the picture Dr. Berman brought up, all these other sheldrakes standing around. You have told the story completely from the point of view of the one creature. Are the others wallflowers, or what are they?

*Lorenz:* A number of sheldrake pairs are on that pond, and the other pairs are responding reciprocally. Two pairs are doing the triumph ceremony more or less against each other.

Then, very often there is a re-redirected activity. One makes a sham attack on the other strong pair which is about. In order to get a good, strong triumph ceremony there must be, in sheldrakes, a really aggression-eliciting situation which means another good, strong, territory-preserving pair of the same species. Then there may be the attack of the male on the other male and when he sees that the other is too strong, he may attack a "wallflower." That sort of thing may bounce off, may result in a series of re-redirected attacks. But, on the whole, the answer to your question is that the male is very courageous in this situation, and that he will attack things which otherwise he wouldn't.

*Berman:* Have they ever been killed in those situations?

*Lorenz:* No.

*Berman:* It stops short of that?

*Lorenz:* They cannot kill each other except quite slowly, by constant persecution which is only possible in confined space.

*Walter:* You imply that intraspecific conflict is very rarely lethal?

*Lorenz:* Under normal conditions, intraspecific attack is very

rarely lethal. In close confinement, where the vanquished cannot evade the victor, casualties may occur.

*Freeman:* When one of the animals attacks you, have you ever tried to condition him, to restrain him from attacking you?

*Lorenz:* The film of the Andean geese (which are not geese actually, as they are a kind of sheldrake), shows that the bird will take quite a lot of punishment in this situation without getting negatively conditioned to me.

*Buhler:* You spoke of the ancestor of the ceremony. Do you mean to say originally, genetically speaking, they were actually fighting their partner before they had the sex ceremony?

*Lorenz:* They would fight.

*Buhler:* They would fight their partner?

*Lorenz:* Yes, originally, in the primitive state, they would attack the partner except during the period in which they themselves were so strongly sexually motivated that aggression was inhibited.

Among Muscovy ducks, in which certainly a primitive state prevails, there is no pair formation at all and inhibition of aggression in the male lasts only as long as he is directly sexually motivated. That is what happens in many lizards, and that is what happens in the Muscovy duck.

It is a fair assumption that this is a more primitive state than that of the ceremony linking the pair together and preventing aggression between the mates. This specialized type of behavior is only found in species in which the pairs intensively defend a territory.

*Mead:* I want to get back to this "wallflower." It is hard to get wallflowers into your picture. If I am a very mild, quiet, well-behaved wallflower, I am over here eating something; I haven't got any former wives or present mistresses, or anything, and I am not interested, but I am just at the line of vision when a bird comes by. Is there anything in this bird's behavior which tells me, the wallflower, that this is re-directed behavior, that I shouldn't take it too seriously, and it isn't of the same order as if the bird were really interested in me?

*Lorenz:* Nothing at all.

*Mead:* So, I have to respond as though it were straight fight behavior?

*Lorenz:* Yes. If you don't run from it, you will get an absolutely serious blow from the attacker. Of course, it depends on the fight-eliciting stimuli which you present. If the bird attacking is a male sheldrake, and you happen to be a male, you get a worse whack than if you are a female. If you are a mallard, you are less interesting and less whack-eliciting, etc.

*Goffman:* Can you see it coming and get out of the way?

*Lorenz:* Yes, you can see it coming. I can see it coming 15 seconds in advance.

*Erikson:* In our First Conference on Group Process, when Tinbergen (3) showed moving pictures of gulls, it was so obvious that that wallflower, when it had to flee, fled in an elegant, ritualized way. I actually had a strong impression of a factor of convention there. If that bird would agree to show a minimum of formalized reaction, the attack would be over.

*Lorenz:* If he is a territorial mating gull, standing on his own territory, he would already threaten back if he sees it coming, which he can do as well as I can, and probably the attacker would re-direct his attack to another, and not the strong territory owner standing there. So, he will attack. All he needs is an outlet to save his face.

*Lifton:* Does the triumph ceremony, in addition to courage, give him a greater fighting skill?

*Lorenz:* The fighting pattern is in the baby before the wings are there. If exercise did improve the skill I claim I could see very subtle differences in this, but I don't. It is only a question of intensity. Of course, with rising intensity, the fighting movements gain in amplitude and frequency, and they are more effective.

*Berman:* What about accuracy?

*Lorenz:* I think even accuracy gains with intensity.

*Berman:* Everything gains?

*Lorenz:* Everything gains.

*Fremont-Smith:* I think the question of skill or effectiveness becomes blurred here, but they certainly are more effective. This is the point you are making?

*Lorenz:* My point is they get more effective without any gain of skill.

*Mead:* Is this, then, the analogue? An enraged female, fighting for its young, will fight harder, the greater the threat. Is there a case where in this state a female could overcome a much larger bird, where she would not only attack a much larger bird but actually win?

*Lorenz:* They would actually lick a much larger bird. I will come to that. In geese, of course, the intensive triumph ceremony is there all year long, but it certainly has a peak at a certain moment and that is when a pair has quite young babies, just out of the nest. This peak is necessary as long as the babies are unable to escape. They are still slow walkers, and they cannot be kept hidden in the way in which the nest is hidden. There is no secrecy about them, because they walk about openly and peep. It is obviously of survival value

that the triumph ceremony is then at a peak, and during that time the male is in a state to overpower a much larger bird. Either parent is in a state of practically overcoming any other bird. This fluctuation of intensity is sufficient to compensate for all the differences in size between a Canada goose and a tiny European whitefront.

*Mirsky.* That is in both the male and female?

*Lorenz:* That is in both the male and the female, but in the male it is much more marked.

*Mirsky:* How long does that last?

*Lorenz:* It lasts a surprisingly short time, about a week or ten days. After that the babies are quite fast runners, and then the whole family will run for it if threatened by superiors. But during this period there are very interesting changes in the dominance order of the flock.

*Kramer:* Is that phenomenon also exemplified by two male stickleback fish defending adjacent territories, in which the intensity of the fighting response in any one male increases in proximity to its own territory?

*Lorenz:* It doesn't consist of anything else but a fluctuation of threshold in correlation with nearness of territory center.

*Fremont-Smith:* Nearness of?

*Lorenz:* Of center. I mean the intensity of fighting response increases with approaching the bird's or fish's own territory center and decreases with distance from it. In fish it probably decreases with the square, if you could measure it.

*Walter:* I would imagine this to be an example of a nonlinear relationship, although one tends to think of these things as determined by the Law of Inverse Squares.

*Lorenz:* That depends on the animal: a fish has to defend the two-dimensional surface of a three-dimensional territory, the bird a one-dimensional borderline.

*Walter:* There is probably a region in which the creature cannot recognize an aggressor at all. Beyond that there is a region in which he can recognize movement of something. It may be safe to assume that because there is movement, there must be something living. This may be going too far from the point, but I would like to look for the nonlinear or threshold relationships here because this might account for the size of flocks and the size of territory being strictly limited.

*Lorenz:* Certainly for the size of territory. If you take a fish out of its territory and put it 2 yards away from the territory center, you can confront him with the best possible fight-eliciting dummy; how-

ever, he will have nothing in mind but to get back to the territory, and he will flee even from a female.

*Peck:* I should like to ask a question based on some assumptions which might not be correct. You had better correct the assumption before you answer the question. It is based on the assumption that in any given flock or group of birds, you could, over a given time span, measure the frequency of triumph actions or activities, and the frequency of attack mechanism, and that these will vary from time to time.

In one of the situations that you describe, you seem to be talking about a spread. This is in the situation where there is movement from the mate to the adjoining pair and where, if for some reason, there is not a suitable object available, he moved to another pair. If this is so, I wonder if you could say anything about the different conditions that you have observed, that seem to affect spread as measured by changes, either in the frequency of these two kinds of activity, or changes in the ratio between them?

*Lorenz:* I don't quite get what you mean by "spread."

*Fremont-Smith:* In re-direction.

*Peck:* When it is re-directed.

*Lorenz:* Spread over number of objects?

Peck: Spread over number of objects, *he*. if the first object is not chosen, he moves on to a second. I saw the possibility of spread there, because then you are affecting another pair; in turn, something happens to this pair, and this pair will affect another pair.

*Fremont-Smith:* You mean a chain reaction?

*Peck:* Yes.

*Lorenz:* The answer is definitely yes. Any triumph ceremony in one pair elicits another triumph ceremony in another pair. If, in the winter flock or at feeding time, you have a number of triumph ceremony groups together, and one group attacks another group, and there is a fight between the groups, a third group, which is higher in rank, will resent the mutual threatening between the lower two groups and will rush in between them and drive them apart.

So, if two groups in low rank-order start a dispute, and it is intense enough to elicit the attack of a higher ranking group, you may have a snowballing effect of a triumph ceremony, especially under artificial conditions as in the feeding place, where, at feeding time, very many pairs and groups get abnormally close together, closer than they ever would be in the wild. There can be a snowballing of a fight which involves practically all the self-respecting geese in the flock, excluding only a few solitary wallflowers.

*Peck:* There you have at least two factors, however. You have the feeding and you have the lesser perimeter. Have you had the opportunity to study the impact of the one isolated variable?

*Lorenz:* That is hard to say. Just the spread from one, the distribution of the attack between different groups, doesn't really induce a spread of the response, because the weak individuals won't respond. This is one of the top-ranking animals. One male doesn't dare attack this one, so he gets on to the next one.

*Goffman:* I want to make one point about this business of territory, grace and deflection of aggressive action, because I came across something of the same thing in looking at menial service trades.

*Lotspeich:* What do you mean, "menial"?

*Goffman:* A service occupation can be defined as work done for a price for another in that other's presence. A menial service trade is one in which the work task is thought to be undignified and subordinating or servant-like. When you turn your car over to a car-hop, to a man employed to park cars in a parking lot, you are in his territory and are in effect commanding him to do a task. He may not feel particularly happy about the whole arrangement. And so he may sometimes take your car and with great speed, verve, and precision park it as you could not do it. He shows driving superiority to the client, an aristocratic willingness to take the chance of a crack-up, and a graceful motion. Or you go to a bar and command a glass of beer. The glass may be filled and then set down in an arc-like motion on the bar in front of you, with the same chance at spilling being taken, the same superiority of control being shown, the same graceful motion, as with the car-hop. It looks as if the beer is sure to spill or the car is sure to hit something, but that is merely one's unaristocratic un-chance-taking background showing. Or you plunge into an elevator and without even looking at him, tell the operator to take you to the fourth floor. He may pause a moment to get you feeling that your order has not been attended to, and then with a smooth, rounded widely-spanned action may hit the proper button with a coordination and seeming carelessness that the rider could not manage. Or you order a fried egg in a restaurant while sitting at the counter where the cook can be seen as well as commanded, and you may see an egg broken one-handed with a careless graceful arc-making precision. Oddly enough, it is in these lowly places that grace is found in society. And in many ways this is a kind of deflective aggressivity in your own territory.

*Fremont-Smith;* Ritualized.

*Lorenz:* That is what I was going to say. It is the beginning of

the process of individual ritualization, always resulting in something dance-like, something beautiful.

What I want to point out at this time is the amazing parallel between this individual acquiring of an expression movement and the evolution of an expression movement. The first one takes place in ontogeny, the second in phylogeny, and yet the term "ritualization," coined 33 years ago by Julian Huxley (4), fits both processes beautifully.

*Birdwhistell:* I think the essence of the status and grace point — and I have talked this over with Dr. Goffman —

*Mead:* In human beings?

*Birdwhistell:* Yes, in human beings. If you examine behavior of Southerners and New Englanders of the upper strata, you will find that they are taught to be "extra graceful," when dealing with people of a lower social standing. Probably it is a bi-directional thing and relates to status generally rather than just from lower to upper.

I think this is very well brought out when you see the kind of concept of grace which is included in the statement, "He is the kind of man who will shout at a waiter," which indicates he is behaving inappropriately. "He doesn't know how to handle a maid or butler" is a statement of this order. The man has not yet incorporated the grace demanded of a secure status position.

Also, with reference to the nature of grace: grace may be ex-examined in behavioral terms. We have been running trajectories on dancing and other acts described as graceful behavior. Figure 11

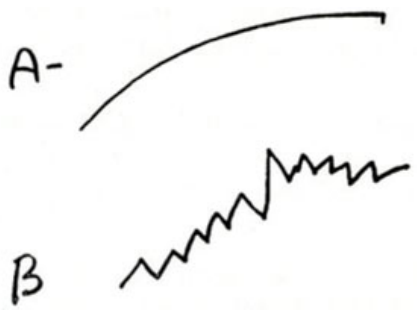


Figure 11.

shows the following kind of behavior: Note B and A as trajectories of an arm or leg or body. A is a smooth curve; B is the zigzag line. The sizes of these zig-zags are unimportant. It is the shape of the movement with which I am concerned. A and B express the same trajectory. However, ultimately trajectory A shows minimal variation or adjustment within the scope of the trajectory. In A there is a minimum of messages being reacted to in process. This is "grace." In B multiple messages are being introduced into the system and there is the zigzag. The things we call graceful are always multi-

message acts in which the secondary messages are minimized, and there the role of the whole is maximized.

*Peck:* I should like to point out the relationship of this to what Dr. Bavelas told us earlier about what people did when they anticipated they were going to have to communicate the pattern on the grid. Essentially, what he said was that they eliminated the secondary aspects in order to improve communication. This is of considerable interest to me since, if we take what Dr. Goffman called to our attention about urban and city populations, there are conditions apparently in an urban population which, let us say, make a stranger who comes in feel awkward. Another way of saying that is he can't find movements or signals which are graceful or easily communicated.

*Walter:* I have a comment to make on the mechanics of this. Grace may be the result of efficiency in a goal-directed movement. In the case of an artificial animal or guided weapon, the early guided weapons and some modern ones, when they are searching and are not goal-directed, have a trajectory with a messy curve like B. They perform a hunting movement, which looks quite random and is certainly not very graceful. It is jerky and disjointed, incoherent, often a series of cycloid loops. But the moment the goal or target is perceived, the trajectory becomes a graceful parabola or hyperbola. So, the appearance of a goal will transform a graceless and exploratory mode of behavior (which may have a high information potential in it, in the sense that it is looking in many directions) into one which has only one bit of information, if the target is there, but looks smooth and pretty.

