CONCLUSION

THE chimpanzees manifest intelligent behaviour of the general kind familiar in human beings. Not all their intelligent acts are externally similar to human acts, but under well-chosen experimental conditions, the type of intelligent conduct can always be traced. This applies, in spite of very important differences between one animal and another, even to the least gifted specimens of the species that have been observed here, and, therefore, must hold good for every member of the species, as long as it is not mentally deficient, in the pathological sense of the word. With this exception, which is presumably rare, the success of the intelligence tests in general will be more likely endangered by the person making the experiment than by the animal. One must learn and, if necessary, establish by preliminary observation, within what limits of difficulty and in what functions the chimpanzee *can possibly* show insight; negative or confused results from complicated and accidentally-chosen test-material, have obviously no bearing upon the fundamental question, and, in general, the experimenter should recognize that every intelligence test is a test, not only of the creature examined, but also of the experimenter himself. I have said that to myself quite often, and yet I have remained uncertain whether the experiments I performed may be considered "satisfactory" in this respect; without theoretical foundations, and in unknown territory, methodological mistakes may quite well have occurred; anyone who continues this work will be able to prevent them more easily.

At any rate, this remains true: Chimpanzees not only stand out against the rest of the animal world by several

morphological and, in the narrower sense, physiological, characteristics, but they also show a type of behaviour which counts as specifically human. As yet we know little of their neighbours on the other side, but according to the little we do know, with the results of this report, it is not impossible that, in this region of experimental tasks, the anthropoid is nearer to man *in intelligence too*, than to many of the lower monkey-species[1]. So far, observations agree well with the theories of evolution; in particular, the correlation between intelligence, and the development of the brain, is confirmed.

The positive result of the investigation needs a limiting determination. It is, indeed, confirmed by experiments of a somewhat different nature, which will be recounted later; but a more complete picture will be formed when they are added, and, in so far, our judgment of the intelligence of apes is left some scope. Of much greater importance is the fact that the experiments in which we tested these animals brought them into situations in which all essential conditions were actually visible, and the solution could be achieved immediately. This method of experimentation is as well adapted to the chief problem of insight as are any which can bring about the decision "yes" or "no"; in fact, it may be the very best method possible at present, as it yields very many, and very clear, results. But we must not forget that it is just in these experimental circumstances that certain factors hardly appear, or appear not at all, which are rightly considered to be of the greatest importance for *human* intelligence. We do not test at all, or rather only once in passing, how far the chimpanzee is influenced by factors not present, whether things "merely thought about" occupy him noticeably at all. And most closely connected with this, is the following problem.

[1] For reasons to be dealt with later, of course *not in applications* of intelligence. In this respect, no doubt on account of a general weakness in his whole organization, the chimpanzee is more nearly related to the lower monkeys than to man.

In the method adopted so far we have not been able to tell how far back and forward stretches the time "in which the chimpanzee lives"; for we know that, though one can prove some effects of recognition and reproduction after considerable lapses of time—as is actually the case in anthropoids—this is not the same as "life for a longer space of time".[1] A great many years spent with chimpanzees lead me to venture the opinion that, besides in the lack of speech, it is in the extremely narrow limits in *this* direction that the chief difference is to be found between anthropoids and even the most primitive human beings. The lack of an invaluable technical aid (speech) and a great limitation of those very important components of thought, so-called "images", would thus constitute the causes that prevent the chimpanzee from attaining even the smallest beginnings of cultural development. With special reference to the second fact, the chimpanzee, who is easily puzzled by the simplest optical complications, will indeed fare badly in "image-life", where even man has continually to be fighting against the running into one another, and melting together, of certain processes.

In the field of the experiments carried out here the insight of the chimpanzee shows itself to be principally determined by his optical apprehension of the situation; at times he even starts solving problems from a too visual point of view, and in many cases in which the chimpanzee *stops* acting with insight, it may have been simply that the structure of the situation was too much for his visual grasp (relative "weakness of form perception"). It is therefore difficult to give a satisfactory explanation of all his performances, so long as no detailed theory of form (*Gestalt*) has been laid as a foundation. The need for such a theory will be felt the more, when one remembers that, in this field of intelligence, *solutions* showing insight necessarily are of the same nature as the structure of

[1] Cf Appendix, p 271, seqq.

the situations, in so far as they arise in dynamic processes *co-ordinated with* the situation.

One would like to have a standard for the achievements of intelligence described here by comparing with our experiments the performances of human beings (sick and well) and, above all, human children of different ages. As the results in this book have special reference to a particular method of testing and the special test-material of optically-given situations, the psychological facts established in human beings (especially children), under the same conditions, would have to be used. But such comparisons cannot be instituted, as, very much to the disadvantage of psychology, not even the most necessary facts of this sort have been ascertained. Preliminary experiments—some have been mentioned—have given me the impression that we are inclined to over-estimate the capabilities of children of all ages up to maturity, and even adults, who have had no special technical training in this type of performance. We are in a region of *terra incognita*. Educational psychology, engaged on the well-known quantitative tests for some time, has not yet been able to test how far normal, and how far mentally-deficient, children can go in certain situations. As experiments of this kind can be performed at the very tenderest age, and are certainly as scientifically valuable as the intelligence tests usually employed, it does not matter so much if they do not become immediately practicable for school and other uses. M. Wertheimer has been expressing this view for some years in his lectures; in this place, where the lack of human standards makes itself so much felt, I should like to emphasize particularly the importance and—if the anthropoids do not deceive us—the fruitfulness of further work in this direction.

Postscript.—When I finished this book, I received from Mr. R. M. Yerkes (of Harvard University) his work entitled

The Mental Life of Monkeys and Apes: a Study in Ideational Behaviour (*Behaviour Monographs*, III, i, 1916). In this book some experiments of the type I have described are recorded. The anthropoid tested is an orang-utan, not a chimpanzee, but, as far as one can judge from the material given, the results agree with mine. Mr. Yerkes himself also thinks that insight must be attributed to the animal he tested.