



Scott, J.P. Hostility and Aggression in Animals.
E.L. Bliss (ed.) Roots of Behavior,
Hafner Publ. Co. New York 1968. p. 167

Q43

By human standards, hostility and aggression are bad things. They are also bad, or at least poor, as scientific concepts, because they are almost impossible to define in any objective way. In this paper I am therefore going to talk primarily about agonistic behavior, using hostility and aggression only as terms which help connect animal phenomena with the problems of human behavior.

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In Collias'¹ classic review, Aggressive Behavior Among Vertebrate Animals, he came to three principal conclusions: First, a great deal of fighting in vertebrates is connected with the phenomenon of territoriality. Second, fighting in animal groups tends to become organized into social-dominance hierarchies which have the net effect of greatly reducing the amount of fighting. Finally, one of the major physiological factors connected with fighting in vertebrates is the male sex hormone.

1. Collias, N. 1944. Aggressive Behavior Among Vertebrate Animals, Physiol. Zool. 17: 83-123.

C. Lorenz

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Experiments with heredity and agonistic behavior show that important individual differences do exist within the same species, both in the case with which fighting can be stimulated and in the capacity to fight or escape successfully. Besides this, there are important sex differences in vertebrates, the males with few exceptions being more aggressive and better adapted for fighting than the females. In mammals there is more to this difference than the presence and absence of the male sex hormone. The available data indicate that the female nervous system is unresponsive to the male hormone in respect to modifying fighting behavior.



A - Learning

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In the first place, fighting is strongly affected by learning. Success in fighting is a powerful reinforcing agent, so that successful experienced animals are much more highly motivated to fight than inexperienced ones. Animals also form strong habits of not fighting, either as a result of lack of success and the resulting punishment, or, more importantly, by simply not fighting. This last mechanism is one of our most effective and satisfactory methods of social control of fighting.

dominance O

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Finally, there are three major ways in which social fighting is controlled among animal societies. One of these is the organization of social-dominance hierarchies mentioned above. The agonistic behavior between two individuals becomes organized by learning and habit formation into a regular relationship of threat and avoidance. Many variations of the dominance relationship exist; but in its most typical form the dominant animal threatens, and the subordinate animal submits or avoids.

A. Learning

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A great deal of human fighting and aggressive behavior is maladaptive, and much of it can be explained as the result of frustration. However, the animal experiments indicate that the maximum amount of fighting is produced not by frustration but by success in fighting. Furthermore, habit formation controls aggression even where frustration exists, and the frustrated animal only attacks those individuals which he is in the habit of attacking.



A-ans Sum.

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The comparative physiology of fighting behavior in animals yields the extremely important conclusion that the primary stimulation for fighting behavior is external; that is, there is no spontaneous internal stimulation which makes it necessary for an individual to fight irrespective of the outside environment. The physiological and emotional factors involved in the agonistic behavioral system are thus quite different from those involved in sexual and ingestive behavior. This leads to the hopeful conclusion that effective control of agonistic behavior is theoretically possible. In any practical situation this may be quite difficult because a vertebrate animal has a behavioral system organized to produce fighting behavior in response to certain kinds of external stimulation, and the complete elimination of such stimulation may be impossible.

✓ *ca: longer learning. 105*

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Calhoun¹ established an experimental colony of wild Norway rats and studied their behavior for two years. There was always an abundant supply of food on hand, but this was always placed in one spot in the center of the area. The only essential difference from wild conditions was that the movements of the rats were limited by a fence rather than by physical or social barriers. Under these restricted conditions, numbers in the colony never rose above 200. However, this control in population was not achieved by bloody fighting. The rats close to the food supply established themselves in holes and were avoided by rats from outlying points. This meant that the outlying rats never got as much food as those in the more favored positions and were consequently in poorer physical condition. Their reproductive rate was low.

The dominance relationships of the rats were



produced not by violent fighting but by a process which Calhoun called "psychological drubbing." When a young rat wandered into the area occupied by an adult, the latter would seize it, shake it, and chase it away without biting it or doing any actual harm. Thus the young rats learned to avoid the established adults.

At the same time the rat colony showed a form of unconscious cooperation. Rats near the food pile would carry it away and store it in various outlying areas. These food supplies were not guarded, and the outlying rats would come and take them away without having to run the gantlet into the central supply. This trait of food scattering in wild rats thus has value for the survival of the social group.

1. Calhoun, J.B. 1950. The study of wild animals under controlled conditions. Ann. New York Acad. Sc. 51, 1113-1122



dominance P

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A second method of social control arises in connection with the process of primary socialization. In many species the young do not fight in early life and tend to form a habit of peaceful behavior which remains in adult existence, or fighting may first arise in a playful form and a dominance relationship be formed without serious fighting taking place. Older animals may establish dominance over younger ones simply by threats or carrying them around.

territ. M

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A third method related to the other two is a system of territoriality, which keeps strange animals apart and usually limits fighting to threats between neighboring animals at the boundaries.

compare text - dominance

Summary animal societies.

