The Theory of Perception According to Gestalt Psychology

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THE THEORY OF PERCEPTION ACCORDING
TO GESTALT PSYCHOLOGY

by

Thomas J. Zuber

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the Requirements of the Degree of
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TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. HISTORY AND INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>II. GESTALT PERCEPTION</td>
<td>20</td>
</tr>
<tr>
<td>III. THE THEORY OF ISOMORPHISM</td>
<td>46</td>
</tr>
<tr>
<td>Reason for origin of theory—Brief conspectus of theory—Historical background of theory—Köhler’s application and experimentation in geographical environment—Hypotheses concerning physiological environment—Experimental data for physiological environment—Details and further explanations relevant to physiological environment.</td>
<td></td>
</tr>
<tr>
<td>IV. IMPLICATIONS AND CRITICISM</td>
<td>71</td>
</tr>
<tr>
<td>BIBLIOGRAPHY</td>
<td>93</td>
</tr>
</tbody>
</table>
CHAPTER I

HISTORICAL BACKGROUND

The problem of unity and multiplicity in psychology is an old one, dating back to Aristotle and man's first notions of psychology as a science. Aristotle's doctrine of matter and form provided the philosophical basis for a psychology which held man to be one substance, a composite of body and soul. St. Thomas Aquinas christianized Aristotelian psychology and developed it into a unified system. This Thomistic system was one of the greatest influences in philosophical and psychological thought up to the seventeenth century.\(^1\) Medieval man, therefore, had a simple outlook on himself and the things about him. He was a single unified being with one final goal in life, unity with God. All the other things on earth had but one purpose, to help him to this goal.

It was not until the time of Rene Descartes that this unified picture of man and the world was destroyed. From the time that Descartes rejected knowledge by immediate experience, modern

\(^1\) Mortimer J. Adler, *What Man Has Made of Man* (New York, 1938), p. 194 n. 38a
philosophy and psychology were forced to take an indirect approach to the reality of the outside world. And since our knowledge is an id quod instead of an id quo, according to the Cartesians, the problem arose as to how a totally spiritual entity such as an idea could be caused by the physical object outside. As a result of the above reasoning, there arose in psychology a dichotomy between the spiritual side of man and the material side -- between the mind and the body.²

There followed after this a line of philosophers and psychologists who not only did not bridge the mind-body dichotomy, but made the cleavage wider, even tending to atomize man into his component parts. Thomas Hobbes went back to the ancient Greek philosophers for an answer, reviving the theory of materialistic atomism. The British empiricists followed in chronological order: Locke, Berkeley, and Hume. And in just as strict logical order they hewed away what remained of medieval psychology's whole man. As Adler says: "As a result of the simple error of treating sensations or ideas as that which (id quod) is known instead of as that by which (id quo) man knows what (quid) he knows ... the development of psychological doctrine from Locke to Hume ended in subjectivism, phenomenalism and positivism."³ But it was Hume who finally carried Cartesian psychology to its logical

²Ibid., pp. 68-75; William Turner, History of Philosophy (Boston, 1903), pp. 450-457.
³Adler, p. 77.
destructive conclusions. He reasoned correctly that if we have certitude only of our own subjective modifications, then we have no knowledge of a reality outside of us. Substance, then, does not exist for us, only the accidents which are, for a time constitutive of our mental state. For the Ego itself is nothing else than an accidental grouping ("heap or collection") of sensations. Our ideas are not caused by the outside world because there is no such thing as causality. If there were, we could perceive causal relations in our immediate percept. Therefore, we are nothing but a bundle of sensations accidentally and for a time grouped together. So say Hume and his followers.

Thus fell for good, it seemed, the medieval notion of a unified psychology of man. Unity was yielding place to multiplicity. From the time of Hume forward there was a noted tendency to make psychology elementistic and empirical. 5

The man who contributed perhaps more than anyone else to the progress of elementism and empiricism in psychology was Wilhelm Wundt, the founder of modern experimental psychology. 6 We will

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4 Hume, Inquiry Concerning Human Understanding, Section III.