*Blauvelt:* This answers a question asked in the previous conference. What qualities of instinctive behavior make it appear like skilled behavior? This graceful, ballistic movement is characteristic of both.

*Lorenz:* May I jump in with an important thing Dr. Peck hinted at, and also Dr. Birdwhistell? Of course, with the elimination of the noise in the movement, when the movement becomes graceful, it becomes more unambiguous as a signal. This is where a man tries to simplify the curve, in order to be better able to transmit it into words. That is exactly the situation in which the communicating system of expression movements is, because the receptor part of the system, whether IRM or learned Gestalt, has its limitations with regard to pregnancy. The more pregnant and simple the movement is, the easier it is to take up unambiguously by receptor. Therefore, there is a strong selection pressure working in the direction of

making all signal movements, these releasing movements, more and more graceful, and that is also what reminds us of a dance.

*Birdwhistell:* Before we use straight efficiency curves, one other thing must be added. If you are dealing with a social system and you put in a so-called graceful person, who is called graceful in a social situation, you may very well introduce tremendous trouble into the system, and you get too graceful in a hurry. One of the interesting things is that so-called graceful people, *who are called graceful,* and who have a high number of the A-type movements, often do not make good social dancers which demands that they dance with someone else and engage in close interaction with other people. Perhaps this is because they tend to set up a circular response with themselves and thus do not do the required minimal searching which makes dancing possible.

*Fremont-Smith:* Graceful with respect to what?

*Mead:* There is one other point. Dr. Lorenz came to hear some things, too. He occasionally enjoys what other people say.

*Liddell:* He wanted to hear something in relation to his main point, mating.

*Mead:* This is a relevant point to what Dr. Birdwhistell said, too. Under hypnosis you get the same sort of grace we are talking about, and you get it in trances which are, again, instances of knocking out the noise, as you have expressed it. You can fit it into the same picture.

*Lorenz:* The center of interest of what I wanted to present here is the homosexual and heterosexual pair formation in geese; however, I have a film that I might describe briefly although this will doubtless interest many of those present less than our discussions.

The bird that is shown is not a goose. It is called a goose but it is really a sheldrake. It is one of the species which may be called Sheld-geese. They are of the family of sheldrakes but fit in the ecological niche of geese in South America.

This film shows fighting behavior and a triumph ceremony of highly ritualized type. I don't know how it arose, but it is so madly ritualized that just showing the film saves me three-quarters of an hour trying to describe what ritualization is. It shows a pair of geese occupied with social preening, social grooming. It also shows the courtship call of the male, which is derived from a head shake, and the preening female and the courtship calls. The birds became excited about Niko Tinbergen, who was standing at the other end of the pen, and they approached him threateningly. The gander got flatter and flatter and broader and broader, and turned into a sort of flatiron. These birds can bring this about by raising the shoulders

of the wings, the wrist joints. Displacement shake is also shown. The birds actually move very slowly, like a slow motion picture.

The birds are shown making-movements of approach toward the hostility-inciting object (Tinbergen), very slowly, very tense; this is very threatening. The threatening behavior of bulls is very reminiscent of this slow approach of the gander; the female is more afraid than he is. She shows displacement preening all the time, "embarrassment"; the subjective side of displacement activity is best expressed as "embarrassment."

Tinbergen is shown closing in, and now *he* is embarrassed. Now Tinbergen attacks, and retreats. Now the gander stands broadside-on. That attitude is extremely like that of a bull.

She preens. I purposely left all gradations of intensity in the film.

*Berman:* Would she be doing this, too?

*Lorenz:* She would if she had no male. A female without the male will be more aggressive and do all this the way the male does. The film shows the broad shoulders, the wings, coming out of the feathers, ready to beat up Tinbergen. After taking this film, Tinbergen was black and blue all over from the gander's attacks which went up as high as the gander could reach. The position of the wings is beautiful. The shoulder of the wing, as shown, has a horny projection at the carpal joint.

The triumph ceremony is also shown. After an abortive attack, it becomes strong, and finally the reach attack comes, and Tinbergen gets black and blue. Tinbergen held a little stuffed stoat, which was then presented to the bird. The bird is shown "killing" the stoat. The bird took it in his bill and smashed it with his armored carpal joint until the stoat was "dead."

I was dressed more carefully than Tinbergen, and I was pursued by the gander, also.

*Berman:* Is there anything sexual in this behavior?

*Lorenz:* No. It may look so, but there certainly isn't. Not the triumph ceremony. If that isn't a ritual, I don't know what is. Again, I just elicited an attack and then I fled, in order to elicit another triumph ceremony. Then I jumped out of the pen. When I was successfully "chased out" of the pen, there was the most intense triumph ceremony of all.

*Lotspeich:* What is the meaning of her participation in this?

*Lorenz:* The female's participation just means that she acts as the center of territory to be defended.

*Liddell:* She does what?

*Lorenz:* She signifies that she is something to defend.

Now, I want to get on with the triumph ceremony of the true

geese because what I really want to present you with is the very curious phenomenon of ceremony the "normal" function of which is the formation of heterosexual pairs; may also result in homosexual pair formation and in group formation beyond the pair. A whole grade of geese may result from these bonds, who come together in a very queer way.

*Mead:* Do you mean homosexual or monosexual? Are these actually sex-linked pairs or friends?

*Lorenz:* These are sex-linked pairs of males who do not know that the others are males. They are not homosexual in the true sense of the word; they simply "mistake" each other for females.

*Mead:* But they continue to mate with females?

*Lorenz:* No, that is the joke. I must explain to you just a few things before I go on. The triumph ceremony in the greylag goose has become largely independent of the original conflict situation. As it thus becomes independent of sexual motivation, which still is necessary in the Tadorna, the sheldrake, it has largely become independent from season. It is performed the year round. It is present even in tiny babies. The first coordinated movement a baby goose can make after having been hatched is a low-intensity triumph ceremony. In the very first days the re-direction of the triumph ceremony is not yet very precise.

Therefore, it may be mistaken by another baby for a true attack, and you get, by this misapprehension, by this miscarriage of information, fights between siblings during the very first days of their life, which is highly interesting. Later on, this triumph ceremony forms the bond. It is not only the expression of a bond existing between any two birds, but in itself represents the bond between two geese of any sex. But there still is the original element of aggression and a certain remnant of sexuality discernible in the triumph ceremony. In other words, geese who develop, for some reason, a very intensive triumph ceremony with each other are, at the same time, more apt to react sexually to each other, even if the two are males. At the same time, they are absolutely prevented from fighting each other. The triumph ceremony, the bond existing between two male greylag or Canada geese, absolutely prevents any fight between the two partners, even if one of them does, to the other, the most intensely fight-provoking acts. For instance, one very fight-evoking act would be to rape a friend's wife. Even this situation did not elicit an attack in two snow ganders which we have on record. Both snow ganders, being brothers, still had the family triumph ceremony in common. One of them got married quite normally but, under the circumstance of captivity

which induces an abnormally high degree of intimacy, still maintained the family triumph ceremony with his brother at an age at which it normally is extinct.

So this first snow gander, whose name was Paul, had a wife who was already sitting on her eggs. Now, snow geese have the very objectionable habit of trying to rape the incubating wives of other ganders; however, they are very polite with their own wives. Normally, this raping of another's wife is prevented by furious defense on the part of the husband.

Whenever Paul's brother, whose name was Red, approached the nest on which Paul's wife was sitting, Paul would rush up to Red in a frenzy of aggression, drive past him, by virtue of the strictly ritualized re-directed activity, and beat up a third party, a poor "wallflower," while Red went on peacefully raping Paul's wife.

*Fremont-Smith:* This is because they shared the triumph ceremony?

*Lorenz:* Exactly. Paul simply could not defend his wife against Red, because he still had the fraternal triumph ceremony with him. In our geese, in our greylags, we found an amazing number of homosexual pairs; two ganders who would be giving triumph ceremony to each other, also would try to tread each other, both trying to mount simultaneously. Then they usually have a slight lover's tiff, slide back again into a very peaceful triumph ceremony, and no breaking up of the pair formation is ever effected through the inability to copulate. We thought, for a time, that Heinroth (5), who described mating behavior of geese in detail, was wrong, and that geese just mate by chance, and very gradually get discouraged from trying to mate with a partner that won't lie still and be copulated. This was because the intimacy of our geese was too great, and the intimacy of all the geese in the flock, by being kept together, so they skipped one ceremony, which is the only mechanism which makes for heterosexual pair formation.

In the threat movement of a goose it stretches the neck forward. Everyone has seen this in a domestic goose. If there is a great amount of escape drive, or of fear counteracting this threat, then the head will be pushed backward and the neck bent. This is inhibited threat, fear-inhibited threat.

Let us forget aggression for a moment. Pre-copulation activity consists in bending the neck in a graceful arc, like a swan, and then dipping the neck into the water. We know about its evolutionary history, which is complicated but needn't concern us here.

If a young gander normally leaves his family and begins to court a goose, in the wild or in our bigger lake, he almost invariably, statistically, most frequently chooses a perfect stranger to fall in love with. The stranger is a better object with which to fall in love and at which to direct sexual courtship activities than is a well known bird.

What happens then is a ceremony, an attitude which we call the angular neck ceremony. The angular neck ceremony, quite clearly, is a supposition of sexual movements plus attack movements, plus escape movements. It is just the superimposition of these three movements. What results is the neck being stretched forward at the base, then drawn upward by the arc neck ceremony, but pushed back by fear. If there is much aggression in it, the bill may point forward again. This movement, the angular neck attitude, we did not recognize for a long time, and Helga Fischer, my co-worker, didn't notice it until we happened to get, by chance, two new ganders who were perfect strangers to the colony, and who were afraid of all the geese and courted with the angular neck. It was only then that we found out what it meant and recognized it as an independent ceremony. It looks similar to the bow neck, and if we ever saw the angular neck before, we confused the two ceremonies.

Now we know the answer to the question why at first, that is to say in our set-up in Buldern, with a small flock of geese and in confined space, we got so many homosexual pair formations in males: All the birds simply knew each other too well. They were too intimate with and too little afraid of each other to do the angular neck ceremony which indubitably entails a strong element of fear, of escape drive, and apparently cannot be released if that element is absent. Then the angular neck ceremony is skipped and any two geese who sort of like each other may offer each other the bow neck with neck-dipping or the triumph ceremony without any more ado. A gander will respond to the neck-dipping of another much more intensely than a goose will, so, from the point of view of responsiveness, he is an even better object to that ceremony than a female is. Thus, before the poor birds know what has happened, two males have an intensive triumph ceremony together and cannot get rid of each other any more, because the frustration by not being able to copulate is so small, is so inefficient as compared to the enormous emotional pressure of the triumph ceremony, that they just can't get apart any more.

These poor chaps, of course, have no outlet for sexual activity, and what happens now is very funny: They have love affairs with

real females, that is, some of them, not all of them. One poor female offers a triumph ceremony to a male because with females the linkage between triumph ceremony and copulation is much more fixated than in the males. Females find it much more difficult to copulate with a male, with whom they have no triumph ceremony, than a male, vice versa, with a female.

So, these homosexual ganders are always very dominant because, as I said, triumph ceremony increases aggressiveness. Without the triumph ceremony, the bird has, in a manner of speaking, no territory; it is unable to become aggressive. As two males are more aggressive than a male and a female, simply by virtue of their fighting potentiality, such a pair of homosexual ganders will beat up any gander of any normal pair and are, therefore, very impressive to the girls, and the girls will very often fall in love quite particularly with such a pair of homosexual ganders. You will get, then, two homosexual ganders who are followed everywhere, but at some distance, by one female or even by two females who want to get into triumph contact with one of them. These females are then also ready to copulate.

When such a pair of homosexual ganders starts their neck-dipping ceremony, the female will approach, and approach close. One of them would probably chase her but they are so occupied with themselves she can approach. They get more sexually excited, and when they try to mount each other the female will crouch invitingly near by and then it happens sooner or later that one of the ganders gets on the female and copulates.

So one of the two homosexual ganders learns to copulate with a particular female. What he does then is the most unchivalrous thing. After copulation, a normal pair gives an intensive triumph ceremony. In these homosexual pairs, the gander will, after trying to mount his friend, look around, see the female, rush over to her, copulate with her, go back to the other gander and have the triumph ceremony with him. It is very strange.

Two things may happen, or quite a number of things may happen. The two ganders may be separated by the very intensity of the triumph ceremony because, at very high intensities, as I said before, the ritualized redirection ceases to operate, and at the height of the triumph ceremony the two ganders slide down, get less and less redirected, until you have two ganders threatening each other. If the right level of threshold is not reached, the whole thing may slide back into tremendous triumph ceremony. But on rare occasions this results in the most fearful fight you can imagine, a fight lasting half an hour, while the maximum duration of fight ever

observed in any other case between two adult greylags is of the order of 10 or 15 seconds.

After this, these two hitherto homosexual friends are bitter enemies and remain so for the rest of their lives. I should also like to mention the protocol of the so-called quartette. The first thing that happened was that two ganders -

*Fremont-Smith:* These are greylags?

*Lorenz:* They are all greylags. I am choosing the greylags as examples because they are clearest in my mind. The two ganders, Max and Kopfschlitz, were born in '51. In '53 we thought they were a pair, until we saw they tried to copulate with each other. We didn't know much then about what I have just explained. They were neck-dipping constantly together. They were very dominant.

In '54 a third one had gradually approached them who was particularly attached to Max. This bird was Odysseus. The names arose automatically. Odysseus had flown away from the colony for several months and had come back quite alone, by himself. To the best of our knowledge, he was in Southern England with a flock, and he was the only one to return. He is a very small and ugly bird, not very masculine at all. Kopfschlitz gets his name from having a scar on the top of his head from flying into barbed wire twice in quick repetition.

