and when in the autumn of that year Dr. Ellis came for two years to Amherst, we embarked together on the painstaking task of revising his first drafts.

When we started, the main part of the work was done; with a very few exceptions all the articles now contained in this volume had been transcribed from the German. But nobody who has not undertaken a similar kind of work can judge of the difficulties inherent in it. Two problems, neither of them easy, have to be solved: condensation and translation. Condensation was necessary in order to unite the great number of contributions in one manageable volume; and to select properly was the chief difficulty in condensing. The main features, the great lines of a book or article had to be preserved; subsidiary detail, however interesting in itself, had often to be sacrificed.

Translating, even where it was not a literal rendering of the original text but a condensation, had to be as faithful to the intention of the author as possible, and at the same time to result in a readable English text. Here the difficulty lay often in reconciling the demand for good English with the wish to reproduce the characteristic style of an author. The reader will understand that perfection was even less attainable than in other human enterprises and that much criticism is still justified. I can assure him, however, that the author of this book spared no effort to do full justice to the work of which he has become the mediator. The difficulties which arose at different occasions might have caused a less patient worker, one less devoted to his task, either to abandon the work completely or to finish it quickly without bothering any more about the niceties of style and meaning. Dr. Ellis never lost patience or courage, and to the end was guided by loyalty to his authors and their work.

This is a source-book, and therefore it has to be historically reliable in the sense that the translator had to give what the author actually said, not what he might have said had he written at a later date.

Does my very personal interest in the book and the material it contains deprive me of the right to wish it all possible success in the sense that it fills satisfactorily a need felt by students of psychology?

K. KOFFKA.

Northampton, Mass.
January, 1938.

I. GENERAL PROBLEMS

SELECTION 1

GESTALT THEORY

By MAX WERTHEIMER

Über Gestalttheorie [an address before the Kant Society, Berlin, 17th December, 1924]. Erlangen, 1925.

39 What is Gestalt theory and what does it intend? Gestalt theory was the outcome of concrete investigations in psychology, logic, and epistemology. The prevailing situation at the time of its origin may be briefly sketched as follows. We go from the world of everyday events to that of science, and not unnaturally assume that in making this transition we shall gain a deeper and more precise understanding of essentials. The transition *should* mark an advance. And yet, though one may have learned a great deal, one is poorer than before. It is the same in psychology. Here too we find science intent upon a systematic collection of data, yet often excluding through that very activity precisely *that* which is most vivid and real in the living phenomena it studies. Somehow the thing that matters has eluded us.

40 What happens when a problem is solved, when one suddenly "sees the point"? Common as this experience is, we seek in vain for it in the textbooks of psychology. Of things arid, poor, and inessential there is an abundance, but that which really matters is missing. Instead we are told of formation of concepts, of abstraction and generalization, of class concepts and judgments, perhaps of associations, creative phantasy, intuitions, talents—anything but an answer to our original problem. And what are these last words but *names* for the problem? Where are the penetrating answers? Psychology is replete with terms of great potentiality—personality, essence, intuition, and the rest. But when one seeks to grasp their concrete content, such terms fail.

This is the situation and it is characteristic of modern science that the same problem should appear everywhere. Several attempts have been made to remedy the matter. One was a frank defeatism preaching the severance of science and life: there are
41 regions which are inaccessible to science. Other theories established a sharp distinction between the natural and moral sciences: the

exactitude and precision of chemistry and physics are characteristic of natural science, but "scientific" accuracy has no place in a study of the mind and its ways. This must be renounced in favour of *other* categories.

Without pausing for further examples, let us consider rather a question naturally underlying the whole discussion: Is "*science*" really the kind of thing we have implied? The word science has often suggested a certain outlook, certain fundamental assumptions, certain procedures and attitudes—but do these imply that this is the only possibility of scientific method? Perhaps science already embodies methods leading in an entirely different direction, methods which have been continually stifled by the seemingly necessary, dominant ones. It is conceivable, for instance, that a host of facts and problems have been concealed rather than illuminated by the prevailing scientific tradition. Even though the traditional methods of science are undoubtedly adequate in
42 many cases, there may be others where they lead us astray. Perhaps something in the very nature of the traditional outlook may have led its exponents at times to ignore precisely that which is truly essential.

