

BEHAVIOUR RESEARCH ON FREE RANGING PRIMATES¹⁾.

DR. C. R. CARPENTER.

Possibly the question in the minds of most of the members of the Society is, what is the reason for the Asiatic Primate Expedition? Some explanations have been given by my colleagues but an attempt will be made here to state some of the more definite basic reasons for the expedition and to outline more specifically some of its objectives.

There is urgent need for behaviour research in social science. One finds everywhere in the West a very rapid development in the physical sciences, this branch having progressed tremendously. In fact, in the Western world the machine has almost got beyond the control of man; they have more instruments than they can control in reference to certain important social values. On the other hand the lack of basic information in the social sciences makes a striking contrast. The processes of social co-ordination and social control are poorly understood. One of the reasons for this situation is that social scientists have made a frontal attack on the problems of human society with its great and puzzling complexities. There inevitably arise errors of subjective judgments influenced by prejudices.

Assuming the relationships which are generally accepted in the biological field between sub-human primates and man, one may find, with considerable validity, certain social phenomena on the level with these highly developed animals; and these may be studied in a way similar to what has been done by comparative anatomists. On the level of sub-human primates one might find certain social phenomena standing in much bolder relief, and therefore most susceptible for scientific study. This indicates a general orientation of the type of work which the Behaviour Research Division is trying to accomplish. In other words it is seeking to discover some of the basic bio-social factors which in all probability underlie the cultural phenomena.

1) Summary of an address given by Dr. Carpenter, a member of the Asiatic Primate Expedition, before the Natural History Section of the Siam Society, June 29, 1937.

Another reason for the Expedition is that primates as research material for biologists are very important and it is hoped that observations of behaviour will assist in the problem of caring for the large colonies of primates that are nowadays kept in captivity for medical and biological research. At the present time in the United States there are a number of centres of research given over almost completely to the study of sub-human primates, monkeys and apes. The reason for this emphasis on primate research is quite clear. For example, in certain neurological problems the extirpation of various areas of the brain produces in the sub-human primates almost the identical results as the same operation in human beings. It is therefore possible to use primates for operation procedures and then to infer with considerable validity what results would occur in man. The same procedure is employed for certain work on hormones, blood chemistry and diet. Likewise on the behaviour and social level, primates are being employed extensively because of their marked similarity to human beings. This increasing importance of primates as laboratory material makes it necessary to have more knowledge about the natural habits of the animals. It is necessary to know the types of food on which they thrive, something about their habitat, preferences in relation to territorial range and other points. A lack of this information has led in many instances to unsuccessful attempts to keep primates either in zoological gardens or in scientific laboratories. Since 1925 Dr. Robert M. Yerkes of Yale has been operating very successfully a chimpanzee colony in Florida and using the animals for behaviour study in Yale laboratories but it is assumed that it is more or less impossible satisfactorily to keep gibbons under artificial conditions. That assumption, the speaker believes, is simply based upon ignorance and as soon as it is known how to care for these complicated and highly developed animals it will be possible to keep them successfully in captivity for research purposes.

It is possible that the gibbon may prove to be one of the most important anthropoids though it is sometimes classified as the lowest of the four anthropoid types. These types are: one, gibbon; two, orang-utangs; three, chimpanzee; four, gorilla. Gibbons are found in

the Straits Settlements, Burma, India, China, Siam, Borneo, Java and Sumatra. Orang-utangs are found in the regions of Borneo, Java and Sumatra. These two are spoken of as the Asiatic anthropoids. The chimpanzees and gorillas have Africa as their indigenous home. The lack of information about gibbons is very conspicuous, most of what passes for knowledge about their natural habits being anecdotal.

Briefly to summarize certain of their findings in relation to the natural behaviour of gibbons in North Siam, the first problem attacked was that of the ecological relation of these animals, that is the type of forest in which they live, the question of their territorial range, the question of food, and the question of the behaviour of primates in relation to climatic conditions. They secured fairly accurate data on those various problems. They have evidence that gibbons restrict themselves rather definitely to evergreen forests, and that they have definite ideas as to territory. This problem of territoriality is very closely related to that dominant ambition of man — the possession of property. For example, they have records of the behaviour of gibbons in regard to territorial range and the reactions of a group to other groups which attempted to encroach upon a particular territory. The extent of the claimed territory depends upon the number of animals in the group, on the amount and the distribution of the food supply, and on the pressure of other groups.

