

CHAPTER I

INTRODUCTION

1. A BRIEF OUTLINE OF PROCEDURE

The study of the process of perceiving has of late years received less attention than formerly, and general interest has turned rather to the study of learning and remembering. Apart from the thorough and co-ordinated studies of the Gestalt school, experimental work on perception has been rather disjointed and purposeless, largely, one may suppose, because no very outstanding theories have been devised, except by that school, to include all the known facts. It may be that no comprehensive theories are needful or possible to cover all the diverse manifestations of the perceptual processes, and that the pursuit of such theories is chimaerical, at least in the present state of our knowledge. But to decide this, the earnest seeker must first obtain a thorough knowledge of the experimental discoveries relating to the perceptual processes, their functional nature and the outcome of their operations. Though most psychological text-books include a selection of the known facts, there is not, to the author's knowledge, any comprehensive and detailed collection of these.¹ Consequently the aim of this book has been to present a treatment as thorough as possible, and as far as possible without preconceived theoretical bias, of the experimental work which has been carried out and of its essential results.

In general, any far-reaching theoretical discussion has been omitted, though, in achieving a logical arrangement of the material, certain important hypotheses and arguments have

¹ An admirable brief account of the subject is given by A. W. Wolters in *The Evidence of Our Senses*; but this cannot of necessity include any detailed treatment of experimental work.

been included which were derived from experiment and which in turn determined its further course. From this mutual reinforcement of experiment and hypothesis it is left for the student to draw his own conclusions as to the feasibility or desirability of comprehensive and co-ordinating theories. We have indicated from time to time the importance of the concepts of form and structure, and the possibility that they might be extended from the work of the Gestalt school itself to cover other experimental results. But the full implications of these concepts are not at present known. Thus it appears to the author that the time is not yet ripe for the thorough-going application of the *Gestalt Theorie* to all the known facts; let us not therefore degrade it to the status of a universal explanatory principle which becomes meaningless when indiscriminately applied. “We see through a glass darkly.” If the explanations given are halting and incomplete, they are the less likely to blind the eyes to the full implications of the experimental results which they attempt to explain and co-ordinate.

In addition, the limitations of time and space have made it necessary to confine this book to the study of visual perception alone. But this is the less serious a defect in that experimental work on visual perception bulks more largely than that on all the other perceptual modes together.

The subject-matter of the book falls into four main sections. In the first we have tried to trace the phenomenal development of the perceptual process, from its primary inception to its ultimate fulfilment in the understanding of meaning and the appropriate reaction tendencies; and to show how it is linked to various secondary sensory and imaginal processes. A separate chapter has been devoted to the important, if bygone, controversy as to the relation of imagery to meaning in the perception of words. This differentiation of the various constituents of the perceptual process may seem to denote a return to the old atomistic approach. We have, it is true, endeavoured to analyse the phenomenal aspects of the perceptual process, always confining our analysis to those partial

A BRIEF OUTLINE OF PROCEDURE 3

processes and stages of development which have actually been experienced in experimental situations. Moreover, we have from time to time qualified our acceptance of the reality of these constituents, emphasizing the importance of making allowance for the preconceived ideas and the theoretical bias of experimenter and observers, which may have exerted an influence of undetermined extent upon the instructions and interpretations of the one, and upon the observations and reports of the others.

As a pendant to this functional analysis, we give a brief statement of the 'structuralist' position, indicating that it seems to involve an undue rigidity in the analysis and classification of the types of awareness. From this we pass to the second and third sections of the book which deal with the percept or perceptual content. It is perhaps to be deplored that we devote more attention to the perceptual content than to the perceptual process; this is, however, inevitable, since the experimental work on the former subject is far more extensive; doubtless it is far easier to perform! The second section deals with the relation of the perceptual content to some of the more important affective and *quasi*-affective individual states; the third, with the objective structure of the perceptual field. The physical nature of the latter is considered only briefly; but several chapters are devoted to that intimate relationship between objective structure, and the schematic arrangement of the perceptual content which is termed 'form', 'configuration' or 'Gestalt'. Here again we have confined our description largely to experimental results and the immediate deductions therefrom. Many books have appeared which deal exhaustively with the *Gestalt Theorie*. We have endeavoured to treat the experimental work of the configurational school from a humbler standpoint, indicating which results appear to be empirically valuable without assessing their ultimate theoretical significance.

In the fourth section we have briefly described some aspects of the genetic development in childhood of the perceptual

content. These are as yet only partially adapted to the configurational outlook; while the classification of individual differences, to which we finally turn, has been evolved from quite another theoretical standpoint. If the Gestalt psychologist has been over-forgetful of the existence of individual differences, the typologist has attributed to them a rigidity and consistency which others than he find hard to credit. We feel moved to plead that the typological classification be reserved as a mere shorthand expression for types of difference, not as implying the existence of segregated types of individuals. If we are content to take typology at its face value, we may find much that is useful and important in the experimental results obtained by its exponents.