5 In almost all the physical sciences, physics, chemistry, biology, anatomy, etc., the tendency toward analysis and atomism had already taken hold. For further comments on this tendency in the sciences see Willis D. Ellis, A Source Book of Gestalt Psychology (New York, 1935), p. 2; Kurt Koffka, Principles of Gestalt Psychology (New York, 1935), pp. 5-9.

study here first Wundt's influence in making modern psychology empirical. We will then study his psychological system as such, bringing in his elementism.

In the mid-nineteenth century, the physical sciences were fast becoming the "sacred cow" that we know them as today. The work done in biology, anatomy, physics, and all the other "positive" sciences showed the increasing interest of men in those fields. The works of August Comte gave philosophical sanction to this work; in fact, it elevated the physical sciences to a position above all other sciences, a position they had never enjoyed before. It is no wonder, then, that Wilhelm Wundt, the young student at the Berlin Institute, should be strongly influenced. As with so many other great men, the Zeitgeist was mainly responsible for the choice of his life's work. But in particular, it was the influence of such physicists as Weber, Muller and Helmholtz that made the young Wundt so interested in applying the methods of physiology to psychology.8

In 1873-4 Wundt published his monumental Physiological Psychology, the foundation stone of much of his later work. In this work, Wundt broke with previous tradition in psychological experiments and insisted upon scientific objectivity in every step

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7The word "positive" is used here to connote the type of science Comte was referring to in his work by that name. It is mainly concerned with concrete physical facts rather than theory or abstraction from those facts.

8Adler, p. 84.
of the process. The stimulus was to be objectively knowable and, if possible, measurable. This would give rise, in Wundt's theory, to an objectively knowable and measurable response. As Gardner Murphy says emphasizing Wundt's innovations in the psychology of the times: "In this formulation [see above] Wundt radically broke with the introspective psychologists from Hobbes onward. For no matter how much emphasis had been given to behavior, and to stimuli causing behavior, . . . no one had grasped in its full entirety the scientific implications of stating mental events in relation to objectively knowable and measurable stimuli and reactions."10

Introspection, however, was by no means neglected by Wundt. It was used as a primary tool in all Wundtian experiments. The difference was that now the physiological processes preceding introspection were studied along with their concomitant psychic experience. For a psychic modification was always experienced parallel with the physiological modifications in the sense organs. But there was no causal interaction between the two according to Wundt.11 With this theory, Wundt thought, one could gain knowledge about subjective mental states from a study of excitations in the sense organs and the nervous system, and visa versa. It

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10Ibid.
11Boring, p. 333; Murphy, p. 150.
It is clear, therefore, that Wundt was a psycho-physical parallel-
ist. In this, as in many other of his theories, he has influenced
many modern psychological schools. 12

Wundt's psychological laboratory at Leipzig was the first
of its kind in the world. It was here that Wundt and his fol-
lowers carried on their tremendously productive work in psycho-
logical experimentation. From this laboratory went leading psy-
chologists well indoctrinated in Wundtian physiological psychology.
These men made their mark in universities all over the world. It
would be difficult, therefore, to exaggerate the widespread in-
fluence that Wundt had on modern psychology through the "Institute"
at Leipzig, as he called the laboratory. 13

As to Wundt's elementistic system of psychology, one notes
the same penchant for precision and organization that characterized
his insistence on an objective scientific approach to all of psy-
chology. Wundt's methodology, his genius at organization and
system were, perhaps, his most outstanding contribution to the
infant psychology of his time. 14 However, the content of his

12 Titchener's instructuralism is probable the best example of
this. Titchener took over Wundt's notion of psychophysical parallel-
ism "uncritically," says Heidbreder (see Edna Heidbreder, Seven
Psychologies (New York, 1933), p. 126). We shall see that Gestalt
psychology also came under the Wundtian influence in this as well
as in many other matters.