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These general methods are highly effective in controlling destructive fighting in well-organized animal societies. This means that under natural conditions hostility and aggression, in the sense of destructive and maladaptive agonistic behavior, are hard to find in animal societies.



3 dd. rodents ;

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Apparently these rodents fight only when two conditions are present. One is a disorganized population when strangers are forcibly brought together. Even so, the mice do not fight unless a second condition is present: that no escape is possible. Agonistic behavior is so organized in these animals that fighting is not the first, but the last, resort.

3 d. deer

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In species like the red deer of Scotland¹ or the mountain sheep of North America,² agonistic behavior is highly regulated by heredity and physiology. During most of the year there is almost no fighting or conflict. Serious fighting between the males appears in the rutting season in the autumn. The red deer, which are quite similar in their behavior to the elk or wapiti in North America, indulge in pushing contests whenever they come together, and each male attempts to round up a herd of females, mating with each as they become receptive. All this activity is highly exhausting, and a male is able to maintain his dominance for only a few days or weeks after which he becomes tired out and gives way to a challenging male. The beaten animal, however, is rarely injured in any serious way, although occasionally deaths from starvation occur if two males happen to lock their



antlers. 1

1. Darling, F.F. 1937. A Herd of Red Deer. London, Oxford University Press.
2. Scott, J.P. 1945. Social Behavior, organization, and leadership in a small flock of domestic sheep. Comp. Psychol. Monographs. 18(4): 1-29.

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The most interesting fact about the fighting of these ruminants is that fighting always occurs in pairs. It is always a fair fight between two individuals, and deer or sheep never gang up on one another. This appears to be a hereditary characteristic for the control and regulation of fighting. The same animals are highly allelomimetic in their escape from predators.

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Since 1945 we have maintained a large colony of dogs at the Roscoe B. Jackson Memorial Laboratory. One of the standard procedures is to raise a litter of pups and keep them together until they become adults. Playful fighting appears quite early in development, and on this basis the litter forms a dominance order in which all fighting is reduced to occasional threats and growls. For example, one litter of Shetland sheep dogs was kept in a pen some 20 x 40 feet in size. The most dominant animals could range throughout the pen, while the subordinate ones were confined to the vicinity of the house and food supply. Whenever an observer came near, the attention of the dominant animals was distracted, and the subordinate ones left their accustomed places to come and see what was going on. The dominant animals then threatened the subordinate ones and chased them back to their places



without, however, ever inflicting any actual wounds. This is a typical case; serious fighting almost never breaks out except when strange animals are placed together.

1. Pawlowski, A.A., and Scott, J.P. 1956. Hereditary differences in the development of dominance in litters of puppies. J. Comp. & Physiol. Psychol. 49: 353-358.

(Scott) 2
Scott, J.P. Hostility and Aggression in Animals.
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Litters in breeds of cocker spaniels and beagles rarely show any sign of serious agonistic behavior. On the other hand, the fox terrier breed shows undue aggressiveness at a very young age. Puppies of any breed begin to show a tendency to gang up on each other about 7 weeks of age, but in most this is momentary and playful. In the fox terriers this type of fighting is serious and persistent and may result in death if the animal attacked is not removed. We found that we were never able to raise animals in litters larger than three, as one fox terrier can withstand the attack of two, but not three, opponents. This means that the terrier breed has been selected for unusual aggressiveness and, in fact, appears to be more aggressive than wolves. This applies even where they are raised in larger spaces. This hereditary trait limits their capacity for living in groups.

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Carpenter^{1 2} has studied two species of primates which also seem to show different hereditary capacities for expressing aggression. The howling monkeys form groups of adult males and females which stay constantly together. When these groups come into contact they make vocal signals and continue to stay apart. There is no fighting between males, and receptive females move freely from one male to another.

At another extreme are the gibbons, which are so aggressive that males always attack other adult males, and females attack other females. The result is that the largest social group of gibbons is a male and female pair with their immature offspring. Clashes occur as the pairs come into contact at the edges of their usual territories.



1. Carpenter, C.R. 1934. A field Study of the behavior and social relations of howling monkeys. Comp. Psychol. Monogr. 10 (2): 1-168
2. Carpenter, C.R. 1940. A field study of the behavior and social relations of the gibbon (Hyllobates lar) Comp. Psychol. Monographs. 16(5):1-212.

Indian Zoo 66.