Max and Kopfschlitz were absolutely inseparable. Odysseus was clearly courting Max, who gradually got sufficiently habituated to him to respond to his offer of triumph ceremony, but their relation definitely remained one-sided. Then Max was gradually approached by a female, Martina, who even then was past normal mating age, having lost her fiance a year ago. Martina followed the trio of ganders, at a respectful distance of 2 or 3 yards. So this group had a queer structure, centering about Max. Max was in love with Kopfschlitz and vice versa. Kopfschlitz is big and fat and he does not copulate at all. We never saw Kopfschlitz copulate except once, which was 6 years ago. We know he is a gander, as we saw his penis in this one copulation. So Max has some excuse for still thinking Kopfschlitz is a female. Odysseus had little to do with Kopfschlitz but was furiously courting Max. Martina was very much in love with Max also, but being a female, she could only follow him about shyly, always keeping her distance. Very gradually Max began to love Martina and it was then that Odysseus grew very jealous of her and began to chase her. In the Spring of '55, we got the following picture: Martina was swimming along in a frightened way, with three ganders in pursuit. Helga Fischer was not clear why they hated Martina so much now. I saw that Max was trying

to give a triumph ceremony to Martina, but the other two thought he was going to attack her and, on top of it, were jealous of a new member of the group. Odysseus, particularly, always got between whenever Max tried to approach Martina. Helga Fischer didn't want to disturb them because she wanted to have clean protocols, but I wanted to see what happened. I persuaded Helga that we should catch Odysseus and Kopfschlitz, which we did one evening at feeding time. Quickly I made a football tackle at Kopfschlitz, and Helga at Odysseus, and we carried the two of them into two compartments of an aviary. We missed the results because, when we looked around, we could just see Max and Martina giving the post-copulatory ceremony. They had copulated while we were still busy locking up the other two. So, my theory was correct. We left the two of them locked up and Max and Martina nested. She laid three eggs, but they were driven off the nest and nothing resulted. In Autumn it was still the same thing. The three ganders were keeping together. Nobody persecuted Martina, but even Max didn't pay her any attention. She just tagged along at a distance of thirty feet after the three happily triumphing ganders.

When we moved to Seewiesen in the Autumn of '55 this was still the situation. However, in March '56, late one evening, I just happened to see the fight between Max and Odysseus, which I have just described, the fight which arose out of the maximum intensity of the triumph ceremony.

But now, as often is the case, I must tell a parallel story. While Kopfschlitz had learned that Max was uncopulatable and had resigned himself never to copulate at all, Odysseus did nothing of the kind. On the contrary, he contracted a love affair of the type just described. His co-respondent was a goose named Sina who, being three-eighths domestic, was very highly motivated sexually. Such partly domestic geese are much more prone to copulate with a partner with whom they do not have a triumph ceremony than pure wild ones are.

So Sina was something of a nymphomaniac, at least as compared to a wild greylag. She had dates with Odysseus at very strictly predetermined times, just about noon, when the two of them met on a certain part of the pond, copulated, and immediately went on their different ways again. Odysseus hurriedly rejoined the two other ganders again and performed the post-copulatory triumph ceremony toward Max.

Sina's story is interesting in comparison to that of Martina, because it began so differently and yet had the same happy ending. Sina at first was not at all interested in Odysseus except to copulate

with him; she just met him as described, for a minute only. This state of affairs lasted the first mating season of their liaison, that is '54. But next year, Sina started to tag along after the ganders, as constantly and at an even greater distance than Martina, all through '55. In March '56 there was that historic battle royal between Max and Odysseus, late at dusk. The next day, when I looked up the vanquished Odysseus, to see whether he was depressed, I caught him in the act of giving a passionate triumph ceremony to Sina. The two of them have been happily married ever since; they raised four children in '56 and six in '57. In other words, they are at present the most successful pair in our colony.

And now to return to the story of Max, Kopfschlitz, and Martina. I must say a few words concerning Martina's background and previous history. She is a small, weakly goose. She was rickety as a baby and correspondingly received much special attention. Thus, she became somewhat abnormally attached to humans and something of an outcast among geese. She did some neck-dipping at me when she was a year old, particularly when I fished for Daphnia; apparently she took my net-dipping as a substitute stimulus for neck-dipping. She is a 1951 bird, one year older than Max and Kopfschlitz. When our geese migrated in the Winter of '53 she and one other female of her age group came back; her then fiance, Martin, did not. This made her even more of a recluse. Neither in the Spring of '53 nor in '54 did she show any sexual activity whatsoever, but in the Spring of '55 she fell in love with Max, as already told, and they made an unsuccessful attempt to breed, which, incidentally, they probably would not have done if we had not imprisoned Odysseus and Kopfschlitz. In the Spring of '55, after the break between Odysseus and Max, I expected that she would rise in Max's favor, which she did not, remaining just as inactive sexually as in the year before. Indeed, most of the time she did not even keep company with Max and Kopfschlitz, who were completely taken up with each other but moved about in solitude.

This state of affairs still prevailed in the early Spring of '57, when Max and Kopfschlitz were still disregarding Martina completely, giving the triumph-ceremony to each other, and trying to copulate with each other. But at least she was tagging along after the two ganders again, thus proving at least some interest in Max. In spite of the almost continuous watch we were keeping, none of us ever saw him copulating with her. He must have, though, on some occasion, as she later laid fertile eggs. But when the house-hunting ceremony began, Max and Kopfschlitz performed together a very well-defined sequence of behavior patterns which determine the nesting

and completely ignored poor Martina. In this ceremony, it became grotesquely apparent that each thought the other was a female. In this connection it is necessary to remember what I said about the function of the angular neck and that, having "skipped" this particular pattern, the birds have no information that their partner is not a female. One of them would stand proudly in a potential nest site, clearly "expecting" the other to sit clown and scrape a nest cup, which, of course, no gander ever does. Each was expecting the other to start laying eggs.

On these house-hunting expeditions the birds roam far and wide. The two ganders often flew over to another lake, some miles distant. We were quite anxious and nearly decided to clip their wings. Later we were glad we hadn't done it. Martina never flew along with them; she was obviously discouraged. But nevertheless she started laying. She had established a very small and modest little territory round a forgotten nesting box at the far end of the lake. The two ganders were still roving all over, house-hunting, when Martina began to incubate.

Then one day, when house-hunting was already on the decline and drive to mount guard at the nest, which is also a function in its own, was beginning to increase, the two ganders suddenly discovered Martina, who had already been incubating for a number of days. One afternoon quite suddenly both of them mounted guard before Martina's nest. As sitting goose, Martina had a new valence.

While the copulatory stimuli she sent out had very little effect on Max and none at all on Kopfschlitz, the stimuli emanating from the sitting goose and eliciting the nest-guarding in the male, succeeded in getting both ganders, Kopfschlitz and Max, equally attached to Martina. They both stood guard at Martina's nest and both offered her a triumph ceremony, whenever she came out, not only Max but also Kopfschlitz.

At present, the triumph ceremony among the three of them is completely symmetrical. Martina is not afraid of Kopfschlitz any more; she answers to his triumph ceremony as well as to that of Max. Yet, the triumph ceremony between Max and Kopfschlitz is still more intense than between Max and Martina. They are a perfectly happy *menage á trois*. Kopfschlitz never copulates. To the best of our knowledge, he hasn't copulated for 6 years. Max is the father of the two children that hatched, but Kopfschlitz is more intense in defending the family than Max is.

I have another trio; a pair of ganders, one of which married a goose, the whole thing in a slightly different way, leading to a

completely symmetrical triumph ceremony among all three of them, and one gander never treading at all.

*Peck:* I didn't understand or didn't get the importance of the angle neck to recognition. I didn't understand how it got dropped out in this particular group.

*Lorenz:* The angular neck is the only motor pattern which the goose does not have, which is exclusively characteristic of the gander. In another gander it releases fighting. A young gander trying to approach a girl who is still going with the family, is chased by "father," who resents the stranger who is forever coming too near the family. The family is like a territory. Strangers are resented near the family.

*Fremont-Smith:* This evokes from the female a different response, and he knows it is a female. Is that right?

*Lorenz:* The female responds to angular neck only by slight neck-dipping, in "coy" behavior. She just looks at the courting gander. During the first stages of courtship, the response of the female is pretty nearly restricted to eye movements.

*Fremont-Smith:* This is the way he recognizes that she is a female and recognizes -

*Lorenz:* No, I think it is rather the other way around. It is the way all ganders recognize she is not a gander. Every gander would respond to angular neck by attack, and the female responds by coy behavior.

*Fremont-Smith:* Therefore, if it is not male, it must be female.

*Lorenz:* Yes, exactly.

*Fremont-Smith:* This is the thing that protects this kind of male pair formation under ordinary circumstances; if they are not so close together, they don't skip this one.

*Lorenz:* Exactly. The prerequisite to doing the angular neck ceremony is that the bird is sufficiently strange to the whole family group of the female to be afraid and aggressive against them.

*Fremont-Smith:* If they are too close together, they lose that.

*Lorenz:* If they are too close, they start the bow necking and copulating.

*Walter:* Would you say that in the early stages Martina provided "Tea and Sympathy" for the two ganders?

*Lorenz:* Yes. You see, these things are anthropomorphous, if you describe them in the most neutral terms accessible, and I assure you that I am not anthropomorphizing geese but am "goosemor-phizing" humans.

*Bateson:* Do you know that these complex social molecules do not occur in a wild flock?

*Lorenz:* Of course, they may, and you see what we call "normal" pair formation, meaning the angle neck pair formation, has been described by Oskar Heinroth (5), just by intuition, as the "normal" But, of course, what is normal? Two-gander families are often successful. It is well worth it, to the species, to have two ganders, because the defense of the family is so perfect. Immediately after we found all this, I asked Peter Scott whether he found that in the wild population of pink-foot geese which he studied extensively in Iceland, and the answer was yes. On ten or twelve normal pairs, you get one trio with two ganders.

*Fremont-Smith:* About 10 per cent.

*Lorenz:* In our colony it is much larger. Just less than half of the families of greylags and snow geese have two homosexual ganders for a center, but that is due to previous history.

*Fremont-Smith:* Now they are on a larger pond and you get less?

*Lorenz:* On a larger pond and with more families, we get much less than that.

*Buhler:* You said that the domesticated goose was willing to accept copulation without the ceremony. Is this Martina a special kind of goose that she would accept it? Is it only a special kind of female that would accept this situation?

*Lorenz:* When a goose is in a state of high sexual motivation, she is more ready to dispense with the triumph ceremony.

In domestic geese, the situation is shifted by a changed rate of maturation of the single functions. The domestic goose is sexually mature at 1 year, the normal greylag not until 3 years old, very rarely at 2 years.

This shift in maturation, the normal process of functions relieving each other effect a change in the domestic goose. Aggression and triumph ceremony mature rather later than in wild geese, while sexual responses mature earlier. Sina, being a quarter domestic, was at just the right age where her need for triumph ceremony was still in the future, while her need for copulation was already high. So she was just fitted to be "sucked into" the needs of the group, to use Dr. Redl's term.

Martina is exactly the opposite. She is pure wild, slightly weak, and sexually less highly motivated than a normally healthy, strong wild goose. But she did not dispense with the triumph ceremony. She was intensely ready to give the triumph ceremony with Max whenever he offered to do it. Such a readiness, on the part of a female goose, may remain completely latent for long periods, as the female cannot by any means take the initiative and offer a

triumph ceremony to a male. That never happens, not even in domestic geese. And a wild female may offer copulation straightforward rather than a triumph ceremony. All she can do in her state of readiness to give it to a certain gander is to tag along behind him, at a modest distance, waiting and waiting for him to take notice of her. I have known geese to do that literally for years on end.

What I wanted to bring out, and obviously did not quite succeed in doing, was the entirely different primary motivation which, in the cases of Sina and Martina, first brought the goose into contact with the male whom she later married. With Sina it was, at least at the beginning, the drive to copulate alone; with Martina it was exclusively the need for a triumph ceremony partner. Yet both of them ended up in a perfectly happy union, fulfilling both wants. The higher sexuality of Sina finds an objective expression in the number of progeny, which is thirteen, three born out of wedlock in '55 and four reared with Odysseus in '56 and six this year, while Martina boasts only two live children of '57.

There is something else that might interest Dr. Buhler in connection with her question: In domesticated, or partly domestic, geese the abnormally early maturation of sexual activities may result in what is externally perfect Oedipus behavior. I can make an Oedipus any time I wish. I need for this a slightly domestic mother who in Spring gets into season slightly earlier than her wild husband. Then, next year, the domestic children become sexually active before the husband does. In the domestic geese the dissolution of family bonds, of family triumph ceremony, takes place at the normal age, but sexual activity occurs earlier than normal. So there is sexual activity at a time when family triumph ceremony is not yet dissolved. If the father is wild and does not begin copulating earlier than March, the sons invariably will copulate with the mother during later Winter. It is a lack of exact timing which is responsible for these disturbances in family life. I can reproduce this experimentally. We had it repeatedly with the setup of a wild gander and domestic female, and the domestic sons of the two. With those, we very often found mother-son copulations.

*Buhler:* One last question. All the Martinas are of this type?

*Lorenz:* The wild ones, yes. They may be sexually more active than this one but, on the whole, you may say that pure wild female greylags are not ready to copulate with a male with whom they are not also ready to give a triumph ceremony. Their readiness may be quite latent. I suspect it whenever I see a goose spatially linked to some gander, tagging behind in a group.

*Bateson:* What is the sex ratio in a flock of domestic geese? The male mates with the whole group?

*Lorenz:* If anyone doubts that the bond of mutual love between two such geese who refuse to attack each other, who are aggressive only in the presence of each other, who would search for each other, etc., is something which can be objectively described in neutral terms. I call his attention again to the parallels which exist between these personal ties and those ties which bind an animal to a certain home area or territory. When displaced, it shows the same loss of aggressiveness, exactly the same searching behavior, the same homing behavior, and also the same decrease in very many other activities and, last but certainly not least, the same changes in the vegetative nervous system.

In a goose deprived of the triumph ceremony, or even a single goose which had the bad luck never to perform a triumph ceremony, particularly a hand-reared one, all the symptoms of a markedly decreased sympathicus tonus are found. The goose moves less; it holds its body less rigid. It does not keep its feathers smoothed down, but fluffy and disheveled instead; its eyes look small, because the eyeball sinks into the head. All these symptoms are particularly dramatic in a goose recently widowed or deprived of its triumph group, or single partner.