A brief account of the principal tachistoscopes in use is given in the Appendix. It seemed desirable to include some description of the tachistoscope because it has been very commonly employed in obtaining the experimental results described in this book; moreover, it is possible that its limitations, mentioned in the first part of the Appendix, may have exerted a deleterious influence upon these experimental results. Finally, the student who is interested in apparatus may here obtain information as to the various tachistoscopes in use, their efficiency and their ease of construction.

2. THE NATURE OF THE PERCEPTUAL PROCESS

We should without doubt begin the discussion of visual perception by defining its essential nature. But such a definition might well be unsatisfactorily incomplete, if not definitely misleading. Thus we shall content ourselves by indicating briefly what we take for experimental purposes to be the essential aspects of the perceptual process. This process undoubtedly originates in the excitation of the sense organs by some part of the external environment; the excitation is conveyed by the sensory nerves to the central nervous system, where occurs a process of mental elaboration, from which issues the percept as we know it. Of the sensory stage we

THE NATURE OF THE PERCEPTUAL PROCESS 5

know nothing directly. The work of Adrian and Matthews has shown that remarkably little differentiation as to the qualities of sensation exists in the discharge along the sensory nerves, although changes in intensity and duration of stimulation are reflected by changes in the frequency of discharge, and changes in extensity by changes in the number of end organs and nerve fibres discharging. (According to Hecht, the number of retinal elements responding is also a function of intensity of stimulation.) The locus of colour differentiation in vision is still in doubt. Thus we may infer that only a gross differentiation as regards intensity, extensity and duration exists outside the cerebral cortex of the central nervous system.¹ For the purposes of convenience we shall omit any detailed consideration of what is frequently termed 'sensation', namely, the aspects of the percept which are more immediately determined by the intensity, duration, extensity and wave-length of stimulation, and the retinal area stimulated. Moreover, these aspects are most adequately dealt with by Sir John Parsons in *Colour Vision* and *An Introduction to the Theory of Perception*.

There appear to be three essential aspects of the completed perceptual process, once it has passed the stage of peripheral sensory excitation:

(1) A constructional process wherein the sensory qualities are suitably weighted and combined, each in its appropriate degree of importance, into a more or less clearly differentiated formal structure.

(2) An assimilative process whereby the present percept is related to the body of past experience—compared, accepted or rejected—and is then referred back to some part of the external environment from which it is assumed to have originated.

¹ Adrian⁽¹⁾ has also shown that the sensory discharges corresponding to the different sensory modes differ very little from one another. Though the nature of the peripheral mechanism exerts a certain determination, we can no longer assume the universal validity of the law of specific sensibility.

(3) A response tendency, indicating the observer's reaction, overt or implicit, to the full implications of the percept.

The differentiation of these aspects may be purely logical; for all we know they exist simultaneously, and are inextricably inter-related, though sometimes one, sometimes another, appears most clearly in awareness. Moreover, all seem to contribute to the understanding of meaning. In chap. III we have tried to indicate some of the essential and outstanding characteristics of the process of understanding meaning. Here it is sufficient to note that the perceptual process cannot be regarded as complete until understanding has taken place, and that the meaning of a percept seems to include the conscious recognition of structural characteristics, of relation to past experience and to consciousness as a whole, and of the appropriate response to the perceptual situation. (Though no doubt unconscious relationships and responses are necessary to the fulfilment of the perceptual process, it seems improbable that they contribute directly to the understanding of meaning until and unless they reach consciousness.)

Here then is a brief outline of what we take to be the essential aspects of the perceptual process. In the next chapter we shall endeavour to show how they have been demonstrated and elucidated under experimental conditions.

CHAPTER II

STAGES IN THE PERCEPTUAL PROCESS

1. THE CONDITIONS OF INVESTIGATION

Although the perceptual process is essentially a unitary whole, and may frequently, when it is rapid and uninterrupted, appear to be unanalysable, yet it is possible in some circumstances to observe certain stages which occur before it becomes complete, and certain secondary processes which may contribute to its full development. As Michotte⁽²⁵¹⁾ has pointed out, this analysis can be facilitated objectively, by various methods of simplification and modification of the perceptual stimulus, or by shortening the time of exposure of the stimulus, as is done in using the tachistoscope. In this manner, the process can be arrested at some stage of incompleteness. Alternatively, the completion of the process can be retarded by making perception difficult; the stimulus field may be complex, ambiguous, unclear or dimly illuminated. In all these cases it is necessary to instruct the observer to direct his observation to the gradual development of the percept, or to some particular stage or part of it. But it is important to remember that we are not justified in concluding that the process thus analysed, interrupted or retarded, is identical with the process which would have occurred under ordinary conditions. In particular, the direction of the observer's awareness to some particular part of the process may give it an altogether artificial prominence and importance. We cannot even be sure that certain secondary attendant processes, such as imaging, may not in some cases be actually aroused by instructions to observe their occurrence. All that we can hope to do is to point to some of the phenomena which occur most frequently, if not universally,

8 STAGES IN THE PERCEPTUAL PROCESS

under these conditions; and to decide with greater or less assurance if they are normal and essential constituents of the perceptual process.