- ✓ Scott, J.P. Hostility and Aggression in Animals.
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Until recently our picture of baboon behavior was based on Zuckerman's¹ study of Monkey Island in the London Zoo. This was a large colony of strange wild baboons confined in an area 100 feet long and 60 feet wide, large by zoo standards but extremely small in comparison to the natural range. The baboons began to fight and continued to do so over a period of three years. Sometimes the males literally pulled the smaller females to pieces. We now realize that this was a disorganized population composed of strange adults forced into close proximity in a very unequal sex ratio. Matters were not helped by the later introduction of other strangers.

1. Zuckerman, S. 1932. The Social Life of Monkeys and Apes. New York, Harcourt, Brace.

E. Aethiops - dominance.

- / Scott, J.P. Hostility and Aggression in Animals.
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Washburn's¹ recent studies of baboon societies under natural conditions in South Africa present an entirely different picture. Adult males have a strong dominance organization, maintain their distance from each other, and almost never come into conflict. An immature male may come close to an adult and be chased and chastised, but never physically injured. Washburn described a case in which an old male pursued a young one out to the tip of a branch in a tree, shook it vigorously until the young male almost lost his hold, and then stopped. This looks as if the adults become dominant over the immature animals without inflicting physical injury. At the same time the adult males will attack any predator as a group and are almost never bothered by them. In fact, almost the only opportunity for a predator to approach is at night when the colony is sleeping.



1. Washburn, S.L. 1958. Naturalistic observations of wild primates. Paper delivered at Am. Anthropol. A. Ann. Meeting.

Scott, J.P. Hostility and Aggression in Animals. E.L. Bliss (ed.) Roots of Behavior, Hafner Publ. Co. New York, 1968. p.173b

There is no more evidence of "fang and claw" behavior in the ordinary human society than in a well-organized animal society.

We tend to evaluate human behavior against an absolute standard of perfection required by our own moral codes rather than against animal societies, or even against the statistical evidence of what has been achieved by a human society under optimum conditions. Judging by biological standards, human beings have much the same capacities for social control of aggression as other primates.

At the same time, there is no reason for being complacent and satisfied about our behavior. Our biological heritage also includes capacities for developing harmful and destructive behavior under conditions of social disorganization.¹ The social control of behavior must be developed anew in each

generation; it cannot be created for all time. We have every indication that social disorganization does exist in our own as well as many other human societies, and the psychiatrists and clinical psychologists among the audience may well be asking, "What about the concealed hostility and aggression which we see every day in our patients." The vast need for psychological and psychiatric services is evidence that our society is far from perfect.

1. Leighton, A.H. 1955. Psychiatric disorder and social environment. Psychiatry. 18: 367-
2. Faris, R.E.L. 1955. Social Disorganization, 2nd ed. New York, Ronald.



highmann

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All of our present data indicate that fighting behavior among the higher mammals, including man, originates in external stimulation and that there is no evidence of spontaneous internal stimulation. Emotional and physiological processes prolong and magnify the effects of stimulation, but do not originate it. This means that in any practical instance the first place to look for causes is in the individual's social environment - as, for example, in the case of a schoolboy who continually attacks his fellow pupils and rebels against the teachers. There may be internal causes that aggravate his behavior, resulting from previous experience or inherited temperament, but there is always some real external stimulation. Someone (and more often several people) may be teasing, abusing, or physically attacking the boy.

Investigation usually reveals some kind of family disturbance. There may be a background of divorce, illegitimacy, neglect, desertion, adultery, or any of the other ills which indicate a disorganized family.

1. Glueck, S., and Glueck, E. 1950. Unraveling Juvenile Delinquency. Cambridge, Mass., Harvard University Press, for Commonwealth Fund.

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E.L. Bliss (ed.) Roots of Behavior,
Hafner Publ. Co. New York, 1968. p.174.

More than this, there appear to be certain focal areas where many individuals are involved in violence. In American cities, these are frequently sections in which there are large proportions of recent immigrants. Many of these are men without families. In the past we have sometimes blamed this or that nationality for the results. I would like to suggest that the disorder has a more general cause.

In any animal population, throwing a large number of strange individuals together and confining them in a small area creates a condition of maximum social disorganization, in which fighting escapes from social control. The severity of fighting is increased by a high proportion of males. There is every reason to expect that crowding a large number of strange people together in a tenement will also result in social disorganization, and that the disorder



will be more serious if complicated by differences in culture and language. This supports Faris' conclusion that crimes of violence are largely the result of social disorganization.

The remedy is, of course, to help immigrants to organize themselves as rapidly as possible. After all, we had the same problem on the American frontier – an initial period of crime and lawlessness which ended when the new settlers organized themselves to maintain order.

1. McNeil, E.B. 1959. Psychology and aggression. J. Conflict Resolution, 3: 195-293.
2. Faris, R.E.L. 1955. Social Disorganization, 2nd ed. New York, Ronald.