To make the picture of "grief" complete, then there is the same withdrawal into itself, and inability to form new social contacts. Geese who have had bad luck, who have been widowed repeatedly, often show permanent, visible change in their facial expression, particularly around the eyes, because the eyes are sunk in and give you, actually, the direct anthropomorphic expression value of grief which, in this case, happens to be an entirely correct impression.

If I may repeat what I think is the most remarkable part of what I told you, it is the role played by the triumph ceremony in the social structure of geese, particularly if one draws into consideration its phyletic origin. This is a behavior mechanism which evolved out of pure aggression, which still is motivated mainly by aggression in some species (remember what I said about sheldrakes) and which still retains the outward appearance of aggression even in its most highly developed forms, except, of course, for that "little detail" of ritualized re-direction. And yet this mechanism has developed the function of not only inhibiting aggression between certain individuals, but of forming, between them, a bond which, in all its objective behavioral particulars and in all its sociological consequences corresponds to what we call love, in the highest sense of the word, in human beings. I have said, at the very beginning

of my presentation, that no comparable bond ever exists in any species that is entirely devoid of intraspecific aggression. Perhaps this is some hint as to why love and hate are still so obviously close together in humans.

In its most highly developed form, in the true geese, the triumph ceremony is almost but not quite independent of sexual motivation. Though certainly evolved by the selection pressure exerted by the necessity of pair formation, it has developed into a mechanism of group formation beyond that primary function. There are triumph-ceremony groups whose members are just good friends. For instance, it happens regularly that the nonbreeders, the 1- and 2-year-olds, just by virtue of being banished from territories, flock together and may develop triumph ceremonies. This certainly happens in the wild. The fact that two ganders may develop a triumph ceremony involves the possibilities of all the disturbances of which I have spoken. The amazing thing to me is how different ways led to successful reproducing groups, whether there are two ganders or only one.

*Mead:* Several times you used some phrase like "angle neck." When you get two of these angle neck groups, that is, a male meeting a strange male, what is their relationship to each other? How do you distinguish friends from these homosexual pairs?

*Lorenz:* Two ganders making angle necks at each other will simply fight. The angle neck is unambiguous male display.

*Mead:* When they found out they are both males?

*Lorenz:* Then they fight and they turn their backs on each other.

*Mead:* And they never become friends?

*Lorenz:* No, not with angle necks. The angle neck is definitely repellent to another male; it is fight-eliciting in another male.

*Mead:* If a strange one?

*Lorenz:* The arc or swan neck precedes or accompanies neck-dipping and denotes sexual mood, but it gives no information whether the goose is of male or female sex.

*Mead:* When a strange gander comes in and gives this angle neck response, which tells the other gander that he is a male and not a female, there is no danger of forming these triumph formations, then, if he stays around in that territory and they get used to each other? Then will the angle neck disappear, or will it continue?

*Lorenz:* If, for some other reason, the two get acquainted, then the angle neck will disappear, but it will have to disappear weeks or even months before they get intimate enough to do anything else, either sexual activities or triumph ceremonies.

*Mead:* They become acquaintances. Then, after a while, the angle neck disappears. Then can they become friends?

*Lorenz:* Yes, they can.

*Mead:* They are friends, in which state there is no danger?

*Lorenz:* No, they have forgotten that long ago. They have forgotten the other one has said weeks ago, "I am a male."

*Mead:* So they could become a homosexual pair afterward?

*Lorenz:* They could become a homosexual pair. Once the intimacy is sufficient for triumph relationship, the danger of forming a homosexual pair is always there.

*Mead:* Didn't you say that because of the intimacy of the close situation, which was closer to family or incestuous relationship, the absence of the angle neck among the males, in this continuing family group, was a —

*Fremont-Smith*: Protection.

*Mead:* Not a protection, but the opposite; it increased the chances of forming these homosexual pairs.

*Fremont-Smith:* The absence of it.

*Mead:* How about the females? Do they form friendships?

*Lorenz:* That is a very important thing. The activity of the female in neck-dipping and in making advances is so small, so inconsiderable, that female friendships have never been recorded in our colony, except between domesticated ones. But then, in the domesticated ones, there is usually true male behavior, which we have hitherto not observed in pure wild ones. Among some hybrids of wild greylag and barnyard geese, a pair of females tried to copulate with each other as early as the spring of their first year. The same thing happened with swan geese. The two "ganders" which were trying to mount each other in one of the pictures actually were two female swan geese with a domestic mother. Both of them reproduced successfully with a male, after being separated. I sent one of them away in order to break up the homosexual female pair. But we have yet to see a homosexual female pair in pure wild-blooded ones.

*Mead:* How about polygamy and co-mothership?

*Lorenz:* We have had in our protocol one group with two mothers. I had better tell the story which concerns Otto, Verena, and Röschen. Verena and Röschen are two sisters who, to my eye, are indistinguishable. I had better mention that I know most of the older geese by their physiognomy, not the younger ones; still I make many errors in confusing two brothers and sisters.

When a male starts making an angle neck at a family with several daughters, he often is not quite clear himself which of the girls

he means. Then, very often, it may happen that two girls of that family respond.

*Mead:* And he is stuck?

*Lorenz:* Then, very often, he chases one away and concentrates on the other. That is the normal proceeding; this is what Otto did. But another gander, Adolar, was handicapped in the same way I was; that is to say, he could only tell them apart if both were present. We have a greater number of protocols where Adolar approached with triumph ceremony, bow necking, neck-dipping, and other sexual approaches to Röschen; then he saw Verena, and immediately turned away from Röschen and went on neck-dipping with Verena. This happened again and again. If we removed one, everything was perfect; he didn't notice that one was missing. We did that experiment. We shut up Verena for a short time, and he was quite content with Röschen. Then Verena nested and laid. With nesting, there begins a new ceremony, a new sound or utterance matures, the so-called nest call. I needn't go into details of what that is.

For one week he knew Verena, because she alone was nest-calling, and he knew it, so he rejected the other goose, who did not nest-call. But a week later, Röschen started laying and nesting in the vicinity quite near to Verena. He didn't love her and he had only taken part in the house hunting with Verena — Röschen had had to find a nesting site by herself and he did not even know where it was.

*Freeman:* Do your animals ever get experimental neuroses such as Dr. Liddell's sheep and goats used to?

*Lorenz:* Under certain circumstances. I can tell you unhappy love stories where frustration brings about something like neurosis or depression.

But to keep to this story, Verena's nest site was the one he had found, chosen, and around which he had demarcated the territory. When Röschen was pausing in incubation, going off to graze and to bathe, he would rush up to her, give the triumph ceremony to her and follow her about, accompany her as a gander will a goose on incubation. He would then pause and lead her back to his nest. There he would find Verena sitting on the nest. He would pivot around and chase Röschen away with particular fury.

Röschen lost her children, because she hatched them a week after Verena had hatched hers. At a week's age, young greylags are quite fast on their feet, and poor Röschen tried to keep up with Verena's family, but her two newborn infants weren't up to it. It was cold weather. We had to take away Röschen's infants because they would simply have died of exposure. We had to hand-rear them, but we succeeded in getting one of them re-accepted by Röschen a week

later. She, of course, walked with the Adolar-Verena family, trying to mother their children. But she recognized and accepted her own baby.

One prerequisite to that happening is that Röschen and Verena, being sisters and only two years old, rather precocious in that breeding season, still had a mutual triumph ceremony, so Verena couldn't actually attack Röschen. If they had become estranged before, so that Verena would have had the possibility of attacking Röschen, the difficulty wouldn't have arisen, but because they also were sisters and still had a family triumph ceremony, Verena simply couldn't chase Röschen away. Adolar, because he was a stranger to both of them —

*Mead:* This throws beautiful light on incest taboos all the way through, and their usefulness in society.

*Lorenz:* Later on they flew away, in Autumn '53, and only Röschen came back. She is married to a snow gander now.

*Buhler:* I would like to come back to the friendship question. I had gotten the impression from you that friendship was a different relationship besides homosexuality. In your answer to Dr. Mead, it seemed to be the same.

*Lorenz:* You are asking a very disagreeable question because the triumph ceremony as such, as found between brothers and sisters in a family, certainly does not imply any sexual relation. But in late summer when the animals aren't in the reproductive state, it wanes to a certain element of sexuality in all these relationships. But, on the other hand, even the babies give triumph ceremony, and in this there is quite a considerable amount of aggression, but practically no sexuality.

*Buhler:* There is no friendship without sexuality?

*Lorenz:* Much as I dislike saying it, there isn't, at least not in sexually active adults. I should concede there is a slight element of sexuality in it always.

*Walter:* The points you outlined about the importance of these homosexual pair relationships, and even more complex networks, in the formation of tribes which would also promote the stability of mating-pair formation at a secondary level, seemed quite relevant to the structure of contemporary human society. You remember that you and I have argued whether men and women are wild, tame, or domestic animals. I would say the amount of wildness varies over a wide range; looking at it sociologically and anthropologically in European and American societies, it seems to me there is a smooth gradation between wildness and domesticity both through the classes and nations.

I would say that middle class English people are tame wild animals in the sense they are not greatly influenced by their neighbors; they may not even know their neighbors. They don't have cafes to go to; they live in their own houses and live an independent though conventional life. In that sort of culture, it is common to find a kinship society. This makes for marital stability because there is an absence of free and easy social interchange. There is no

neighborliness; there is no cafe society as in France, but instead a wide variety and richness of quasi-sexual relationships. Whereas American urban society or French urban society, where either neighborliness, on the one hand, or cafe population, on the other, are of the essence, these complex relationships are relatively rare, and, what is more, are not necessary. The point you made about these secondary structures being justifiable, on the ground of uniting mating pairs, seems to me the essence of this point.

*Mead:* The Eskimos are a good example of this sort of thing. Among people who live alone for a very long time, with very slight political organizations, wife-lending is common. The stranger, who may have to be fought when he arrives to be sure where the strength position lies, may be absorbed temporarily into the group. Also, among a group like the Kaingang in South America the only way a stranger can be added is sexually; a stray woman is attached to a man, or a stray man is attached to a woman. The complex sexually linked social molecules you are talking about result. But I am not happy, Dr. Walter, about the distinction between wild and domestic, in this sense. I don't think that is helpful.

*Walter:* Dr. Lorenz, you mentioned the difference in the character of wild and domestic geese.

*Lorenz:* The difference in the character of wild and domestic geese is just that the accent in domestic geese is more on direct sexuality, on copulation as such. There is simply higher intensity of copulatory activities from neck-dipping to actual copulation, and in consequence of that, copulatory activity in domestic geese is more independent of triumph ceremony activity than of —

*Mead:* But, Dr. Lorenz, you have also made the point that domestic geese have no style, they are not life-long monogamous; they don't grieve for the spouses; they have no manners, no style; they have no form as compared with wild geese.

*Lorenz:* The overexaggeration of sexuality results in that. It is just a consequence. What you say is perfectly correct, but this lack of ceremonial is at least partly a consequence of the low threshold of all sexual activity. The gander does some neck-dipping. The correct thing for a wild greylag goose would be to look away. When he has

been neck-dipping some weeks, she will give one neck dip which looks as if she is actually feeding under water; in other words, only when she is actually feeding, a slight amount of tendency to neck-dip becomes overt. But the domestic female will respond by immediately inviting copulation.

*Birdwhistell:* I am trying to get the model straight. Are you defining domestication as standing in contrast with wildness where you have only the one system which runs according to one social logic?

*Lorenz:* I mean something much more simple. I mean genetic properties which you find in domestic animals, genetically fixed behavioral traits characteristic of domestic beasts and birds.

*Walter:* For which they have been deliberately selected.

*Lorenz:* Fat production, eating, nonselectivity of IRM's is very important for utility and easy breeding. If you want to mate a pair of domestic geese, you just have to buy a goose and a gander, and you are quite sure they will mate, because they aren't selective about falling in love.

*Buhler:* Have any geese ever rejected a gander who tried to —

*Lorenz:* Of course.

*Buhler:* How is that?

*Lorenz:* I don't know.

*Buhler:* How do they do it, run away?

*Lorenz:* They just don't respond to the advances of any male.

*Buhler:* What are the reasons?

*Lorenz:* I don't know. We have geese which are 4 years old and just don't like any male that happens to be there. It may be that you buy a new gander and next day you find this hitherto rejecting goose falling in love with the new gander.

*Goffman:* Is this related to the fact the goose doesn't have to pick its mate?

*Lorenz:* It is the loss of structure. The moment you remove selection pressure, the beautiful protective coloration of a species immediately disintegrates. They aren't as homozygous. Mayr (6) has shown impressively that wild species aren't half as homozygous hereditarily as you would think, but their great uniformity is apparently kept up by severe selection pressure all the time. The moment this pressure is relieved, the muscular tonus drops; you get more lazy; you get fat, etc. This is what practically all domesticated animals have done immediately after having become dependent on man.

*Liddell:* You once characterized that as becoming slipshod, free and easy.

*Lorenz:* It is a disintegration.

*Walter:* You can't call a race horse slipshod.

*Lorenz:* The race is an argument in my favor because wherever the selection done by man is anything as strenuous and severe as in the wild, the stigmata of domesticated slipshodness do not occur. There may even be super-wild animals, in a manner of speaking.

I had a collection of pictures of domestic animals as opposed to their respective wild ancestors. Just to show how noble the wild ones are, and to show it is just selection that does it, I insidiously brought into that series two pairs of pictures, in which the sequence was inversed, the domestic animal taking the place of the wild one. The first of two pairs were a wild wolf and a greyhound, the second a wild Prcewalski's horse and an English hunter. In both cases, the characteristics of the wild and the domestic animal seem inversed. The "wild" characteristics appear "beautiful" to us, and the domestic ones ugly. The screen hero, the cheap novel hero and the "Nordic" ideal of Nazi ideology are all catching, because they have the leanness, the muscles, in short the external "nobility" of the wild.

That the characters of domestication are really brought out by selection alone, and not by other environmental factors, is very well borne out by the case of the European reindeer which the Lapps have domesticated though they don't live in houses.