Gestalt theory will not be satisfied with sham solutions suggested by a simple dichotomy of science and life. Instead, Gestalt theory is resolved to penetrate the *problem* itself by examining the fundamental assumptions of science. It has long seemed obvious—and is, in fact, the characteristic tone of European science—that "science" means breaking up complexes into their component elements. Isolate the elements, discover their laws, then reassemble them, and the problem is solved. All wholes are reduced to pieces and piecewise relations between pieces.

43 The fundamental "formula" of Gestalt theory might be expressed in this way [1]: There are wholes, the behaviour of which is not determined by that of their individual elements, but where the part-processes are themselves determined by the intrinsic nature of the whole. It is the hope of Gestalt theory to determine the nature of such wholes.

With a formula such as this, one might close, for Gestalt theory is neither more nor less than this. It is not interested in puzzling out philosophic questions which such a formula might suggest.

[1] "Man könnte das Grundproblem der Gestalttheorie etwa so zu formulieren suchen: Es gibt Zusammenhänge, bei denen nicht, was im Ganzen geschieht, sich daraus herleitet, wie die einzelne Stücke sind und sich zusammensetzen, sondern umgekehrt, wo—im prägnanten Fall—sich *das, was an einem Teil dieses Ganzen geschieht, bestimmt von inneren Strukturgesetzen dieses seines Ganzen.*"

Gestalt theory has to do with concrete research; it is not only an *outcome* but a *device*: not only a theory *about* results but a means toward further discoveries. This is not merely the proposal of one or more problems but an attempt to *see* what is really taking place in science. This problem cannot be solved by listing possibilities for systematization, classification, and arrangement. If it is to be attacked at all, we must be guided by the spirit of the new method and by the concrete nature of the things themselves which we are studying, and set ourselves to penetrate to that which is really given by nature.

44 There is another difficulty that may be illustrated by the following example. Suppose a mathematician shows you a proposition and you begin to "classify" it. This proposition, you say, is of such and such type, belongs in this or that historical category, and so on. Is that how the mathematician works?

"Why, you haven't grasped the thing at all," the mathematician will exclaim. "See here, this formula is not an independent, closed fact that can be dealt with for itself alone. You must see its dynamic *functional* relationship to the whole from which it was lifted or you will never understand it."

What holds for the mathematical formula applies also to the "formula" of Gestalt theory. The attempt of Gestalt theory to disclose the functional meaning of its own formula is no less strict than is the mathematician's. The attempt to explain Gestalt theory in a short essay is the more difficult because of the terms which are used: part, whole, intrinsic determination. All of them have in the past been the topic of endless discussions where each disputant has understood them differently. And even worse has been the cataloguing attitude adopted toward them. What they *lacked* has been actual research. Like many another "philosophic" problem they have been withheld from contact with reality and scientific work.

45 About all I can hope for in so short a discussion is to suggest a few of the problems which at present occupy the attention of Gestalt theory and something of the way they are being attacked.

To repeat: the *problem* has not merely to do with scientific work—it is a fundamental problem of our times. Gestalt theory is not something suddenly and unexpectedly dropped upon us from above; it is, rather, a palpable convergence of problems ranging throughout the sciences and the various philosophic standpoints of modern times.

Let us take, for example, an event in the history of psychology.

One turned from a living experience to science and asked what it had to say about this experience, and one found an assortment of elements, sensations, images, feelings, acts of will and laws governing these elements—and was told, "Take your choice, reconstruct from them the experience you had." Such procedure led to difficulties in concrete psychological research and to the emergence of problems which defied solution by the traditional analytic methods. Historically the most important impulse came from v. Ehrenfels who raised the following problem. Psychology
46 had said that experience is a compound of elements: we hear a melody and then, upon hearing it again, memory enables us to recognize it. But what is it that enables us to recognize the melody when it is played in a new key? The sum of the elements is different, yet the melody is the same; indeed, one is often not even aware that a transposition has been made.

When in retrospect we consider the prevailing situation we are struck by two aspects of v. Ehrenfels's thesis; on the one hand one is surprised at the essentially summative character of his theory, on the other one admires his courage in propounding and defending his proposition. Strictly interpreted, v. Ehrenfels's position was this: I play a familiar melody of six tones and employ six *new* tones, yet you recognize the melody despite the change. There must be a something *more* than the sum of six tones, viz. a seventh something, which is the form-quality, the *Gestaltqualität*, of the original six. It is this *seventh* factor or element which enabled you to recognize the melody despite its transposition.

However strange this view may seem, it shares with many another subsequently abandoned hypothesis the honour of having clearly seen and emphasized a fundamental problem.