13 Boring, p. 324.

14 Murphy, p. 155. Murphy says: "He [Wundt] did not occupy
himself greatly with new kinds of experiments. His task was chiefly
the extension and systematization of studies already inaugurated."
system is also important because of the influence it had on other systems of psychology.

As we saw, introspection was of the essence of Wundtian psychology. This is brought out in Wundt's description of the function of psychology.

Psychology has to investigate that which we call internal experience—i.e., our own sensations and feeling, our thought and volition—in contradistinction to the objects of external experience—which form the subject matter of natural science.\^15

Some modern psychologists hold that Wundt even diminished the importance of the physical in his emphasis on the psychic.\^16

But the important thing to note is that everything in Wundt's system was centered around the subjective experience. This experience, arrived at by introspection, was divided into two classes: simple sensations, and feelings. Sensations were ultimate or elementary forms of experience aroused as soon as the incoming impulse of the stimulated sense organ reached the brain. Feelings or feeling qualities are aroused when certain sensations combine in a total experience. These in turn can combine in certain sequences to form emotions.\^17 Later, all these elements are synthesized or laid hold of by the individual to form a clear intro-

\^15Woodworth, p. 24. See also Boring, p. 332.

\^16Boring, p. 333. He says: "In this manner Wundt, for all that he founded 'physiological psychology' and wrote chapters on the nervous system, really went far toward dismissing the body from psychology."

\^17Murphy, pp. 151-152.
perspective conscious state. Wundt called this clear experience apperception. The results of this whole process were then tabulated and categorized by Wundt in somewhat the same fashion as a physical scientist tabulates and categorizes new elements discovered in a laboratory.

One of the most important effects Wundtian psychology had on the succeeding psychologies was to foster the increasing tendency toward analysis and the emphasis of parts over the whole. Structuralism and associationism, two contemporary schools wholly in the Wundtian tradition, are good examples of this tendency. They hold as the object of psychological research the subjective modifications of the experiencing person. Their main principles deal with methods of combining sense elements. However, as Boring says, the successors of Wundt put more emphasis on the mechanical analysis of introspective states than perhaps Wundt would have wished. They also treat sensations, images, and simple feelings as static bits of consciousness instead of "mental processes," as Wundt had called them. All this engendered a false element-

18Ibid., p. 154. Murphy says that Wundt called the process whereby the various elements are combined and related to form a unity, creative synthesis.


20Boring, p. 329. Boring says of the predominant introspectionism of the time: "Until phenomenological observation eventually came into fashion in the laboratory, practically all introspection was analytical; and introspective analysis meant the resolution of experience into compounds of sensations or other elements like them."
ism, one which ultimately would give rise to such reactions as Gestalt psychology and behaviorism. But before treating these latter two schools, we will first glance briefly at structuralism and associationism, the recipients of Wundt's full psychological heritage.

The structuralism of Titchener was the natural immediate off-spring of Wundt's psychology. With a few changes, as we have seen, the structuralists took over Wundt's elementism completely. However, Titchener insisted upon subjective mental states of the experiencing subject as the only real object of psychology. Psychology studies only "experience dependent on an experiencing person," according to Titchener. Common sense itself is attacked by Titchener because, as he says, it makes the subject add elements to the introspective data which are not really present. There was great need, therefore, of the "trained introspectionist" who would be able to give a totally naive description of his subjective states without adding or detracting anything. We will see that the Gestalt psychologists also put emphasis on

21 Ibid., p. 334.
22 Murphy, p. 214. Murphy adds that Titchener also tended to simplify Wundt's system which was, admittedly, quite extensive and complex.
23 Heidbreder, p. 122.
24 Ibid., p. 124.
25 Ibid., p. 128.
subjective states but only as phenomena reflecting objective data, not as purely subjective states. For the Gestalt psychologist phenomena include objects and meaning, whereas "the straight and narrow path of orthodoxy for Wundt and Titchener led only through pure description without interpretation."  