A herd of reindeer which is big enough to support a given number of Lapps is too big to be herded by them. The only thing the Lapps can do is to run after the reindeer, which they do. The only change in the life of the reindeer is that among the Lapps in winter, many families, join in the round-up, rounding up the reindeer in certain parts, where they can protect them against wolves. The other selection factor is that the Lapps cannot put up with old cantankerous fighting males, so they go on breeding males from young that are still inoffensive and castrate them as soon as they get too dangerous. So nothing has been changed in the life of the reindeer; they eat the same plants, and they go on migrations as they did before human interference. The only thing that is changed is something in natural selection. The wolf has been removed, and older males which would ordinarily be the fathers of progeny have been eliminated. Nevertheless, this species shows any single character (of course, not very well marked) but still clearly recognizable in the typical domestic animals, shorter legs than the caribou, a slight potbelly, less production of antlers, blue eyes, light skin, etc. One is quite assured that what we call domestication is a change in hereditary characters, which occurs in any species the moment the natural selection which has operated hitherto is removed.

*Mead:* Dr. Lorenz, I also think it useful to recognize the fact that

there is a kind of correlation at the learning level, in peasant groups, primitive groups, and upper classes, where a very large amount of behavior training goes into the possibility of selecting a male, as compared with what there is in urban societies. Since Dr. Walter's point is such a nice correlation, and appears to cut across it, we are going to have to keep very straight or we will get completely mixed up, because what you are talking about is really a highly domesticated group living in a kind of artificial isolation where the rest of the world is a forest for these middle-class families. They live a little bit more like Eskimos, each family on an island, keeping to themselves. There is quite a contrast between urban behavior and the small number of signals that a working-class man, in a city at large, needs in order to pick up a working-class girl, as compared with their peasant forebears where they may have had to court for years before they got the right girl, or an American plains Indian where it may take 5 or 6 or 8 years while the boy just makes a little sign and the girl, once a year, carries a red ear of corn which cheers him up for the next year. This is like the greylag geese, and it is, of course, learned behavior so highly patterned it is impossible to mate with someone who doesn't have the same behavior.

*Lorenz:* This, again, shows the immense parallel between learned ritualization and evolutionary ritualization. De-ritualization, through domestication, proceeds along very much the same lines and produces very such analogous phenomena as the de-ritualization brought about by civilization, or "citification."

But I should like to finish what I was going to say to Dr. Buhler: The high rate of sexual activity alone made for disintegration of highly complicated patterns, because where, in the Hopi Indians, there is a very long and complicated series of activities which are necessary in order to attain the goal of final copulation, for the citified human or for a domesticated goose there is a simple short cut. On the first sign of neck-dipping of a male, this goose spreads herself out flat and invites copulation. It really is a shortcut. Shortcuts happen all the time.

*Walter:* The wild male would accept this? He is not offended by her submission?

*Lorenz:* He is ambivalent about it. The usual thing for the wild male to do under these circumstances, which happened of course again and again, and happened more often when we had more domestic geese, is to copulate with the female, beat her up and chase her away, to persecute her immediately afterward. That is regularly what happens, if he is trapped into copulating with her.

*Fremont-Smith:* Which ones do this?

*Lorenz:* Greylags.

*Peck:* I think you said you had seen several times the wild father, the domesticated mother, and then the partly domesticated children. In these instances you said you had several times noticed incest behavior. Did you follow the impact of these on later life of the children?

*Lorenz:* No, I didn't. The reason was that the two times I found it, the father was a Canadian and the mother was a semidomestic greylag. Then the son copulated with the mother. We didn't keep the hybrids because they were uninteresting, and we were too crowded. The same thing would, of course, go just as well with a wild greylag gander. It is not essential that this was a Canadian. Maybe it is slightly better with the Canadian because the Canadian has a breeding season slightly later, so that the discrepancy between his getting into reproductive state, and his wife getting so, also, is greater than it would be with a greylag.

*Kramer:* Is it correct to refer to this as Oedipus behavior, as was done earlier? In this case, copulation takes place between the mother, the domestic goose, and her semidomestic sons. In the human Oedipus complex, as far as I know, there is only the element of emotional attachment, which might be likened to only one element in the pair formation of geese, namely, the triumph ceremony. So there is a certain inaccuracy in referring to both examples — the case of these geese in which the triumph ceremony and sexual relations take place and the case in humans where only the element of emotional attachment is involved, as Oedipus behavior.

*Mead:* "Incest" is a better word. This is straight incest. This shows conditions within the family structure which permit incest to occur, against which there are normal protections, if you don't have the hybridization.

*Lorenz:* The normal protection being, normally, that the family intimacy is shunted off, switched off, before sexual activities are switched on.

*Birdwhistell:* One of the earlier theories (7) about incest stated that house kin, house familiars, are forbidden. This was thought to be the original conditioning factor for the prohibition.

*Mead:* Also, in this country, with certain ethnic groups, there is a greater frequency with cross-marriage. When a European peasant marries an American wife, the danger of incest goes up. The mother does not know how to protect the daughter adequately against the father. There is something the mother doesn't do that she ought to do. There are certain places where social workers know that they

are going to run into certain types of dangers with cross-ethnic marriages.

*Frank:* It exists in Baltimore. Maybe it is moving from the country to the city that breaks up the pattern.

*Mead:* There is considerable incest among the groups that come. That is a loss of patterned behavior. It isn't domesticity.

*Goffman:* The norm here is not incestuous relations.

*Frank:* The mother and daughter wouldn't come into the clinic complaining about it if it were normal.

*Mead:* The norm may be that a higher number of incestuous relations would occur in other groups. Every day in the world there is a little incest, as far as we know, but there are great differences in the amount of incest from one society to another.

*Birdwhistell:* It may be the actual reduction of uncles and aunts in the situation who introduce signals that prevent it from happening.

*Goffman:* It may be the potbellied males who are the ones who make the most wild and aggressive occupational choices and the ones who are the most fastidious about the kind of jobs they have, whereas the persons who are in physical trim may be the ones who are not very discriminatory about the kind of work they are willing to accept.

*Mead:* We are not making a direct transfer here in physical type; we are making transfer between genetically set patterns of behavior, on the one hand, and learned patterns of behavior on the other, which are tighter and more precise in the wild.

*Lorenz:* Dr. Goffman is completely correct. Not even in domestic geese or half-domestic geese can it be assumed that the one with the potbelly is always the one with the greater de-ritualization of behavior.

*Freeman:* I must protest again this implied correlation between body-build and occupation. I wonder if Dr. Goffman has seen the many laborers who have large potbellies. They have what some call a "beer-belly."

*Kramer:* Would some comment on the elements of pair formation be appropriate here, that is, the combination of the triumph ceremony plus actual sexual relations being the two elements that seem to be necessary for good pair formation?

*Lorenz:* Exactly.

*Kramer:* Will you make some additional comments?

*Lorenz:* I think Dr. Kramer is mentioning something which ought to be mentioned, that is, of course, the independence and the dis-sociability of these two functional cycles, triumph ceremony and

copulatory behavior. They can be dissociated experimentally, and they do dissociate on their own accord, under certain circumstances, as we have seen already. Yet, both of them develop their full survival value only when functioning together. The whole system of the pair formation through triumph ceremony we may still consider the "normal" way. If the male makes an angle neck and offers a triumph ceremony, and the female answers his triumph ceremony, then they are a bethrothed pair; they may not copulate until 2 years later. In wild life, this certainly is the most frequent pattern in which a male and a female are fixated on each other. Also, the female, who doubtlessly selects her partner according to the rites of the triumph ceremony, is of course, exerting a selection pressure in the direction of a good defender of the family, because, all he does — all his showing off, his sham attacking, and his triumphing with the girl of his choice — is nothing but anticipation of family defense and, actually, it consists of the same motor patterns which he will perform later on as a father of a family and which are tremendously necessary for the acquisition of a territory for successful nesting and rearing of the brood. So, of course, triumphing and copulating form one functional whole, although both are more or less independent of each other as regards their physiological causation.

By the way, this dissociation of triumph-ceremony and copulation, of love and sex, seems to throw at least some light on a question which intrigues me very much, and that is whether Man is primarily a more or less monogamous, or a completely promiscuous animal. If, in some civilized and not taboo-bound society, true statistical records were taken of who is or has been copulating with whom, I believe the conclusion would be reached that Man is completely promiscuous. But if, on the other hand, his highly ritualized behavior patterns of falling in love were watched, this queer and sudden object-fixation, which is so much like imprinting, being effected just by exposure to the object, without the necessity of reinforcement through consummation, if the extreme emotional value of this process, as testified by songs and poems in all languages, were considered then there would be a tendency to think that Man is "meant" to be monogamous and true to the object of one great love, just as greylags are.

And this assumption becomes more probable by the following consideration: the human mechanism of falling in love is clearly an instinctive one and also a highly differentiated one and there would not be any sense, any survival value in it, if it were not coupled with a high degree of monogamy and fidelity. The selection of one particular individual for a mate with whom to reproduce, obviously is

only of value if the best one available is selected and if one sticks to his choice. If one falls in love indiscriminately, every few weeks, then the result obviously is in no way biologically different from unlimited promiscuity. So the very existence of an intense and violent falling in love argues that human beings primarily were monogamous and that the modern citified promiscuity is just one more of the phenomena of de-ritualization, of which we have already spoken.

It could, however, be the other way round. Man could be primarily promiscuous and could be on his way to evolve a goose-like monogamy. If you ask me in which possibility I really believe, my answer is that I simply and flatly do not know. What I would like to know is how anthropoids, particularly chimps, behave. There are indications that they can fall in love. The scientists in Orange Park, Florida cannot give us an answer either because as yet they haven't devised a setup in which a number of chimps can be watched as a chimp society in free intercourse.

Editor's Note: Dr. Kramer would like to add the following "afterthought" to his remarks at the conference:

Pertinent to this discussion, and helpful toward an understanding of what is meant by good pair formation, are two incidents which occurred within the space of one hour, during the nesting season at Seewiesen this year. I accompanied Dr. Lorenz on a daily round of the nesting boxes on the lake. As we rowed toward one nesting box in the middle of the lake, Dr. Lorenz pointed out that this was the nest of a greylag goose which had been deserted by her snow gander husband.

We passed from this nest toward another near the south margin of the lake, where a white-front goose was swimming back and forth in front of a white-front gander standing guard on the platform of his mate's nesting box. "There is an unmarried goose," Dr. Lorenz said, "trying to get herself a husband. Let us watch them for a few minutes." We watched for some 10 minutes while the goose swam back and forth and the gander remained on guard. Then, since nothing more occurred, we turned about and started to row away toward another nest, when we heard a terrific commotion behind us. The guarding white-front gander was chasing the unmarried goose. He came at her furiously, beating her with his Wings, chasing her again and again, every time she settled in the water, until she had escaped to the other side of the lake. Then the gander returned to his nesting box, ruffled and shook his feathers into place several times, and quietly took up his guarding duties once again.

Then Dr. Lorenz called my attention to the nesting box that we had passed earlier. "Look," he said, "isn't that remarkable? The snow gander, who deserted his greylag wife for several days, is back." I turned, and there was the snow gander standing guard on his nesting box, as if he had been doing this for days. Not only that, but when another pair of greylag geese came too close to his nest, he went at them aggressively, chased them off, then returned to his position of guard on his nesting box. Meanwhile, his sweetheart greylag goose, Dr. Lorenz pointed out to me, was now swimming

idly at a discreet distance of some 30 to 40 yards behind the nesting box. For awhile, it seemed as if the snow gander was oblivious of her, and he continued to guard the nest. Then, quite suddenly, he left the nest platform and swam directly toward her. As he approached her, he slowed down, circled around for several times, and then the snow gander and his sweetheart greylag both swam off together.

I had been uncertain, when the snow gander swam toward the greylag goose, what his intentions were, and when I mentioned this to Dr. Lorenz later, he said, "The snow gander himself didn't know what his intentions were; there was some aggression in his posture as he swam toward her, but he is too much in love with his sweetheart now. When he came near her, his love predominated over his aggression."

I should mention the fact that this snow gander returned to the nest again, when his goslings were born and, about 4 or 5 weeks later, together with his greylag wife, his greylag sweetheart, the five goslings, and another white-front gander without a family of his own but who wanted to play father, had evolved a close social unit. I am sorry that I will not be in Seewiesen to see what will happen to this unit, during the 1958 nesting season.

These two incidents, one in which the gander guards his nest persistently, and the other in which the gander deserts it, beautifully illustrate, I think, what is meant when reference is made to "good pair formation." They impressed me with the fact that the problem which Helga Fischer has been studying at Seewiesen, namely, what are the elements which make for good pair formation among geese, is not only a very real one, but an extremely important one biologically. The reference to "good" pairs is not made in any moral sense, but in the fundamentally biological sense that certain analyzable elements contribute toward the formation of a strong bond between a pair of geese, and that such a strong bond, once formed, has survival value for the species in terms of successful nesting and successful defense of the brood of goslings against enemies and predators.

*Mead:* Would you go a little bit further in this tribal situation and the aggregation of groups? Haven't you some material where you took half the geese from one place, and the others languished for them at one point?

*Lorenz:* No, that is a slightly different story. Those left behind languished sadly, just because the others were removed. Dr. Freeman asked about neurosis. If you remove parts of the population of geese, the remainder get something like an anxiety-neurosis. They are afraid, day and night, and hardly eat, and their state of health goes down, because they are thrown in such a state of continuous activation of escape drive.

*Fremont-Smith:* Panic.

*Lorenz:* It is a continuous panic, a continuous lowering of all escape-eliciting thresholds. That is the nearest approach to neurosis I have ever seen in geese.

*Birdwhistell:* This is without splitting pairs?

*Lorenz:* The mere fact that a great number of people you know

have unaccountably disappeared will bring on this condition. I have been told by an Army man and by Air Force men that the greatest heroes are thrown into panic by the gradual disappearance of members of the group; the gradual disappearance of members of the group is the thing which human courage finds hardest to stand up against.

*Walter:* Particularly if they are removed by posting rather than by death. In the Royal Air Force, the morale remained high though they might lose 30 per cent of their number every day by being shot down, but if an apparently healthy operations officer were transferred by higher authority from that squadron to another, or from that flight to another, then morale would fall.

