

# THE MENTALITY OF APES

## INTRODUCTION

1. Two sets of interests lead us to test the intelligence of the higher apes. We are aware that it is a question of beings which in many ways are nearer to man than to the other ape species ; in particular it has been shown that the chemistry of their bodies, in so far as it may be perceived in the quality of the blood, and the structure of their most highly-developed organ, the brain, are more closely related to the chemistry of the human body and human brain-structure than to the chemical nature of the lower apes and *their* brain development. These beings show so many human traits in their "everyday" behaviour that the question naturally arises whether they do not behave with intelligence and insight under conditions which require such behaviour. This question expresses the first, one may say, naive, interest in the intellectual capacity of animals. We wished to ascertain the degree of relationship between anthropoid apes and man in a field which seems to us particularly important, but on which we have as yet little information.

The second aim is theoretical. Even assuming that the anthropoid ape behaves intelligently in the sense in which the word is applied to man, there is yet from the very start no doubt that he remains in this respect far behind man, becoming perplexed and making mistakes in relatively simple situations ; but it is precisely for this reason that we may, under the simplest conditions, gain knowledge of the nature of intelligent acts. The human adult seldom performs

for the *first* time in his life tasks involving intelligence of so simple a nature that they can be easily investigated; and when in more complicated tasks adult men really find a solution, they can only with difficulty observe their own procedure. So one may be allowed the expectation that in the intelligent performances of anthropoid apes we may see once more in their plastic state processes with which we have become so familiar that we can no longer immediately recognize their original form: but which, because of their very simplicity, we should treat as the logical starting-point of theoretical speculation.

As all the emphasis in the following investigations is laid on the first question, the doubt may be expressed whether it does not take for granted a particular solution of the problems treated under the second. One might say that the question whether intelligent behaviour exists among anthropoid apes can be discussed only after recognizing the theoretical necessity of distinguishing between intelligent behaviour and behaviour of any other kind; and that, since association psychology, in particular, claims to derive from one single principle all behaviour which would come under consideration here, up to the highest level, even that attained by human beings, a theoretical point of view is already assumed by the formulation of problem 1; and one which is antagonistic to association psychology.

This is a misconception. There is probably no association psychologist who does not, in his own unprejudiced observations, distinguish, and, to a certain extent, contrast, unintelligent and intelligent behaviour. For what is association psychology but the theory that one can trace back to the phenomena of a generally-known simple association type even those occurrences which, to unbiased observation, do not at first seem corresponding to that type, most of all the so-called intelligent performances? In short, it is just

these differences which are the starting-point of a strict association psychology; it is they which need to be theoretically accounted for; they are well known to the association psychologist. Thus, for instance, we find a radical representative of this school (Thorndike) stating the conclusion, drawn from experiments on dogs and cats: "I failed to find any act that even *seemed* due to reasoning." To anyone who can formulate his results thus, other behaviour must have seemed to be intelligent; he is already acquainted with the contrast in his observations, say of human beings, even if he discards it afterwards in theory.

Accordingly, if we are to inquire whether the anthropoid ape behaves intelligently, this problem can for the present be treated quite independently of theoretical assumptions, particularly those for or against the association theory. It is true that it then becomes somewhat indefinite; we are not to inquire whether anthropoid apes show something well defined, but whether their behaviour approximates to a type rather superficially known by experience, and which we call "intelligent"<sup>1</sup> in contrast to other behaviour—especially in animals. But in proceeding thus, we are only dealing according to the nature of the subject; for clear definitions have no place at the beginning of sciences founded on experience; it is only as we advance towards results that we can mark our progress by the formulation of definitions.

Moreover, the type of human and, perhaps, animal behaviour to which the first question animadverts is not quite indefinite, even without a theory. As experience shows, we do not speak of behaviour as being intelligent, when human beings or animals attain their objective by a direct unquestionable route which clearly arises naturally out of their organization. But we tend to speak of "intelligence" when, circumstances having blocked the obvious course, the human being or animal

<sup>1</sup> See foot-note, p. 219

takes a roundabout path, so meeting the situation. In unexpressed agreement with this, nearly all those observers who heretofore have sought to solve the problem of animal intelligence, have done so by watching animals in just such predicaments. Since animals below the stage of development of anthropoid apes give, in general, negative results, there has arisen out of these experiments the view widely held at present, i.e., that there is very little intelligent behaviour in animals. Only a small number of such experiments have been carried out on anthropoid apes, and they have not yet produced any very definite results. All the experiments described in the following pages are of one and the same kind : the experimenter sets up a situation in which the direct path to the objective is blocked, but a roundabout way left open. The animal is introduced into this situation, which can, potentially, be wholly surveyed. So we can see of what levels of behaviour it is capable, and, particularly, whether it can solve the problem in the possible "roundabout" way.