So much for Titchener's structuralism; now to the next heir in Wundt's psychological kingdom. To trace the complete history of associationism, one would have to go back to Aristotle and his basic rules of memory: similarity, contrast, and contiguity. While a complete history from Aristotle down to the present time is not necessary, a brief look at some of the leading associationists is in order. The constant references of the Gestalt psychologists to associationism and their oft-repeated denunciations of the associationists' most sacred principles make it a fair surmise that associationism is the chief opponent of Gestalt psychology. For associationism is the symbol of the spirit of atomism.

David Hartley, the relatively obscure eighteenth century physician, can be called the founder of associationism. Hume, it is true, had seen the necessity of having some laws for the grouping together of sensations and ideas. He had stressed re-

26 Boring, p. 592. Titchener often referred to himself and his followers as "existentialists" because of their strong emphasis on the study of static subjective states. The functionalists, on the other hand, stress operation, adjustment, and adaption as the object of psychological research. See Murphy, p. 214; Woodworth, p. 31.
petition, similarity, and contiguity. However, it was left to Hartley to establish associationism as a working system. Hartley was the first psychologist to do extensive work in the physiological side of mental states. He also laid stress on the rules of contiguity and repetition underlying the association of ideas. 27

The two Mills, James and John Stuart, together with Alexander Bain are responsible for converting associationism into a thoroughly scientific psychology, a purely mechanical principle of the compounding of ideas. 28 It was Bain, however, who really brought the philosophical psychology of associationism to the point where the scientific psychology of Wundt could take over. 29 For Bain represents the culmination of associationism and the beginning of its absorption into physiological psychology. But Bain did not deny that psychology is a science in its own right, a science which still had as its subject matter the phenomena of mental life. He was, as Hartley before him and Wundt after him, a psychophysical parallelist. Thus he saw the necessity

27 Boring, pp. 193-200.

28 Ibid., p. 219. John Stuart Mill even called psychology the science of mental chemistry. It is obvious that the influence of scientism had thoroughly infected associationism.

29 Wundt actually made associationism the basic principle of his elementist psychology. In associationism, Wundt found the fundamental principle of connection between elements. For more on this see: Boring, pp. 219 and 337-338.
of studying the physiological processes as an indication of and aid to the knowledge of mental life. His work on human volition shows that he in no way wanted psychology to be converted into a completely materialistic physiological science.30

Our latter-day associationism stemming from Edward L. Thordike and his followers shows probably the clearest ear-marks of a system which is the child of its philosophical and psychological parentage. It is in the complete tradition of the sensationism springing from British empiricism. At the same time, it is under the strong influence of the movement of scientism. Adding to this latter trend of scientism in associationism is the work of Ivan Pavlov, whose experiments on conditioned reflexes have been thoroughly incorporated in the associationist theory of learning.31

The reason behind the associationists' interest in learning lies in the fact that they are constantly forced to explain why ideas occur in clusters and often in regular sequences as they do. Having rejected the real world, substance, and causality, they must necessarily find some reason for the apparent unity of our sensations. They respond that the clusters and sequences were formed in past experience by the joining of sensations that occurred together or in immediate succession and were contiguous

30 Ibid., pp. 233-240.
31 Woodworth, pp. 56-66.
In space and time. In other words, the sensations occurred together originally, hence they are taken as one group by the percipient.

Such an explanation as this for the process of perception seems to the Gestalt psychologist very "atomistic" and "haphazard" compared with the Gestalt "dynamic whole" process. The Gestalt theorists point out with vehemence that in the associationist grouping of sensations any image could be connected with any other; it is just a matter of chance conjunction. As a typical example of associationist theory of perception, Katz, one of Gestalt's chief exponents, gives the following: "Vanilla Ice Cream = Cold + Sweet + Vanilla Aroma + Softness + Yellow." The purpose of the example is obviously to show the totally piece-meal independent character of the elements in associationist perception. We will see how the Gestalt psychologists form their theory of perception as one diametrically opposed to that of associationism.