*Mead:* The other example for this, is that of the concentration camp children that survived, such as the ones that Anna Freud brought to England in the Bull Dog Bank project. Those children who lost parents and all else, traveled as a group. They became enormously dependent on each other. When one child was taken out of a group to be sent to a hospital, the entire group was thrown back into the worst state they had ever been in. It was something the therapists knew no way to protect them from. This would be equivalent to what has just been mentioned by Dr. Walter and Dr. Lorenz; it would not be removal by death. They learned to deal with death. It may be, of course, that the groups that have learned to deal with death are the most vulnerable to the non-death removal.

*Buhler:* I should like for a moment to get back to the incest question, which disturbs me. Is this an impression, or do you have statistics to base it on, because, from my very limited experience, I would be entirely on Dr. Frank's side?

*Mead:* I don't know what you are challenging, so I can't quite answer you.

*Buhler:* I challenge the statement that there is more incest in intermixture of nations or races.

*Mead:* I said there are certain ethnic groups in which this is an expectation by social workers in this country, when there is a cross-national marriage.

*Buhler:* Has this been established statistically as a reliable trend?

*Mead:* It is established in experience, and we know what the correlates are quite well. There are certain primitive groups where there is far more incest than in others. There are societies, of course, where marriage with a third cousin is incest, and in which there is as much of a fuss.

*Buhler:* I mean now the father-daughter relation.

*Mead:* There are places where father-daughter incest occurs more

often than others. There are places where mother-son incest occurs. It is, on the whole, the rarest type. There are places where all the surrogates occur, for example, stepdaughter incest, which is one version of the father and daughter incest. These vary from one society to another. I am not saying they always occur with hybridization. I was merely citing an instance where, in a particular bit of cross-national marriage, some protection is evidently missing. It is a protection that no one wants to have missing, but it is missing.

*Buhler:* In a particular bit, not in all of them?

*Mead:* I simply was making the statement that these events occur often enough so that experienced social workers expect them in certain groups and not others, and that they correlate with other types of behavior, characteristic of these nationality groups. I think Dr. Frank will agree with me, that one of the standard complaints by the social workers in the clinics, is that when certain types of rural Southerners, from very rural regions, are brought into urban regions, there are cases of incest.

Here again these people have been removed, as Dr. Birdwhistell says, from the positive protections that existed in the home environment, and no one in the new environment takes over the protective role which prevents them from engaging in incestuous behavior. *Tobacco Road* was a story about how easily these things can fall apart, and that was one reason for its appeal; it shows how very vulnerable such groups are to removal of any kind of protection.

*Birdwhistell:* Most of the Southern white migrants have not been the flatland whites but the Piedmont whites, those out of the hills. These two groups should be sharply separated. When there is a movement out of the Piedmont into the flatland, it is comparable to the situation which occurs when there is a movement from the Piedmont to Gary or Detroit. The actual operation of the social controls in the Piedmont area is one in which there is a very strong, warm familial relationship, of a very high order: in the case of a girl, with her mother's brothers; and in the case of a boy, with his father's sister. There is a tougher relationship, in which one tends to merge, it isn't nearly as sharp in some primitive tribes, between a mother and her sister, between a father and his brother. It is part of the reward situation if you remember that this is a highly Puritan situation in which a mother, to show affection, will pinch you and tell you to eat. Your aunt, on the other hand, will feed you and hug you and, not play with her own child. This, in a sense, forms a personal cushion.

When you look at these people in Detroit or Gary, the absence of this moderating-force leaves everyone very, very confused as to the

way to handle these situations. I don't know the incidence of incestual occurrence. I know something about the number of times it is complained about. I don't know what they are complaining about; I don't know what the words mean. I don't know what behavior has gotten improper because there is very little behavior permitted of a warm, close nature. It would take very little to make it dangerous. A father cannot exhibit the behavior to his daughter that the mother's brother is allowed to. A mother may not exhibit the behavior to her son that a father's sister is permitted to display. The moment any of that comes in, even though it is not an actual coitional act, it can suddenly turn very improper and very guilt-ridden. I don't know the statistics for actual coitus; I just know the complaints are there.

*Frank:* While we are talking on sociologic grounds, Dr. Lorenz mentioned there is some relationship between crowding and homosexual pair formation. Is there any analogy? Are there more homosexual activities in cities than in rural areas?

*Mead:* There are more in total institutions, we know, where there is extreme constriction, but these are usually associated with the absence of members of the other sex. Even so, I should say there is probably more homosexuality in total institutions where people are crowded tightly together, on ships for instance, than there would be among a group of male rangers who cover a very wide territory. That would be the sort of analogue one could consider.

*Kramer:* There may be another factor which would relate to this. Dr. Lorenz, you remember when the ducks and geese were moved from Buldern to Seewiesen, and the subsequent incidents in which homosexual pairs, which had existed for 4 or 5 years in Buldern, broke up in Seewiesen in the spring. We talked about that a little bit and thought that perhaps one of the factors contributing to the break-up of these homosexual relationships was that the vitality of the ducks and geese was much higher in Seewiesen than in Buldern. Perhaps the general vitality of the animal may be a factor in not tolerating a homosexual relationship. Will you comment on that?

*Lorenz:* You are quite right. My answer to Dr. Frank is that, in the case of the crowding of these geese, the crowding itself did certainly not promote homosexuality. It was caused clearly and unambiguously by the skipping of the angular neck ceremony. There were no strangers; everyone was intimate, so there was no cause to be afraid of anyone. Therefore there was no angling, and that was the only ceremony eliminated. That is the whole story.

To come back to what Dr. Kramer said, it is very probable that if we have the best possible captive, or even semi- or quasi-captive

population, it is still not quite as healthy as a really wild one. I suspect that, if we could improve substantially the state of health of all homosexual ganders, they might start beating each other up, at the peak of their immense triumph ceremony; this may be a regular method to break up homosexual pairs. We have actually seen this twice, in four homosexual relationships; two broke up and two remained. Of course, as time wears on and these chaps are together longer and longer, the likelihood of their getting into a fight becomes less and less. But it is quite correct that a slight drop in the general state of health which precludes this righting may result in the persistence of homosexual pairs.

But I want to tell Dr. Frank another story of quite different birds. In the American wood duck, we apparently can produce permanent and incurable homosexuality just by rearing drakes, males, in the exclusive company of other drakes. This happened by pure chance.

Our wood ducks, by inbreeding, are of rather low viability. We have new wild ones from the United States now, and we hope to better our stock. But in our old wood duck stock there was a very high baby mortality. Most of the girls died and only the boys survived. Thus, we reared two boys, two male wood ducks, last year, hand-rearing them without a mother. They were only in each other's company. This year we reared four. Hitherto, all have been persistently homosexual. We shall see what happens later on. We shall try to cure them by forcing them singly into female society.

*Hess:* I should like to add to that. When Mr. Ramsey found a number of homosexual mallard pairs in our setup in Maryland, we checked the records and found that these were some he had saved from imprinting experiments, something which we do not ordinarily do. These were, of course, in our particular experimental situation, animals that had been imprinted on a male mallard rather than a female mallard. Normally, of course, a female mallard brings them up, and they are imprinted by her. We don't know for certain whether this will hold up. We are actually going to watch for this now in the future.

*Lorenz:* What would happen if one female sibling had survived? I am going to try this out.

Perhaps it is the mother that plays the role. After all, it could happen that a normal wood duck might rear four sons. I don't think, in the wild, these four sons would become homosexuals, so, I am quite sure in this case it was the absence of the mother and the presence of male wood ducks exclusively that caused the unnatural situation. But still I think this is an indication at least of the possibility, that, in some cases, something similar may happen to boys,

if they are reared without the mother, say in a monastery, with only male persons taking care of them, and only males for siblings.

*Torre:* Did six of them pair off or find another six ducks and mate?

*Lorenz:* They made advances to other drakes, but the normal drakes rejected them, and they were thrown back more or less in each other's company. Last year's two and this year's four keep together.

*Goffman:* I should like to make a comment about one of the interesting points that is being raised here. You are almost suggesting a distinction between the object of sexual activity and the role-coloring of this activity. Your homosexual gander is not behaving, as we might say, "swish"; he is behaving very much like a male but with a male instead of a female as object. Middle class people, in looking at the phenomenon of homosexuality, very frequently link or identify object with role-coloration. But we know that in jails and other "total institutions" where homosexuality can be a systematic part of the culture, the person taking the male sexual role in the homosexual relation is ordinarily not thought of by the other inmates as being homosexual. In fact he can be thought to be performing the most male role available in the institution. It is one sub-class of objects for his activity that is thought to be of questionable sexuality. Perhaps most males in some jails are persons who refuse to give up sexuality. They pick the best looking young boy that is available and use him for sexual purposes. In this they do something that is not homosexual, at least as defined within the group. So in taking what outsiders see as a homosexual role, these men are behaving somewhat like one of your ganders, and are being more male, in some respects, than the other males.

*Lorenz:* That is quite correct. All of my homosexual ganders fall into this class. In the case of these two males, Max and Kopfschlitz, each "thinks" that the other is a female. None of them can have any information as to the male sex of the partner. They attempt to tread each other quite normally, as they would tread a female, and each is slightly puzzled if the other doesn't crouch.

*Goffman:* This is a hard thing for middle-class social scientists and even some middle-class psychiatrists to appreciate.

*Lorenz:* Obviously what we call homosexual is composed of a large variety of phenomena. One may be a complete man in every behavioral regard, with only his choice of object disturbed, and another may dress in a female way and want to be treated and to behave like a female. This happens in some birds, too, but the interesting thing is that, as far as I know hitherto, geese never do it. A

male gander cannot perform female activities while the female can, to a certain extent, perform male activities.

*Mead:* These greylag geese are way over on the value of aggression side. If we were going to look at the whole of society and use your material as an analogue, there are some societies where the dissociation between aggressive behavior, and warm, gentle, affectionate behavior, may be the difficulty. So, you have a group of males who want more gentleness and warmth than they are permitted in their relationship, if they are to behave exactly like a male.

There can also be a type of relationship and a type of homosexual behavior, a stereotyped one, that Dr. Goffman was talking about, that is on the opposite side, with a lot of males behaving in a way that will be interpreted, especially by a group outside, as feminine.

There are two cultures where these two contrasts show up clearly. Among the Iatmal the emphasis is on every male being active. There is a great disapproval of passive behavior. The closest thing that exists there to what we will call, psychiatrically, homosexual attachment, is when a man lets a more passive man sleep with his wife, or when one manages to have an affair with the wife of the man he admires very much. This is, of course, the familiar triangular situation. Any little Iatmal boy who shows any tendency toward passive homosexual behavior is given a stick and is told, "Now, you fight." No one is allowed to be passive. However, when they go out as work-boys and mix with indentured laborers, with other tribes, the Iatmals may become homosexually active.

In another group I worked with, the Arapahos, the boys go around with their arms around each other; everyone lives in a nice sort of tangled up, warm, friendly set of relationships, but the idea of actual homosexuality is unknown to them. They become very easy homosexual victims in the work-boy situation, however, where their behavior will be interpreted as female.

*Kramer:* A type of homosexual behavior also takes place, I might mention, in cockroaches. There are some elements similar to those Dr. Goffman mentioned. In one species of cockroach, *Nauphoeta cinerea,* the newly emerged adult males, when isolated with each other, attempt to court one another within 2 to 3 days after they have become adults.[*] They direct the courtship behavior, that is normally necessary to invite the female over the male, at other males.

*Lorenz:* You must explain that the female mounts the male in these animals.

*Kramer:* Yes. The normal sequence of events is as follows: The

[*] Research supported by a John Simon Guggenheim Memorial Fellowship. Not previously published.

male approaches and "antennates" a female, then turns around near the female and raises his wings, thus exposing secretions from tergal glands on the abdomen. This is the male courtship response. The female usually approaches these secretions and begins to "feed" on them, gradually working her way further and further over the abdomen of the male. At a certain point in this behavior the male extends his genitalia and attempts to clasp the genitalia of the female. If he succeeds, he then moves out from under the female into the typical end-to-end copulation pattern seen in these insects. Roth and Willis (8) have described similar behavior for other species of cockroaches.

If females are introduced among these isolated males, the males will prefer to court females. But if there are no females, the males will court other males. No clasping attempt is normally made, however, until the "feeding" response has been provided for the courting male. It is of interest that some of the males which are courted also feed on the secretions which are exposed by the raised wings of the courting male. They thus provide the stimulus necessary for the latter to attempt the clasping response, which is morphologically impossible with other males. Thus, homosexuality here is not onesided; there *is* a courting response by one male and an answering feeding response by the other male, before an attempt at clasping between two males is made. The courting male is always acting like a male, except that he directs his courtship at another male. I sometimes refer to the male-to-male courtship response alone as homosexual behavior, but it can be seen that there is a difference between this and male-to-male clasping attempts, just as Dr. Lorenz mentioned. Further, there is no permanent emotional bond between male cockroaches, as does occur among other animals, so the term "homosexual behavior" may mean many different things among different animals.

*Lorenz:* There are quite a number of birds in which each male and female may show both sets of sexual activities; in pigeons, jackdaws, and ravens, any individual can perform as a male or as a female; which the individual does is exclusively determined by its rank-order relationship to its partner. The inferior animal behaves as a female; the rank-superior animal acts as a male, quite irrespective of its real sex. Arthur A. Allen (9) found that as early as 1914, in the ruffed grouse, and Craig (10) found exactly the same thing in pigeons. In the birds where this is not the case, this nonambivalence is very probably a secondary stage.

In gallinaceous birds, pheasants, the male plumage has more or less the same effect as a male display behavior which is permanently

shown. In these birds the males cannot perform as females but the females can perform as males, the moment they are not dominated. To a certain extent, this actually is still the case in greylags. We have never seen a male greylag perform as a female or do anything like Dr. Kramer's cockroaches, because neck-dipping is not a female activity; it is a nondimorphous activity.