47 But other explanations were also proposed. One maintained that in addition to the six tones there were intervals—relations—and that *these* were what remained constant. In other words we are asked to assume not only elements but "relations-between-elements" as additional components of the total complex. But this view failed to account for the phenomenon because in some cases the relations *too* may be altered without destroying the original melody.

Another type of explanation, also designed to bolster the elementaristic hypothesis, was that *to* this total of six or more tones there come certain "higher processes" which operate upon the given material to "*produce*" unity.[1]

This was the situation until Gestalt theory raised the radical

[1] Compare *Selection 32*, below.

question: Is it really true that when I hear a melody I have a *sum* of individual tones (pieces) which constitute the primary foundation of my experience? Is not perhaps the reverse of this true? What I really have, what I hear of each individual note, what I experience at each place in the melody is a *part* which is itself determined by the character of the whole. What is given me by the melody does not arise (through the agency of any auxiliary factor) as a *secondary* process from the sum of the pieces as such. Instead, what takes place in each single part already depends upon what the whole is. The flesh and blood of a tone depends from the start upon its role in the melody: a *b* as leading tone to *c* is something radically different from the *b* as tonic. It belongs to the flesh and blood of the things given in experience [*Gegebenheiten*], how, in what role, in what function they are in their whole.

48 Let us leave the melody example and turn to another field. Take the case of threshold phenomena. It has long been held that a certain stimulus necessarily produces a certain sensation. Thus, when two stimuli are sufficiently different, the sensations also will be different. Psychology is filled with careful inquiries regarding threshold phenomena. To account for the difficulties constantly being encountered it was assumed that these phenomena must be influenced by higher mental functions, judgments, illusions, attention, etc. And this continued until the radical question was raised: Is it really true that a specific stimulus *always* gives rise to the same sensation? Perhaps the prevailing whole-conditions will themselves determine the effect of stimulation? This kind of formulation leads to experimentation, and experiments show, for example, that when I see two colours the sensations I have are determined by the whole-conditions of the entire stimulus situation. Thus, also, the same local *physical* stimulus pattern can give rise to either a unitary and homogeneous figure, or to an articulated figure with different parts, all depending upon the whole-conditions which may favour either unity or articulation. Obviously the task, then, is to investigate these "whole-conditions" and discover what influences they exert upon experience.

49 Advancing another step we come to the question whether perhaps any part depends upon the particular whole in which it occurs. Experiments, largely on vision, have answered this question in the affirmative. Among other things they demand that the traditional theory of visual contrast be replaced by a theory which takes account of whole-part conditions.[1]

[1] See, e.g., *Selection 8*.

50 Our next point is that my field comprises also my Ego. There is not from the beginning an Ego over-against others, but the genesis of an Ego offers one of the most fascinating problems, the solution of which seems to lie in Gestalt principles. However, once constituted, the Ego is a functional part of the total field. Proceeding as before we may therefore ask: What happens to the Ego as a part of the field? Is the resulting behaviour the piecewise sort of thing associationism, experience theory, and the like, would have us believe? Experimental results contradict this interpretation and again we often find that the laws of whole-processes operative in such a field tend toward a meaningful behaviour of its parts.

This field is not a summation of sense data and no description of it which considers such separate pieces to be *primary* will be correct. If it were, then for children, primitive peoples and animals experience would be nothing but piece-sensations. The next most developed creatures would have, in addition to independent sensations, something higher, and so on. But this whole picture is the opposite of what actual inquiry has disclosed. We have learned to recognize the "sensations" of our textbooks
51 as products of a late culture utterly different from the experiences of more primitive stages. Who experiences the sensation of a specific red in that sense? What the man of the streets, children, or primitive men normally react to is something coloured but at the same time exciting, gay, strong, or affecting—*not* "sensations".

The programme to treat the organism as a part in a larger field necessitates the reformulation of the problem as to the relation between organism and environment. The stimulus-sensation connection must be replaced by a connection between alteration in the field conditions, the vital situation, and the total reaction of the organism by a change in its attitude, striving, and feeling.