What was the outcome, then, of the philosophical and scientific trends that we have seen stem from such philosophers as Descartes and such scientific psychologists as Wundt and his followers? We now have in psychology a picture of man sectioned

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32Woodworth, p. 38.
34Ibid.
off, cut up into the component elements of his subjective sensations. He is no longer a unified entity, a composite of body and soul as psychologists held in the middle ages. Associationism with its artificial rules of sensation tries to staple man together into an accidental bundle of images and ideas. It is a perfect example of what had happened to psychology by the turn of the twentieth century. The parts had taken complete predominance over the whole.

The questions that men began to ask, however, at about this time were indicative of the reaction about to take place. How can a science, they asked, which atomizes man into a mere set of sensations claim to be a true psychology, that is, a science of the whole man? How can such a science of mere stimuli, responses, and sense-bundles explain such an experience as the enjoyment of a work of art, or the sudden discovery of a truth? The unrelated psychic elements and physiological processes that interest the psychologists we have just discussed are so far apart from the real life of man that they seem to belong to a different universe. The strong reaction that consequently took place in psychology at this time took the form of two completely different schools of thought, behaviorism and Gestalt psychology. Behaviorism answered the problem by rejecting the notion that psychology is a science of the whole man; it is only the science

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of man's physical reactions. The Gestaltist tries to give a unified picture of man, especially in his perception.

Behaviorism is a typically American product. It began here and has had its greatest development on American soil. It is specifically a reaction against the "vague" introspectionism of the orthodox psychology of its time. The behaviorist has a simple outlook on life. He asks only for the cold facts of objective behavior as the subject of his psychology. He measures the stimulus and the response of a given organism in a given situation, tabulates his findings and then calls a definite halt to psychological investigation. For the behaviorist does not believe consciousness should come into psychological investigation. The data acquired in his laboratory may get more complex as the stimuli or objective situation become more involved, but it will never be necessary to pass over into another realm of being for an ultimate explanation. The physical measuring apparatus and the mathematical formula are the ultimate explanations.

This "positive" attitude would naturally appeal to the practical minded American. It was, besides, perfectly in line with the functionalism that was sweeping the country at the time.

36 Boring, p. 643.
37 Ibid., pp. 640-644; Murphy, pp. 259-267.
38 Boring, pp. 587 and 621.
It only grew sharper through the opposition that came from the
die-hard followers of Titchener. No wonder, then, that behavior-
ism saw such an immediate growth in America.

On the Continent, too, there was a reactionary movement,
surprisingly different in nature from behaviorism, which was
soon to find its way to this country and prove itself a fit match
for its recalcitrant behaviorist brother.

Gestalt psychology was not a reaction against the introspec-
tive aspect of the psychology of its day, nor did it decry its
scientism. The main contention of the Gestaltist was with the
elementistic or atomistic aspect of that science. Boring sum-
marizes its position in this way:

Orthodox psychology in 1910 was (1) experimental, (ii) in-
trusive, (iii) elementistic and (iv) associationistic. Behaviorism and Gestalt psychology were agreed only on the
first: both schools thought psychology should and could be
experimental. Introspection behaviorism rejected in toto, whereas Gestalt psychology placed great store upon the
phenomenal description of direct experience.39

In general, then, Gestalt psychology is a science which
endeavors to bring unity back into the science of man. It in-
sists, indeed, on the basic unity of man and the universe around
him. According to the Gestaltist, we can only explain the total
sum experience of man by returning to an holistic psychology.
As Kurt Koffka says:

Thus the historian was right when he insisted that . . .,
generally speaking, it would be impossible to incorporate

39Ibid., pp. 642-643.
the data of culture within current psychological systems without destroying the true meaning of culture.

And speaking of the older psychology he says:

The dilemma of psychology, then, was this: on the one hand it was in possession of explanatory principles in the scientific sense, but these principles did not solve the most important problems of psychology, which remained outside its scope; on the other hand, it dealt with these very problems, but without scientific explanatory principles; to understand took the place of to explain. . .

Max Wertheimer sums up the case for Gestalt psychology in this way:

The fundamental "formula" of Gestalt theory might be expressed in this way: 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.