My daughter-in-law, Beatrice Oehlert (11), made a discovery while working on her doctor's thesis with us. Her task was to clear up the absolutely unintelligible way in which heterosexual pair formation was secured in some cichlids. In other species of the same group, we know that the aggressive activity of the male is switched off and sexual activities are released by specific female releasers, by submissive gestures characteristic of the female ready to pair.

I did my best to bias Beatrice Oehlert's work by telling her to look for these signals but she didn't find any. However, in spite of my attempt to bias her, she found the right solution, which I think i'; highly interesting because it also applies to these sexually ambivalent birds.

She did indeed reach the solution, by a very thorough analysis of the behavior of the fish when they were activated by "mixed" motivations. To achieve this, one must be perfectly familiar with the intention movements of one's object. The slightest twitch characteristic of aggressive, or sexual, or escape mood must be recognized and interpreted correctly. In cichlid fishes this is comparatively easy in one respect, because these single elements are particularly clear-cut; it is particularly difficult in another, because when two fishes meet their motivations are always mixed, the three drives mentioned being always activated simultaneously. To correlate, for example, the movement of turning broadside-on to aggression or the movement of standing head downward and quivering to sexuality, it is necessary to check, innumerable times, whether the prediction is correct, that an individual, in whose behavior the first is predominating, will attack, and that one which preponderantly shows the second will soon proceed to other sexually motivated activities. It is very interesting to note that, in the process of learning to know one's animals, one actually *first* finds oneself able to predict what will happen, and only on profound self-examination does one become able to abstract the indicators observed which are forming the objective basis for one's prediction. All this can only be achieved by literally months of observation.

Beatrice Oehlert found an important and entirely unsuspected kind of sexual dimorphism: the single motor elements, pertaining

to the three motivations of aggression, sex, and escape, ever present in any meeting of two sexually mature fish, were absolutely the same in male and female. But the compatibility, if I may say so, the "mixability" of these elements was different in both sexes. In the male, she found every kind of mixture and/or superposition of motor patterns which are aggressively and sexually motivated. A male can threaten a female and even actually hurt her, and yet, simultaneously perform movements of an unequivocally sexual nature. On the other hand, he is quite incapable of even the slightest intention movements pertaining to sexual motivation as long as his partner inspires him with even a small amount of fear. Escape activities and sexual activities are entirely incompatible in the male, at least when both are elicited by the same object. In that case, escape and sexual behavior are mutually exclusive in a sort of flip-flop mechanism.

In the female, all this is reversed. The female can be quite seriously afraid of the male, and yet sexual behavior patterns are not blocked in her. She can actually perform sexually motivated movements while on the run before a male who is aggressively chasing her. All mixtures and superpositions of escape and sexual behavior are possible in the female. But she is completely unable to give the slightest sexual movement as long as she is aggressive toward her partner. While the male is sexually incapacitated if he be ever so slightly afraid of his partner, the female is sexually incapacitated if she is is not sufficiently afraid of her mate to inhibit her aggression against him.

Curiously enough, the strength of her present sexual motivation has no influence whatsoever on her aggressivity. If anything, she becomes more aggressive with increasing sexual motivation. She may be bursting with spawn and actually in danger of dying of spawn retention, and yet furiously attack and persecute a male who, though he may be sexually perfectly capable potentially, is unable to "command her respect" by sufficiently intimidating her. So it would seem that, in the female cichlid, aggression against the partner absolutely inhibits all sexual responses toward him.

It is certain that this sexual dimorphism which concerns only differences in the interaction between the ever-present motivations of aggression, escape, and sexuality, is yet in itself sufficient to ensure the formation of heterosexual pairs, in other words to prevent homosexual pair formation. And furthermore, the same mechanism is quite obviously at work in the pair formation of many other animals. Take, for instance, the many species of birds in which each individual, irrespective of its sex, potentially possesses all the

behavior patterns of both sexes, and in which the question whether the one or the other set of sexual activities will be elicited depends exclusively on the social relation between the two partners, as Allen (9) has demonstrated this in the ruffed grouse, later Craig (10) showed it in doves, and I in ravens and jackdaws. All this, of course, is brought about by the same mechanism Beatrice Oehlert found in cichlids. Fear inhibits male sexuality, but not female sexuality, so any of these ambivalent birds who is socially inferior to the partner reacts as a female, and vice versa.

Erich von Holst, on hearing all this, once contended that the same mechanism was at work even in human pair formation. He said something to this effect: "Try to imagine that you are Gulliver in the land of Lilliput, and you see a lovely little girl there who is 10 inches high. It is perfectly conceivable that you might fall desperately in love with her. Then imagine that you are coming to the land of Brobdingnag, and you see a girl who is six stories high. It is quite impossible to conceive of your falling in love with her."

That is quite important. I think that it was a good piece of work to find such a principle in a doctor's thesis. These unexpected results were brought about by adhering to a good method; by studying behavior of mixed motivation, Oehlert found some things can be mixed and some cannot.

*Lifton:* You described both sexual behavior and sexuality in behavior of groups. Is there any situation in which something else occurs, as we see sometimes in the human situation, where a group is built largely out of commonly shared hostility and there are no evident sexual bonds, or, if there are sexual bonds, these are repressed. It is the hostility in these cases which is responsible for the group's effectiveness, and where a sexual bond does occur, such as a male-female bond in the group, this can have a disrupting effect upon the group. Is there anything of an equivalent nature among your geese?

*Lorenz:* The common attack on a common enemy is at the root of all this group formation, from cichlids upward. The common attack upon the enemy is primarily what prevents the attack between the two individuals well known to each other, and this may occur in a very primitive state.

In the case of two animals who do fight to a certain extent in their cage but have become habituated to each other, their fighting has decreased in frequency and intensity by reason of the process of mere sensory adaptation to each other. This adaptation has, of course, no effect on their response to a third, new animal which

is put with them. They will at once attack it together, and, in the act of attacking, get rid of some of their mutual aggression, too. It works both ways: mutual adaptation increases the readiness to attack a third party, and the attack on the latter decreases the need to attack each other.

*Lifton:* Those are friends, you might say. Can a group of three or four geese form in which there is no sexual bond among them?

*Lorenz:* There is, as I have already explained, a slight element of sexuality in all triumph ceremonies. But it may be so low as to be practically unnoticeable. In the groups of nonbreeders which we so often get in geese, there certainly is a mutual triumph ceremony, but one never sees any sexually motivated movements at all. And quite small babies, whose sexuality is certainly negligible, do have a perfectly well developed triumph ceremony. And all these groups will launch a common attack on any nonmembers whenever occasion offers.

*Lifton:* Will that group remain exclusive and continue to keep out other geese?

*Lorenz:* Yes, certainly. All these groups are very conservative and very exclusive. A goose which has no "introduction" through somebody, as Dr. Mead said, by marriage or some mutual friend, may remain a social outcast for 7 years; that is as long as our colony has existed. Some geese brought in as adults from different sources remain complete social outcasts. On the other hand, even though there have been all kinds of introductions into a group, the queerest and most complicated structures can result; for example, two snow ganders, each of which had contracted other liaisons, fell in love with each other. One of them, Paul, had normally paired with a female greater snow named Madi. Later on, a sexually highly active female, who is one-quarter domestic, one-quarter greylag, and one-quarter greater snow, named Adele, seduced Paul into copulating with her regularly and gradually became his second wife. Hachy, the other, had had a beginning affair with a very young goose, Gretel, who still was very much attached to her brother Hansel. Hansel, long before sexual maturity, had courted a female three-quarter snow-greylag hybrid named Adelheid. Tenuous as such a chain of "introductions" may seem, it is quite sufficient to produce a mutual triumph ceremony of everybody concerned. It is worth mentioning that mere spatial keeping together of geese does not necessarily lead to the development of a triumph ceremony. A goose and a gander who were isolated together on migration in winter 1952-53 and who spent months together on a pond some hundred miles away, separated immediately on coming home to

Buldern on 8 April 1953. We said jokingly that they must have quarreled on the last day of their journey. When one throws two geese in a pen together forcefully this is still less inspiring to a triumph ceremony. But that group of greater snows has remained together for several years now and has been increased by the advent of two young ones, one hatched in 1956 and one in 1957. And the group can always be told from other snow geese by that one Canadian, Adelheid's foster sister, who is flying with it. *Fremont-Smith:* They never mate?

*Lorenz:* We don't know whether "normal" pairs will ever crystallize out of that group. They are all so intimate with each other that they copulate rather promiscuously at present; nobody can seriously attack anybody else by virtue of the mutual triumph ceremony. When Mädi had babies this year who certainly were Paul's children, it nevertheless was Hachy who took particular care of them. It is quite possible that he will mount guard at Mädi's nest this year and thus gradually slide into a "normal" marital relation with her, and Hansel seems to be developing a special liking for Adelheid. But to what extent pairs actually will sort out of that group and to what extent it will stay together permanently, that is just what we have to find out. There is a certain tendency of pairs to separate from the group at the period of house hunting, but estrangement takes a long time. In non-breeding season the former group may suddenly reunite in a mutual triumphing again. All this is very complicated and all possible graduations may occur. Of course, it is only a human prejudice, but one always finds oneself wishing that one-female-one-male pairs should develop.

In snow geese it might be found that a certain amount of group promiscuity is quite normal. Their breeding colony organization is different from that of the greylag. In the greater snow the nests are much closer together.

*Birdwhistell:* When a triumph ceremony is held, *is* it held in sets of twos?

*Lorenz:* No, the whole group forms a sort of phalanx with converging necks, the converging heads close together. If there is another group, you suddenly have the two closed phalanxes standing opposite each other, all with converging necks and threatening at the other group because then the re-direction instantly takes the direction at the enemy, and there are two big family palavers, one group converging here, the other standing here, casting black looks, A superior group, hearing this noise from far off, will rush up to drive the two groups apart.

*Goffman:* That is what we call a clique.

*Lorenz:* Yes. This snow goose family of eight stand together and they are dominant over all other groups. As long as they are there, no other triumph ceremony goes unchallenged.

*Goffman:* Dr. Frank, or any of the other group-psychotherapists, there is a convergence here with Bion. The same basic themes occur: flight, fight, and pairing. Did Bion come upon them independently?

*Frank:* I think independently. Do you know Bion (12) in England, Dr. Lorenz?

*Lorenz:* No. This is taken from Helga Fischer's work and is still unpublished.

*Frank:* He regarded pairing, fight, and flight and dependency as the "basic assumptions" of groups.

*Fremont-Smith:* Bowlby, of the Tavistock Clinic in London, has been closely exposed to it.

*Lorenz:* That is before Bowlby got interested, I think.

*Frank:* Bion published this in the late 1940's,

*Lorenz:* That is before Bowlby got interested.

*Goffman:* These seem to be important natural processes in many group situations. I think Bion's work here is of the best that has so far been done in the area.

*Frank:* This raises a question I don't know how to ask. I understood you to say, near the beginning, in some of the herds or flocks or schools of fish, in which there was no individualization, there were no groups, in some ways. I am mixed up here.

*Lorenz:* I said in the beginning that in species in which there is no fight, there is no individual recognition. You get only anonymous flocking. These anonymous flocks I don't regard as groups.

*Frank:* Don't they have group properties with respect to other flocks?

*Lorenz:* No, they merge. They don't even notice the arrival of a new, unknown member. A new member may be introduced by a member who falls in love with him or her and thus may be accepted into a triumph ceremony group within a week or so. Or, if he finds no contact, he may remain outside any triumph bond for 7 years.

*Frank:* Suppose a flock ran into another flock, do they merge, do they fight? I don't know what animals you referred to.

*Lorenz:* Starlings will merge and geese will fight. In all animals where there are personal bonds of this type, there is a rather high rate of exclusivity. The two flocks will fight as flocks. They do in rats; they do in dogs, Eskimo dogs, and monkeys.

*Hess:* There is an exception in the migration season.

*Lorenz:* Yes, but then there are anonymous flocks. Even in geese the flocks built out of many families are "anonymous" in respect to the families as such. Each family keeps together, its members still retaining its personal bonds, but any family as a whole will fly with any other family; yet a single bird will fly only with its own family, unless it has entirely lost it. But there are so many animals in which the flock is completely anonymous, as in starlings, and there are animals which form personal bonds in one season and anonymous flocks in another, as many birds do, and also cichlid fishes.

*Frank:* Are ordinary herd relationships based on two?

*Lorenz:* I don't know.

*Frank:* There are some that are not.

*Lorenz:* Altmann's (13) herd of deer certainly are aggressive and repel unknown members of another flock.

*Blauvelt:* There are overt interrelationships between the members of our goat herd. In many ways they often act together in a population behavior. There is fighting when an outsider enters the group.

*Lorenz:* On migration, goose flocks flock anonymously; at that period they will follow any other flock, whether they know it or not.

*Goffman:* That is a relationship.

*Lorenz:* That is a relationship, but the family group of geese, the triumph group, stays together; it doesn't dissolve in other groups. The only thing that is different at migration time from nonmigration time is that the flocks keep their distance but they follow each other to form large flocks (5, 14, 15). In other words, the goose families, as wholes, behave like single herrings. The herrings flock; each herring stays together, but the herrings flock together anonymously. On the other hand, in starlings, quite indubitably, husband and wife ties are lost, and the group just merges into the migratory flock.

*Mead:* In Antarctic penguins, the "husbands" and "wives" travel separately, in separate flocks, and then arrive.

*Lorenz:* What penguins do while on migration, while out on the sea, is not known, and I have a very strong suspicion they are quite anonymous out there.

*Mead:* It is known they arrive separately, so therefore they didn't travel as a family.

*Lorenz:* They didn't travel as a family, but geese do travel as families.

*Frank:* The flock has some group properties, at least you can

identify it as following a leader and going somewhere. Does it have any group properties at all as a group?

*Peck:* It maintains a perimeter in relation to other individuals.

*Lorenz:* It just stays together. A herring has a social attraction for another herring. Its effect is rather like that of cohesion, in the physicist's sense, just keeping the groups together, as a drop of oil keeps together when swimming on water.

*Birdwhistell:* We have models for humans in groups that have two kinds of social organization: where part of the year they live in family groups, and the next part of the year they are integrated into a village or tribal group. Rules of another order may be in effect when the whole group is assembled but you do not get anonymity. Anonymity in humans does not necessarily follow in a dual organization social arrangement.