About the food problem of the gibbon the expedition learned that gibbons are, in the main, fruit-eaters, but they also consume small quantities of leaves, buds, flowers and insects. They had been noticed going to the nests of birds and robbing them of their eggs and a young bird had been found in stomach contents. Samples were taken from a large number of stomach contents; these will be analyzed and from the results they will be able to work out the naturally preferred diet of gibbons and thus be enabled properly to feed those kept in laboratories.

The result of the study of the Behaviour Research Division may be divided into two main categories, the first describing the individual behaviour, the second the social behaviour. From the point of view of individual behaviour it has been highly desirable to correlate certain types of behaviour with anatomy and physiology. The problem of prehension or grasping can be very interestingly studied by carefully compiling behaviour records of the gibbons and then studying the anatomy that makes this behaviour possible. It has been assumed by anatomists that the beginning of the upright posture in man could be traced to the upright posture of the gibbon and the orang-utang. Instead of man raising himself from the ground he had possibly swung to the ground from the trees and thus attained his upright bearing. The main instrument of recording individual (as well as social) behaviour was the moving picture and five thousand feet of pictures of these animals in their natural setting were made. These pictures will supplement the written descriptions of individual behaviour and will prove of immense value for the purpose of laboratory studies.

From the personal point of view the study of social behaviour was of very great interest. In previous personal work in Central America the typical forming of groups of other types of primates had been learned. The type of grouping for the gibbon was unknown and that was one of the first problems to face here. It was interesting and surprising to find that gibbons in Siam live in family groups with variations and with a high degree of monogamy. In a typical group was a male and female with young, the oldest of which was almost reaching adult-hood. Those main groups are to a large extent restricted to six animals or less. However in one or two groups studied there were more than one male, and in most of these groups they had no more than one adult female. In a few other groups they had two females, one of which was reaching the stage at which reproduction begins. Obviously this limitation of group sizes is in all gibbon life. The study of how the gibbons split themselves into groups was highly interesting. One learns a great deal of the varying degrees of attachment that exist in the group.

In animal sociology as well as in human society there are many important problems relating to communication, co-ordination and social control of groups. Therefore they had been concerned with the analysis of vocalization and gesture which might be said to be analogous to human language. Many phonograph records of the calls of the animals were made and from these they had been able to analyze five main types of vocalization. There were a series of calls which could be classified into sentences and phrases; these sentences and phrases were frequently woven together into mixed types. Vocalization ran into a series of utterances extending from a few seconds to minutes. It was not possible to infer what the animals "meant" by the sounds they made, but they were able to observe the reaction of associated animals and thus make a good guess at the social significance. It was interesting to observe in gibbons the same phenomena observed in the Central American primates, i. e., vocalization serves under certain conditions as a substitute for pugnacity. In fact certain of the types of calls served as *buffers* preventing groups coming together and hence preventing possible suffering by fighting.

One is struck by two main qualities of behaviour observed in animals, particularly primates: one is the quality of competitiveness, and the other the quality of co-operativeness and to a certain extent mutual aid. Competitive quality was noticed in the groups selecting and defending a territory, in the search for mates, etc. Examples of mutual aid were found in maternal behaviour and in what has been termed grooming. There is also considerable co-operation in reproductive behaviour. Observations showed that there is a great deal of similarity in these elements of behaviour and the behaviour of human beings.

Another interesting point of behaviour is the types of play indulged in by the young, which may be considered analogous to the same activity of human beings. Play among gibbons is restricted to young animals; seemingly when they reach the age of six or seven years they cease playing. The two main types are individual play, which is engaged in by the very young animals while they are still

carried by their mothers, and then social play, a predominantly characteristic activity of young gibbons when they are five to six months old and until they reach the age of five or six years.

In addition to the studies of gibbons in the forests, many specimens, from the very young to the very old, are being shipped to America for further studies in behaviour and anatomy. The objectives of the Expedition have been attained to a degree beyond all previous hopes.