The Gestalt holistic theory of perception, which is the subject of this thesis, is one of Gestalt's most effective arguments in contemporary psychology's pressing issue of unity and multiplicity or, as Gardner Murphy terms it, the "issue of wholes and parts." 43

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41 Ibid., p. 20.
43 Murphy, p. 444.
The purpose of this thesis is to study the theory of perception as proposed by the Gestalt school of psychology and come to some judgment as to the validity of its claim. In this study we will not cover all of Gestalt perception theory but only that proposed by the Berlin School of Gestalt psychology. The main proponents of this school are Drs. Wolfgang Köhler, Kurt Koffka, and Max Wertheimer.

Although Gestalt psychology is chiefly an experimental scientific theory, it is not mainly experimentation that we are interested in here. It is the theory involved in Gestalt sense perception that we will be almost exclusively involved with. For, as Fr. Vincent Herr, S.J., says, "Gestalt psychology is not only an empirical science, it is highly speculative."  

In this thesis the Gestalt view of perception is given exactly as it is proposed by the Gestaltists. I neither add to it nor detract from it in any way until the last chapter on criticism. It should be noted, then, that the first part of this thesis does not necessarily intend to give an objective view of the Gestalt-associationist quarrel. It gives the Gestalt view.

44 Vincent V. Herr, S.J., "Gestalt Psychology, Empirical or Rational," Essays in Modern Scholasticism, Anton C. Pegis ed. (Westminster, 1944), p. 243. Herr says: "Gestalt psychology then, in its entirety, ought not be called empirical, nor even investigative only . . . It is both investigative and speculative to a high degree, with probably much more insistence upon the speculative or philosophical aspects. . . ."
The procedure followed in this thesis is the usual one. A history was first given, the purpose of which was to pose the problem, atomization of knowledge, and point out that by the end of the nineteenth century atomism was the accepted doctrine in most sciences, especially psychology. The second chapter deals with the theory of perception itself, showing the three general environments involved in every perception: the geographical, physiological, and the behavioral. The third chapter deals with the complex theory of isomorphism. It entails the Gestalt application of the concept of structure to the three above-mentioned environments. In the last chapter a study is made of the philosophical implications of the Gestalt theory, and a judgment is then attempted as to the validity of the Gestalt doctrine.

For the purpose of simplification only the two main schools opposing Gestalt psychology are considered here, namely, associationism and behaviorism. I use several different terms to refer to these two schools. Some of these terms are used generically to refer to either school, whereas others refer specifically to one or the other school depending upon the special aspect or doctrine that I am particularly interested in at the time. For instance, the terms "atomist" and "positivist" are generic and refer to the members of either school; whereas when I use the term "elementarist" or "sensationist," I refer to members of the associationist school; and when I use the term "mechanist," I mean it more properly to refer to a member of the behaviorist school.
CHAPTER II

GESTALT PERCEPTION

The first chapter has given, at least in outline form, the picture of psychology as it looked to the observer around the end of the nineteenth century. It was a psychology thoroughly imbued with two main ideas: the necessity of a scientific approach to psychology and the atomization of the picture of man to its smallest constituents. Although the Gestalt psychologists were strongly opposed to atomization, they took up the scientific approach enthusiastically. As we shall see, they combined the scientific approach with that of the phenomenological method in their experiments on sensations.

In this chapter, then we will first of all study the application of the phenomenological method to Gestalt psychology of perception. We will then analyze the data given us in the phenomenon. Finally, we will note briefly the other two areas involved in each perception, namely, the geographical and physiological environments. And we will, besides, take note of the causal relationship each environment has with the other. The

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experiments and examples used here mostly concern visual perception rather than that of any of the other senses. This approach was chosen following the precedent of the Gestaltists themselves the great majority of whose experiments deal with visual perception. However, what is said of visual perception can be applied to the perception of any of the other senses since the principles involved are the same.