There is, however, another step to be considered. A man is not only a part of his field, he is also one among other men. When a group of people work together it rarely occurs, and then only under very special conditions, that they constitute a mere sum of independent Egos. Instead the common enterprise often becomes their mutual concern and each works *as* a meaningfully functioning part of the whole. Consider a group of South Sea Islanders
52 engaged in some community occupation, or a group of children playing together. Only under very special circumstances does an "I" stand out alone. Then the balance which obtained during harmonious and systematic occupation may be upset and give

way to a surrogate (under certain conditions, pathological) *new* balance.[1]

Further discussion of this point would carry us into the work of social and cultural science which cannot be followed here. Instead let us consider certain other illustrations. What was said above of stimulus and sensation is applicable to physiology and the biological sciences no less than to psychology. It has been tried, for example, by postulating sums of more and more special apparatus, to account for meaningful or, as it is often called,
53 purposive behaviour. Once more we find meaninglessly combined reflexes taken for granted although it is probable that even with minute organisms it is not true that a piece-stimulus automatically bring about its corresponding piece-effect.

Opposing this view is *vitalism* which, however, as it appears to Gestalt theory, also errs in its efforts to solve the problem, for it, too, begins with the assumption that natural occurrences are themselves essentially blind and haphazard—and *adds* a mystical something over and above them which imposes order. Vitalism fails to inquire of physical events whether a genuine order might not already prevail amongst them. And yet nature *does* exhibit numerous instances of physical wholes in which part events are determined by the inner structure of the whole.[2]

These brief references to biology will suffice to remind us that whole-phenomena are not "merely" psychological, but appear in other sciences as well. Obviously, therefore, the problem is not solved by separating off various provinces of science and classifying whole-phenomena as something peculiar to psychology.

54 The fundamental question can be very simply stated: Are the parts of a given whole determined by the inner structure of that whole, or are the events such that, as independent, piecemeal, fortuitous and blind the total activity is a sum of the part-activities? Human beings can, of course, *devise* a kind of physics of their own—e.g. a sequence of machines—exemplifying the latter half of our question, but this does not signify that *all natural* phenomena are of this type. Here is a place where Gestalt theory is least easily understood and this because of the great number of prejudices about nature which have accumulated during the centuries. Nature is thought of as something essentially blind in its laws, where whatever takes place in the whole is purely a sum of individual

[1] [The suggestions given in this paragraph have been worked out in further detail by Schulte. *Selection 31.*]

[2] See *Selection 3.*

occurrences. This view was the natural result of the struggle which physics has always had to purge itself of teleology. To-day it can be seen that we are obliged to traverse other routes than those suggested by this kind of purposivism.

Let us proceed another step and ask: How does all this stand with regard to the problem of body and mind? What does my knowledge of another's mental experiences amount to and how do I obtain it? There are, of course, old and established dogmas on these points: The mental and physical are wholly heterogeneous: there obtains between them an absolute dichotomy. (From this point of departure philosophers have drawn an array of metaphysical deductions so as to attribute all the good qualities to mind while reserving for nature the odious.) As regards the
55 second question, my discerning mental phenomena in others is traditionally explained as inference by analogy. Strictly interpreted the principle here is that something mental is meaninglessly coupled with something physical. I observe the physical and infer the mental from it more or less according to the following scheme: I see someone press a button on the wall and infer that he wants the light to go on. There *may be* couplings of this sort. However, many scientists have been disturbed by this dualism and have tried to save themselves by recourse to very curious hypotheses. Indeed, the ordinary person would violently refuse to believe that when he sees his companion startled, frightened, or angry he is seeing only certain physical occurrences which themselves have nothing to do (in their inner nature) with the mental, being only superficially coupled with it: you have frequently seen this and this combined . . . etc. There have been many attempts to surmount this problem. One speaks, for example, of *intuition* and says there can be no other possibility, for I *see* my companion's fear. It is not true, argue the intuitionists, that I see only the bare bodily activities meaninglessly coupled with other and invisible activities. However inadmissible it may otherwise be, an intuition theory does have at least this in its favour, it shows a suspicion that the traditional procedure might be successfully reversed. But the word intuition is at best only a *naming* of that which we must strive to lay hold of.

This and other hypotheses, apprehended as they now are, will not advance scientific pursuit, for science demands fruitful penetration, not mere cataloguing and systematization. But the question is,
56 How does the matter really stand? Looking more closely we find a third assumption, namely that a process such as fear is a matter of