2. The experiments were at first applied to chimpanzees only, with the exception of a few cases taken for comparison, in which human beings, a dog, and hens were observed.

Seven of the animals belonged to the old branch of the anthropoid station which the Prussian Academy of Science maintained in Tenerife from 1912 to 1920. Of these seven the oldest, an adult female, was named Tschego, because of several characteristics which made us, perhaps wrongly, consider her a member of the Tschego species. (We are yet far from possessing a clear and systematized classification of the varieties of the chimpanzee.) The oldest of the smaller animals, called Grande, differed considerably in several respects from its comrades. But as the differences concern its general character rather than the behaviour investigated in the intelligence tests, a detailed description of them would be out of place here. The other five, two males (Sultan and

Konsul), and three females (Tercera, Rana, and Chica), were of the usual chimpanzee type.

To the seven animals mentioned, two others were added later, both of which led to valuable observations, but both of which, to our regret, soon died. I shall briefly describe them in order to give an impression of the completely different "personalities" which exist among chimpanzees.

Nueva, a female ape, about the same age as the other little animals (four to seven years at the time of the majority of our experiments), differed from them bodily in her extraordinarily broad ugly face and an obviously pathological sparsity of hair on her unhealthy skin. But her ugliness was completely offset by a nature so mild and friendly, of such naïve confidence and quiet clarity as never fell to our lot to meet with in a chimpanzee before or after. Her childlike attachment we found to some extent in other animals when they were ill, and perhaps many of Nueva's good qualities can be explained by the fact that, from the beginning, she was the prey of a slowly-advancing disease; chimpanzees, on the whole, can do with a little suppression. We were particularly impressed by the way she would play for hours, quite contentedly, with the simplest toys. Unfortunately the others tended to become lazy if they were not given any particular employment, or if they were not quarrelling, or inspecting each other's bodies. If a number of healthy children are left together all the time, without any particular occupation, the effect will not be in the line of a discreet, though playful activity either. Nueva had been kept alone for many months. One must, however, not assume that the pleasant qualities of this animal were due to earlier educational influences. Unfortunately, education does not seem able to transform a naturally mischievous and wanton chimpanzee into an amiable being; moreover, Nueva was not "brought up" in the nursery sense, on the contrary,

she showed that she was not used to being corrected at all. She regularly ate her excretions, and was first astonished and then extremely indignant when we took measures against this habit. On the second day of her stay at the station, the keeper threatened her, during this proceeding with a little stick, but she did not understand the meaning of the stick, and wanted to play with it. If food which she had, with complete naïveté, appropriated somewhere, was taken away from her she would bite, in her sudden rage, immediately; she was as yet without any inhibitions towards man; in fact, she showed herself completely naïve, and was, without doubt, less "cultured" than the station animals.

The male, Koko, judged to be about three years of age, was a type of chimpanzee not uncommonly met with: above his drum-taut stomach a pretty face with neatly parted hair, a pointed chin, and prominent eyes which seemed always discontentedly asking for something, giving the little fellow a native expression of sauciness. A large part of his existence was, in fact, spent in a kind of chronic indignation, either because there was not enough to eat, or because the children came too near him, or because someone who had just been with him left him again, or finally, because he could not remember to-day how he had solved a similar test yesterday. He would not complain; he would merely be indignant. Usually this mood was manifested by loud pommelling on the floor with both fists, and an agitated hopping up and down in one spot; in cases of great rage by glottal cramp-attacks which passed over quickly. (These we noticed also in other chimpanzees when they had attacks of rage, and very rarely in manifestations of joy.) Before such attacks, and in cases of minor excitement, he would utter a continual staccato o in that irregular characteristic rhythm which one hears from a slow-firing line of soldiers. In his angrily-uttered demands, and his wild indignation if they were not

immediately satisfied, Koko resembled another egoist *par excellence*, Sultan. Luckily—and perhaps that is no accident—Koko was, at the same time, just as gifted as Sultan.