With the advent of the scientific approach in all branches of learning at the end of the nineteenth century men began to demand: "Give us facts only. Away with the vague philosophical generalizations of times past. The purpose of science is to give facts only. All generalizations on those facts and relations between them are useless and tautological."\(^2\) In opposition to this narrow outlook several systems arose demanding emphasis on subjective evaluation to go along with the "facts."\(^3\) Among the latter were the Gestalt theorists, who said that mere facts are


useless if there is no theory to go along with them. It is im-
possible ever to attain facts only because they are always colored
with our subjective understanding of them. It is only in the
discovery of the relationships between facts and their causal
connections with each other that we attain to true scientific
research. The emphasis was shifting from the mere fact to the
subjective concept we have of the fact. In giving a naive and
accurate account of these subjective data, the Gestaltists felt
that they were coming as close to the reality of things as it
was possible for the human mind. After all, they reasoned, we
are only certain of our direct internal experience. Man has
no direct access to the physical world," says Köhler. "The pheno-
menal world contains all the material which is directly given
him." Therefore, if the Gestalt psychologists were to prove
that reality exists as a whole, the best way to start is to in-
spect our subjective picture, our direct experience.

It is primarily for this reason that the Gestalt psycholo-
gists put so much emphasis on the phenomenological approach in
psychology. For them it is necessary to give a straightforward,
descriptive account of consciousness; the phenomenon is supposed
to "speak for itself," as it were. As Koffka says: "For us

5Ibid., p. 65. Köhler here is being quoted by Koffka.
6Köhler, Value in World of Facts, p. 143.
phenomenology means as naive and full a description of the direct experience as possible." Many errors are ferreted out when the subjective data are so thoroughly scrutinized as it is with this method. Many times theories are wrong or contain some error because of undue haste on the part of the one making the judgment. Our perceptions themselves are often at fault without our knowing it. For these reasons, the Gestalt school found it necessary to apply phenomenology to every aspect of its psychology. We will see it applied in the perception of causal relations in the theory of isomorphism, but this is only part of its scope in Gestalt psychological theory. Kohler goes so far as to say: "Phenomenology is the field in which all concepts find their final justification." Katz adds that the comprehension of contemporary psychology "necessitates an understanding of the phenomenological method." Finally, it is expected that the proper application of this methodological science will answer one of the main problems facing the Gestaltists at the present time, that of the ultimate principles underlying

8 Koffka, The Principles . . . , p. 73.
9 Katz, p. 18. Katz discusses here what the Gestaltists call the "stimulus error," a matter often brought up by them in connection with perception. It is defined as: "... that which makes us attribute to a thing [i.e. a perception] elements which should not be in it."
10 Kohler, Value in World of Facts, p. 102.
11 Katz, p. 18.
their theories.12

Let us now take an example of a perception in which the phenomenological method is used. Later we will verify our phenomenological data by means of experiments.

Let the reader imagine that he is seated at his desk. There are several articles before him, for example, a typewriter, an inkwell, some books, and a pencil. These articles are strewn about in some disorder. We examine this percept, asking ourselves how the objects in front of us appear. Do we have the impression that all in front of us forms one large object? Do we have the impression that there is a group of stimuli spread out in front of us at random with no unity at all? No, the impression we get is nothing like the ones mentioned above. Examining such a percept we find that we attribute an independent entity to certain stimuli or groups of stimuli; we divide off the field of perception into parts, as it were. The typewriter is one entity, the inkwell another, and so forth. Why do we do this? The layman might consider this last question superfluous, in fact, silly. Actually the question is an important one, especially to the modern psychologist. For, what reason can the atomist give for the phenomenon we have of certain definite in-

12Kohler, Value in World of Facts, vii. He says: "never, I believe, shall we be able to solve any problems of ultimate principle until we go back to the sources of our concepts, in other words, until we use the phenomenological method..."
dependent entities, divided off as they are from others? If reality is nothing but the reception of disparate stimuli, why the separate entities?