Scott, J.P. Hostility and Aggression in Animals. E.L. Bliss (ed.) Roots of Behavior, Hafner Publ. Co. New York, 1968. p.175a.

To take an example, one would never have predicted from the behavior of individual Norwegians in 1938 that they would shortly begin to fight. Yet they were soon involved in a war, being attacked by another human society. While warfare involves all the individual human activities included under the definition of agonistic behavior, it is agonistic behavior organized on a different level – that of societies rather than of individuals or of small groups – and as such has peculiar properties of its own. One of these is the almost axiomatic fact that in any conflict, other things being equal, the society which is most highly organized for fighting is likely to be the winner. This means that social organization itself is one of the major causes of war. A society which professes war as a cultural ideal and has a superior military organization is (judging from history) highly likely



to attack its neighbors. However, while such societies are well organized within themselves, they are disorganized with respect to each other.

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It is fascinating to pursue this idea of social disorganization as a cause for human conflict. In every human society the change from agricultural and feudal organization to industrial and economic organization has been accompanied by a great deal of individual and group violence, sometimes erupting into civil war. The transition from one type of organization to another automatically produces social disorganization and violence. However, it is hopeful that the newer type of organization appears to be a better method of social control than the old. No real statistical comparisons are possible, but we have every reason to believe that modern society controls aggression much more effectively than did the corresponding societies of the Middle Ages.



Summary.

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1. Many animal species have the capacity for agonistic behavior and hence for destructive fighting.
2. Animal societies have evolved several/basic methods for the social control of aggressive and hostile behavior, including territoriality, the dominance order, and the process of socialization.
3. Essentially the same methods (often not recognized or called by different names) are effectively used for the control of aggression in human societies.
4. Well-organized animal societies exhibit little overt fighting; one of the basic causes of destructive fighting is social disorganization.
5. At the same time, successful fighting is based on good organization, even at the individual level. The animal which has its behavior well organized for fighting by training and experience is likely to be successful, and social organization itself is one of the major causes of fighting.
6. The conclusions from animal observations and experiments have their most direct application to human behavior at the level of individuals or small groups.
7. One of the major causes of aggression in human societies appears to be family disorganization.
8. In our society, individual development goes through a phase of social disorganization in the adolescent and young-adult period.
9. Cultural disorganization results from movements of large numbers of strange individuals into a new area, as in the case of immigration into large cities.
10. The problem of warfare involves organization at another level, that between societies. Disorganization between societies is one of the major causes of war and may itself result from good organization at a lower level - the society well organized for war.



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On the other hand, some of the breeds have been selected in the opposite direction for an unusual capacity for group living. Among beagles, which are used for hunting in packs, it is often possible to place strange adult males together without any actual fighting breaking out. If fighting does occur, it can easily be suppressed by human intervention. Among these breeds, fighting is not likely to occur even under conditions of social disorganization.

* nat. cond.

Scott, J.P. Hostility and Aggression in Animals.
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On the basis of the above data it is apparent that each species has certain genetically determined behavior traits which under normal and natural conditions allow the development of social organization which exerts effective control over harmful fighting. Serious fighting between members of a natural social group is the exception rather than the rule. Far from showing violent competition between individuals, animal societies are generally highly cooperative and mutually protective. We can also draw the conclusion that one of the major causes of destructive fighting in animal societies is social disorganization.



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Wolves have had a popular reputation for ferocity over a period of centuries. These observations were largely made by farmers who only saw wolves as they attacked livestock and had no opportunity to see wolves at home. Murie, who made an intensive study of a wolf pack under natural conditions in Alaska, says:

"The strongest impression remaining with me after watching the wolves on numerous occasions was their friendliness. The adults were friendly toward each other and were amiable toward the pups, at least as late as October. This innate good feeling has been strongly marked in the three captive wolves which I have known. Undoubtedly, however, wolves sometimes have their quarrels."

The wolves hunted together and brought back food which they cached near the den or fed to the young

pups. The only fighting observed by Murie occurred when a strange wolf approached the den. It was attacked by the entire group and driven off in spite of adopting a submissive posture.

1. Murie, A. 1944. The Wolves of Mt. McKinley. Washington, D.C. U.S. Government Printing Office. pp.30-31.

cooperation carnivores

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E.L. Bliss (ed.) Roots of Behavior,
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Unlike the ungulates described above, these carnivores exhibit the capacity for combined group attacks, and aggression is limited in different ways. At the same time, they also have the capacity for developing remarkably peaceable and cooperative social groups. Our evidence indicates that social disorganization is a primary cause of fighting. Confinement may aggravate the effects but is not itself a primary cause. Heredity can either increase or decrease the capacity to respond to social disorganization.