consciousness. Is this true? Suppose you see a person who is kindly or benevolent. Does anyone suppose that this person is feeling mawkish? No one could possibly believe that. The characteristic feature of such behaviour has very little to do with consciousness. It has been one of the easiest contrivances of philosophy to identify a man's real behaviour and the direction of his mind with his consciousness. Parenthetically, in the opinion of many people the distinction between idealism and materialism implies that between the noble and the ignoble. Yet does one really mean by this to contrast consciousness with the blithesome budding of trees? Indeed, what is there so repugnant about the materialistic and mechanical? What is so attractive about the idealistic? Does it come from the *material* qualities of the connected pieces? Broadly speaking most psychological theories and textbooks, despite their continued emphasis upon consciousness, are far more "materialistic", arid, and spiritless than a living tree—which probably has no consciousness at all. The point is not what the material pieces are, but what *kind* of whole it is. Proceeding in terms of specific problems one soon realizes how many bodily activities there are which give no hint of a separation between body and mind. Imagine a dance, a dance full of grace and joy. What is the situation in such a dance? Do we have a summation of *physical* limb movements and a *psychical* consciousness? No. Obviously this answer does not solve the problem; we have to start anew—and it seems to me that a proper and fruitful point of attack has been discovered.[1] One finds many processes which, in their dynamical form, are identical regardless of variations in
57 the material character of their elements. When a man is timid, afraid or energetic, happy or sad, it can often be shown that the course of his physical processes is Gestalt-identical with the course pursued by the mental processes.

Again I can only indicate the direction of thought. I have touched on the question of body and mind merely to show that the problem we are discussing also has its philosophic aspects. To strengthen the import of the foregoing suggestions let us consider the fields of epistemology and logic. For centuries the assumption has prevailed that our world is essentially a summation of elements. For Hume and largely also for Kant the world is like a bundle of fragments, and the dogma of meaningless summations continues to play its part. As for logic, it supplies: *concepts*, which when rigorously viewed are but sums of properties; *classes*,

[1] Compare *Selection 17*.

which upon closer inspection prove to be mere catchalls ; *syllogisms*, devised by arbitrarily lumping together any two propositions having the character that . . . etc. When one considers what a concept *is* in living thought, what it really means to grasp a conclusion ; when one considers what the crucial thing *is* about a mathematical proof and the concrete interrelationships it involves, one sees that the categories of traditional logic have accomplished nothing in this direction.[1]

58 It is our task to inquire whether a logic is possible which is *not* piecemeal. Indeed the same question arises in mathematics also. Is it *necessary* that all mathematics be established upon a piecewise basis ? What sort of mathematical system would it be in which this were *not* the case ? There have been attempts to answer the latter question but almost always they have fallen back in the end upon the old procedures. This fate has overtaken many, for the result of training in piecewise thinking is extraordinarily tenacious. It is not enough and certainly does not constitute a solution of the principal problem if one shows that the axioms of mathematics are both piecemeal and at the same time evince something of the opposite character. The problem has been scientifically grasped only when an attack specifically designed to yield positive results has been launched. Just how this attack is to be made seems to many mathematicians a colossal problem, but perhaps the quantum theory will force the mathematicians to attack it.

59 This brings us to the close of an attempt to present a view of the problem as illustrated by its specific appearances in various fields. In concluding I may suggest a certain unification of these illustrations somewhat as follows. I consider the situation from the point of view of a theory of aggregates and say : How should a world be where science, concepts, inquiry, investigation, and comprehension of inner unities were impossible ? The answer is obvious. This world would be a manifold of disparate pieces. Secondly, what kind of world would there have to be in which a piecewise science would apply ? The answer is again quite simple, for here one needs only a system of recurrent couplings that are blind and piecewise in character, whereupon everything is available for a pursuit of the traditional piecewise methods of logic, mathematics, and science generally in so far as these presuppose this kind of world. But there is a third kind of aggregate which has been but cursorily investigated. These are the aggregates

[1] Compare in this connection *Selection 23*.

in which a manifold is not compounded from adjacently situated pieces but rather such that a term at its place in that aggregate is determined by the whole-laws of the aggregate itself.

Pictorially : suppose the world were a vast plateau upon which were many musicians. I walk about listening and watching the players. First suppose that the world is a meaningless plurality. Everyone does as he will, each for himself. What happens together when I hear ten players might be the basis for my guessing as to what they all are doing, but this is merely a matter of chance and probability much as in the kinetics of gas molecules.—A second possibility would be that each time one musician played *e*, another played *f* so and so many seconds later. I work out a theory of blind couplings but the playing as a whole remains meaningless. This is what many people think physics does, but the real work of physics belies this.—The third possibility is, say, a Beethoven symphony where it would be possible for one to select one part of the whole and work from that towards an idea of the structural principle motivating and determining the whole. Here the fundamental laws are not those of fortuitous pieces, but concern the very character of the event.