These are only two chimpanzees. For one who has seen Koko and Nueva alive, there is no doubt that in their own way they were as much unlike as two human children with fundamentally different characters, and one can set up as a general maxim that observations of one chimpanzee should never be considered typical for all of this species of animal. The experiments we describe in the following show that there are just as great individual differences in the intellectual field.

Practically all the observations were made in the first six months of 1914.<sup>1</sup> They were frequently repeated later, but only a few additional experiments and repetitions (dating from the spring of 1916) are incorporated in this report, as, in general, the behaviour observed the first time was repeated; in any case, no important corrections had to be made in the earlier results.

3. Experiments of the kind described above may make very different calls upon the animals to be tested, according to the situation in which they are put. In order to discover, even roughly, the zone of difficulty within which the testing of chimpanzees will be of any use, Mr. E. Teuber and I gave them a problem which seemed to us difficult, but not impossible, of solution for a chimpanzee. How Sultan behaved in this test should be sketched here as a preliminary example.

A long thin string is tied to the handle of a little open basket containing fruit; an iron ring is hung in the wire-roof of the animals' playground through which the string is

<sup>1</sup> That is, they were made *before* the chimpanzees underwent optical examination (Cf these in the *Abh d Kgl Preuss. Akd d Wiss*, 1915, Phys.-Math. Section No. 3.)

pulled till the basket hangs about two metres above the ground; the free end of the string, tied into a wide open loop, is laid over the stump of a tree-branch about three metres away from the basket, and about the same height from the ground; the string forms an acute angle—the bend being at the iron ring (cf. Fig. 1). Sultan, who has not seen the preparations, but who knows the basket well from his feeding-times, is let into the playground while the observer takes his place outside the bars. The animal looks at the

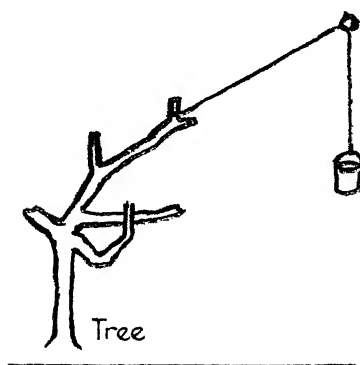


FIG. 1

hanging basket, and soon shows signs of lively agitation (on account of his unwonted isolation), thunders, in true chimpanzee style, with his feet against a wooden wall, and tries to get into touch with the other animals at the windows of the ape-house and wherever there is an outlook, and also with the observer

at the bars; but the animals are out of sight, and the observer remains indifferent. After a time, Sultan suddenly makes for the tree, climbs quickly up to the loop, stops a moment, then, watching the basket, pulls the string till the basket bumps against the ring (at the roof), lets it go again, pulls a second time more vigorously so that the basket turns over, and a banana falls out. He comes down, takes the fruit, gets up again, and now pulls so violently that the string breaks, and the whole basket falls. He clambers down, takes the basket, and goes off to eat the fruit.

Three days later, the same experiment is repeated, except that the loop is replaced by an iron ring at the end of the rope, and the ring, instead of being put over the branch, is hung



on a nail driven into a scaffolding (used for the animals' gymnastics). Sultan now shows himself free from all doubt, looks up at the basket an instant, goes straight up to the scaffolding, climbs it, pulls once at the cord, and lets it slip back, pulls again with all his might so that the cord breaks, then he clammers down, and fetches his fruit.

The best solution of the problem which could be expected would be that the animal should take the loop or iron ring off the branch or nail and simply let the basket drop, etc. The actual behaviour of the animal shows plainly that the hub of the situation, i.e., the rope connexion, is grasped as a matter of course, but the further course of action for the experiment is not very clear. The best solution is not even indicated. One cannot tell just why. Did Sultan perhaps not see the loose fixing of the loop to the branch or ring to the nail? If he had noticed it, would he have been able to solve it? Would he in any case expect the basket to fall to the ground if this fastening were loosened? Or does the difficulty lie in the fact that the basket would fall to the ground, and not straight into Sultan's hands? For we cannot even know whether Sultan really pulled at the cord to break it, and thus bring the basket to earth. So we have performed one experiment which, for a beginning, contains conditions too complicated to teach us much, and, therefore, we see the necessity of beginning the next examinations with elementary problems in which, if possible, the animals' conduct can have one meaning only.