2. THE FUNDAMENTAL STAGES IN THE PROCESS OF PERCEIVING

Although a number of different experimental methods and different types of experimental material have been employed by the various workers upon this problem, there seems to be a fair amount of agreement between the latter as to the fundamental stages which may be observed in the development of full apprehension and knowledge of the nature of the objects exposed. The first of these stages seems to consist of a *vague awareness* or knowledge that there is something there in the visual field. Davies⁽⁶²⁾, exposing a series of large simple geometrical forms by means of a short flash of light in a dark room, found that there was a primary consciousness of light occurring before any consciousness of form. Helson and Fehrer⁽¹⁵³⁾ also found that when simple geometrical forms of very low brightness were exposed, the observer was aware of the appearance of light at a much lower intensity than was necessary for the appearance of form. This awareness of light is, however, followed immediately, if not superseded, by the vague impression of an indefinite object in the field. This was the first stage obtained by the observers of Galli⁽¹⁰⁸⁾ and of Zigler, Cook, Miller and Wimple⁽³⁷⁷⁾, as simple geometrical forms were moved gradually inwards from the periphery to the centre of the visual field. A similar phase was reported by Gemelli⁽¹¹⁷⁾ in the cinematographic presentation of meaningful figures. The first stage found by Dickinson⁽⁶⁷⁾ in the tachistoscopic perception of groups of letters and of playing cards was the experience of a visual pattern having 'thereness' or flat clearness without any logical meaning. This seems to indicate a rather more fully developed state of the percept; as does also Freeman's report⁽¹⁰²⁾ that during the first stage of the perception of meaningless ink-blots the general extent

FUNDAMENTAL STAGES OF PERCEIVING 9

and position of the form was determined and qualified—whether it was near or far, to the right or to the left. Throughout these descriptions of the first stage, however, runs the note of vagueness and uncertainty; this has been characterized by Bartlett(9) as ‘having a feeling of’ or ‘an impression of’ something.

As the awareness of the existence of the object in the visual field becomes more certain, we pass on to the next stage, which has been called by Dickinson(67) and Freeman(102) the stage of the *generic object*—the awareness that the visual stimulation is connected with some kind of object with an existence in the visual field. Moreover this object falls into some general category of objects, or bears a similarity to some known class of object (Galli(108)). This knowledge usually results from a partial differentiation of the total visual field, whereby certain parts stand out more clearly, and assume more importance than their surroundings (Dickinson(67)); certain details may be noted as significant in the interpretation of the perceptual situation (Freeman(102)). Thus at this stage the grouping or organization of the field begins (Gemelli(117)). As this organization becomes more and more detailed and complete, the relevant and important parts rise out of the field, the rest of which fades into the background (Freeman). These parts, and especially their more important details, take on specific characteristics. That is to say, they are recognized as appertaining to some particular and specific object; and this stage is called the stage of the *specific object*. The form characteristics of the field, or rather, of the relevant and important parts of it, are now fully recognized; the conscious reception of the pattern of visual stimulation is complete.

The next stage is the *understanding of meaning*. The visual pattern takes on the meaning of a form or object in the external world. The essential nature of this stage is clearly shown in the introspections of the observers in Bartlett’s experiments(9) on perception; they experienced an ‘effort after meaning’, a conative drive towards the completion of the

10 *STAGES IN THE PERCEPTUAL PROCESS*

perceptual process by the attribution of meaning. Even for the child and the unsophisticated adult the understanding of meaning is in itself a process of enormous complexity and extreme difficulty of analysis. Such an analysis is at present impossible by the methods of experimental psychology. We shall discuss subsequently certain experimental observations which appear to bear upon the understanding of meaning of words. Here it is sufficient to indicate that it usually includes an element of familiarity—as Freeman⁽¹⁰²⁾ expresses it, the feeling: “I know what you are”; the awareness of having met before with some comparable object or situation. And this in turn implies a tendency to the correct response or reaction; the meaning, when fully understood, includes a knowledge of how to deal with this particular perceptual situation. In the case of real objects the primary unitary meaning consciousness breaks down into categories of experience such as: “What is the use of it?”; or “What is it made of?” When the meaning is not fully understood, an effort to obtain further perceptual information is usually suggested. Hence we are justified in making our original statement, that the perceptual process when complete includes some form of response tendency (Judd⁽¹⁸⁶⁾).

A very frequent form of overt response is the *naming* of the perceptual form or object (Gemelli⁽¹¹⁷⁾). In naming, the classification of this form is completed, and its resemblance and relationship to the background of experience is openly recognized and designated. Its meaning is understood, and, in many cases, completely determined, delimited and described. Thus naming often is the most satisfactory of all responses to any perceptual situation; and hence the frequency of its occurrence.