*Lorenz:* There are group properties. For instance, you can find such an anonymous swarm has an attraction for unattached individuals, or little swarms, which is exactly in proportion to its size.

*Buhler:* One seems always to swim ahead or to fly ahead.

*Lorenz:* No. Such anonymous swarm is very queer in its behavior, because it behaves just like an amoeba. It swims around and around and cannot make up its mind to swim away unless —

*Walter:* Careful, the amoeba has a tail.

*Lorenz:* I concede that it is less organized than an amoeba; it may develop two pseudopods, one wanting to go one way and one the other.

*Walter:* The amoeba doesn't provide quite that illustration any more.

*Liddell:* It has a tail.

*Lorenz:* Yes, it has a tail. Such a swarm cannot get away for a long time if there is no mutual taxis orientating it. Sometimes, some individuals start to swim in one direction so that the swarm develops a pseudopod in that direction, but this protuberance gets thinner and thinner, and then the attraction of the swarm draws a pseudopod back. You can do a very nice experiment. You can remove the fore-brain of a fish and it will still eat, still be a quite normal fish, but it ceases to react to the swarm, it ceases to have schooling response. Then you get a leader.

There was a cartoon by Gardner Rea in The New Yorker where a swarm of fish was following one little leader, and one of the fish in the rear ranks said, "God knows what we'd do if anything should ever happen to him."[*] That is what von Holst[**] showed, the

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[*] Quoted by permission of *The New Yorker* (cartoon, issue of Jan. 19, 1957).
[**] Unpublished.

fore-brainless animal, by virtue of not being influenced by the herd, automatically becomes the leader and guides the swarm around.

*Bavelas:* If from a group you knew quite well you removed one member, could you say what results it would have in the structure?

*Lorenz:* We have removed Adele lately, Paul's second wife. This resulted in a slightly stronger attachment to his "main" wife, Mädi. Also, Adele was missed. The flock was alerted, for a certain time, to all flight-eliciting stimuli. It wasn't quite as confident and tame as it had been, for a week or so; then it gradually settled down.

If you would remove one of the chief ganders, Hachy or Paul, strongly attached to each other, the remaining one would search, In other words, this group would move restlessly about looking for the lost one. Also, the group would go down in pecking order, because Paul, without Hachy, would show a tremendous drop in aggressiveness. This applies to all loss of numbers in a group because, as these geese defend each other, the social rank of a group is determined by its number, among other things. So, the rank-order of families is, to a great extent, dependent on the number of sons going with the family at the present time, If the top Canadian happens to have his eggs eaten by some predator, and his next inferior happens to rear a brood of five, and these five be husky sons, it is inevitable that the rank-order of the two families will shift, and the family with the larger number of sons would beat up, on some occasion, the family which this year has no children, so that the two parents stand alone.

*Peck:* I think it might be important to make one observation, since these are meetings on group processes, and there are implied, if not explicit, definitions of groups expressed here. For some, it is a group only if it has this or that property, which seems important to them. Actually, no conglomeration of individuals has been mentioned yet that doesn't have at least one property which is not associated with some quality which for some one of us designates that conglomeration as a group. This can become pretty confusing. I suggest, therefore, that whatever defining concepts we use, for the sake of good communication between us, it is important to say, "This is a group for this and this purpose, or under these and these conditions."

*Fremont-Smith:* Group with respect to what?

*Peck:* Group with respect to what, yes.

*Lorenz:* I circumvented the need of defining group as such by talking of one kind of group exclusively, and that is the triumph ceremony group winch is defined by the geese doing a number

of well-defined things: by not fighting, by staying together, by defending each other if attacked by a member of an outside group, and by search for a lost member, and, of course, by performing a certain ceremony together. That is an objective definition of the triumph ceremony group. I think that all definitions of groups should have in them something similar. Of course, every anonymous group has one.

*Peck:* One of my delinquent children would say of a club that has been meeting for years in one of the centers, "That is no gang." What he is really saying is, "For my purposes, we don't have to consider that conglomeration of individuals as a group."

*Fremont-Smith:* Your group should be defined in positive and negative activities, the things it will do and the things it won't do. The things it will do in terms of aggression from outside, the searching it will do if one of its members is lost. There should be several dimensions defined.

*Lorenz:* This group is defined by the nature of what keeps the group together.

*Goffman:* But surely there are classes or sets of individuals which most sociologists would not call groups. There is, for example, Radcliffe-Brown's famous example of red-headed women named Mary living in Chicago. These females are not a group in the sociological sense.

*Mead:* Unless they form a club.

*Goffman:* We can't agree today on what we should include. Let's not get carried away.

*Peck:* I would like to accept the challenge, in this sense: I am not prepared to say that red-headed Chicago women *per se* form a group by any definition I can conceive of, but I do think that this tendency to sneak in our bias about what a group is for us (or what a game is) can lead us to fail to collect some kinds of data which might permit us to see a collection of individuals as a group had we collected those data.

*Goffman:* No one would disagree with that.

*Walter:* One might specify these properties in quite mechanistic terms. Obviously, a group of individuals or a clump of individuals may have a common goal and have no feeling for one another. You see this when fish are feeding. If you dive under water and watch fish being fished for, they will agglomerate around the hooks, waiting for the bait. They have no mutual attraction, but slight repulsion. They are like a gas, with individual molecules neither strongly attracted nor repelled. But if to that situation some degree of mutual attraction is added, then a new sort of aggregation

results. This is true aggregation; they form a flock or school. I would call this an aggregate as opposed to a conglomerate, in which there is only a common goal, with no mutual attraction.

*Goffman:* Internal ordering.

*Walter:* Based on the mechanism of this mutual attraction. If individuation is added, so that at least some individuals are mutually recognizable, the complex networks, which do not exist in the conglomerate or the aggregate, begin and various degrees of association can be specified in the minimum requirement for the formation of these.

*Fremont-Smith:* There are seasonal changes and hormonal changes; there are all kinds of complexes.

*Walter:* For example, under the action of crowding. It is easy to show with working models the formation of a conglomeration and an aggregation by the action of a common goal and the appearance of mutual attraction and repulsion. If you enclose a few of my animal models in a palisade or corral and move the obstacles in progressively so as to crowd them together, at a certain point they may suddenly condense together like a gas being compressed into a liquid, and be attracted to one another; they begin to act as if they would be attached to one another. But if you compress the system still further, they will suddenly begin to explode, as it were, because they are touching one another too often. So you get three phases, formation of loose conglomerates, aggregation, and explosion.

If you now change the basic conditions, for example of illumination, you may then get a condition in which the mutual-attraction group or aggregate will form itself without the palisade, as though there were a hormonal or seasonal change. This may appear almost magically following a very slight change. This is a terribly important feature of such a situation because these are amplifying networks, so that even very slight effects can be cumulatively magnified like a snowball and have a dramatic effect on the behavior of the individual and the society. Scarcely perceptible influences will change the conglomerate into an aggregate.

*Birdwhistell:* Are you suggesting individualization is a function of group behavior?

*Walter:* I think that would be a reasonable general hypothesis, but it might not be so in some circumstances. Perhaps the possession of a neopallium in animals above your birds might in fact produce amplification of personality without socialization.

*Fremont-Smith:* Dr. Lorenz, this is a little off the main theme,

but do young geese do anything that we would recognize as play, such as you see in young mammals?

*Lorenz:* Nothing whatsoever.

*Fremont-Smith:* You showed some kinds of swimming and jumping.

*Lorenz:* That is not specific of young geese, and I would be very careful not to call that play.

*Walter:* Is there no playing below mammals?

*Lorenz:* I really don't know.

*Fremont-Smith:* Does anyone know any examples of play below the mammals, reptilian play?

*Bateson:* There is a description in *King Solomons Ring* (16) of the jackdaws playing with the wind, not with each other.

*Lorenz:* Playing with the wind, yes; that is a question of definition.

*Walter:* Weren't they playing with insects in the wind? You see, a bird or something will never turn in flight unless it has to. If a bird is flying straight, he is going somewhere. When he is circling it looks very much as though he is playing and enjoying it, but if you watch him carefully you will find he is chasing insects which he needs to eat. He is working hard.

*Freeman:* We saw some swallows at play, which was very interesting. Several of them would dive down to the ground and pick up goose feathers. They would swoop down and pick them up in their bills and go high in the air, drop them, allow them to float down a considerable distance, and then would dive down and catch them in their bills.

*Mrs. Freeman*[*]*:* Not in the nesting season; in other words, it had no relationship to anything they needed to do. It wasn't like the insects and it wasn't the nesting season.

*Lorenz:* It may have been low-intensity nest-building activity. It is useless to attempt a short implicit definition of play. If you ask me to talk about play, I either have to write a volume or simply say I don't know about play.

*Torre:* What about dolphins and porpoises?

*Fremont-Smith:* Those are mammals.

*Goffman:* Let us keep in mind that this is playfulness, perhaps, not game.

*Lorenz:* Play would be a subject for a whole Macy Conference, much more than 3 days.

*Fremont-Smith:* It would be a subject for 5 years.

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[*] Editor's Note: Mrs. Frank S. Freeman attended the final session of this Conference as an unofficial guest.

*Lorenz:* I would say, quite pragmatically, you see performances in ravens and parrots which are comparable to what we call play in mammals. A raven will lie on its back and another raven will sit on it and "pretend" to be killing it, while all social inhibitions persist, neither bird really pecking at the other.

*Fremont-Smith:* Is this among young ones?

*Lorenz:* Mostly young ones.

*Fremont-Smith:* I think it is rather interesting. In mammals, play is so highly characterized, overdeveloped or most developed in the young, that the finding of this in young ravens would make me feel it belongs in the category.

*Lorenz:* It makes me feel it belongs in the category. This explosion activity of flying and diving, which is seen in bathing geese, is all so mechanical and is not distinguished from the "serious" application of the same motor pattern as real play is. In short, I should be loath to call that play, though it looks exuberant.

*Mead:* Is there no behavior among the immature young, who are too young to mate and therefore not a really serious threat to the fathers of families, when they are roving around the daughters, which might be regarded as play, in that it is testing out lighter aggression, or anything of that sort?

*Lorenz:* There is no testing out. As far as geese are concerned, there is no element of explorative behavior in all these low-intensity activities, with which courtship or any other activity begins. If I were to define play of mammals, I should say there is an element of latent learning, of exploratory behavior in it, and that just isn't the case in geese. Everything they do for the first time is done in exactly the same manner, photographically, as the adult goose would do it.

*Walter:* Would you say that in the network societies there is anything like learning in the individuals? Do they learn that a certain relationship is satisfactory and try to re-create it if it is destroyed, or elaborate it?

*Lorenz:* There is a lot of learning, of course, learning to know.

I will tell you about one thing which certainly is learned in these cases. A goose which has social success, which has beaten up its next superior, has learned that it is possible to beat up superiors. On our records there is hardly one case in which a change of rank-order between two geese or two families took place and either the one going down or the one going up made only one step. The one going down, in its depression, is instantly caught by the next lower one and again subdued. You know, it is something like delayed boiling in water. A young chap may be much lower

down than his strength and his aggressivity merit just by virtue of being habituated to the superior. Until one day this becomes super-liminal and suddenly a young pair go rocketing up through society, going one, two or three steps up, and possibly dethroning somebody like the Hachy-Paul group.

*Blauvelt:* Are there patterns of behavior in birds in which an action, usually indicating weakness, becomes a strength? Goats have one. The mother, protecting the territory in which her newborn lives, has available a fighting pattern which wins. We have not seen this in other phases of the life cycle It is characterized by relentless persistence. To understand how this pattern functions it is desirable to know something of the fighting behavior of goats.

When goats fight goats, they lunge and butt. Simply lowering, then lifting the head against the adversary is a threat, lacking the force of the fighting butt. If the attack is from a distance, a fast running lunge, head down, precedes the butt. The head then lifts in the "toss" of the horned animal. Or the horns may be held against the adversary, pushing it back. The animal moves away from its opponent and positions for the next butt before it attacks again.

In an attack at closer quarters, the goat often gains distance by rearing up on its hindlegs. As it rears, the animal may swing its body to one side away from its opponent. The weight of the falling body adds to the force of the butt. The torque position of the body at the height of the rear orients the animal for a wider choice of body areas which it may assault.

In very close infighting, a goat butted on the side of the neck or head may roll with "the punch," pulling slightly ahead of the attacker. Then a quick lowering of the head, sometimes the whole forequarters of the animal, permits it to swing its head under that of its enemy, up on the other side, and gives space for a quick butt against the side of the opponent's neck. The momentum of the original attack assists this maneuver.

In each of these fighting sequences, and the combinations and variations of them we have observed, the attacker must pull its head away from its opponent before the butt. In the "appeasement or persuasion" behavior which may stop a fight, one goat keeps its head against that of the other, not permitting it to pull away. The head may be held alongside that of the enemy. This orientation exposes the vulnerable neck region to the adversary but, as long as contact is maintained, makes it impossible for him to use this advantage. Sometimes that "appeasing" animal licks the face of the adversary. This behavior can be maintained until the appeased animal changes its behavior. This may permit the appeaser to retire

without a fight, or, as in courting bouts, may initiate some non-aggressive relationship.

When the mother of a newborn is attacked and is unable to threaten an adversary from the territory around her young, she fights. When the adversary is too strong to vanquish, she holds her head against that of the attacker, preventing further attack. As her enemy backs away for butting room, the mother goat follows, her head following every move of her adversary's head, but she does not stop the fight. As she follows, she finds opportunity to swing away for a quick butt without permitting her enemy to do so. This fight may continue a long time, the two animals moving together through the herd, leaving the newborn. Do you know of similar behavior in other animals?

*Lorenz:* Nothing of this sort. In cichlids, I can show a number of particularly vicious types of fight in parents which have newly hatched young, or young eggs, which has the consequence of their always being victors. The same is true of a gander with tiny young. I have already said that. But I don't think we have any comparable, particularly quantitatively different kind of behavior which makes for victory in a certain place. It is only a quantitative change. Dr. Blauvelt's example is one of a most interesting quantitative change, concerning only one individual and causing its superiority.

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