The problem can be restated in another way. Why is it that the pile of books appears to the observer as a collection of separate things? Since the typewriter partially obscures the inkwell, why are these objects not seen as one unit? The atomist might answer that we see these objects as separate entities simply because we have had previous experience of them as such. Thus we are able to recognize them even if some of their dimensions are obscured by other objects. In answer to this the Gestaltists reply that experience, while important in perception, by no means plays the major role in the formation of objects into separate beings. For the question still remains, how did we form the very first concept of this object which we now see as a unit? Gestalt psychology holds that the tendency to form ob-

13The Gestalt concepts of the "total visual field" as opposed to the "natural subdivisions" of that field come into play here. The distinction between the two is an important one. We do not deny that the Gestaltists hold that every percept is a whole in a sense. This whole picture of the given is called by them the "total visual field." However, they do not deny that in each "total visual field" we divide off certain objects as independent entities in themselves. These subdivisions are simply called by the Gestaltists "natural subdivisions" in the "total visual field." See Kohler, "Some Gestalt Problems," as summarized in Ellis, A Source Book of Gestalt Psychology, pp. 56-57.

14Katz, pp. 20-21. Nearly all of the foregoing phenomenological analysis is contained in this section of Katz.
jects as wholes becomes operative in the consciousness of a child from the start, even without experience of any sort. This is equally true of a person born blind.

One method of verification to support this viewpoint can be found in the comprehension of previously unknown objects. In this, "we often comprehend objects as units before we have any way of knowing what they are like. This applies to vision in comparative darkness. It occurs in strange surroundings when we come upon objects we have never before seen." We even have the tendency to construct wholes when they are not completely given as such.

All the foregoing discussion has proven one thing, according to Gestalt psychology, namely, that by the use of the phen-

15Ibid., p. 22. See also Kurt Koffka, The Growth of the Mind (New York, 1931), pp. 352-362. In this very analytic treatment of the first concepts of the child Koffka says: "If the question is asked how the first perception of thing arises in the child, we may answer negatively that it would be wrong to suppose that the 'thing' is nothing but a mere connection of various visual, gustatory, and auditory attributes resulting from frequent repetition.

"[T]he world as it appears to the infant is already formed." pp.352 and 354.

16Katz, p. 22.

17We find this statement verified by Gestalt's important Principle of Pragnanz. This principle states that: "Psychological organization will always be as good as the controlling circumstances permit." It is the subject of many Gestalt experiments. For further information see Koffka, The Principles... p. 110. We will study the Pregnancy Principle more thoroughly in Chapter 4 of this thesis.
omenological method we find that perception is holistic and not an "and-summation" of sense elements. It is impossible for the mechanistic theory to explain these phenomenological facts. If perception is a mere reception by the organism of unrelated stimuli, why do we find separate independent entities in our phenomenological analysis? The ordinary mechanistic answer to this query is that there is some fixed mechanical device which accounts for the organization of stimuli into certain definite groups or entities. Köhler answers by saying that if this is true: "It should follow that the mechanically fixed elementary regions and functional boundaries by which order is achieved would somehow be detected in phenomenal experience." 19

One might tend to think that this notion of totality in phenomenal perception is grossly over-emphasized by the Gestalt school. The fact is, however, that the Gestaltists consider it a very important point supporting their general theory of perception. As Köhler says: "In my own opinion one cannot grasp the position of the Gestalt theory until one has learned to wonder about the fact of concrete articulations in the visual

18 This is the usual translation of Wertheimer's oft-repeated und-verbindungen, a word meaning literally and-relations or connections. By it he wishes to signify the haphazard grouping of sense elements, without interrelation and without organization, to which the elementalist school is committed in its theory of sense perception. See esp. Max Wertheimer, "The General Theoretical Situation." as summarized in Ellis, pp. 12-16.

After looking at the argument from the phenomenological method, we will now inspect three empirical facts used to prove that our perception gives us a unified totality. However, since this thesis is mainly concerned with Gestalt theory, we will not stress the experimental data.

In Figure 1 we see a set of vertical lines followed by a group of dots in the same order. The lines closest to each other are seen in pairs or stripes in between which are larger spaces. The dots perceived closest to each other are grouped into rows which are separated by larger spaces again. This simple experiment exemplifies the "law of proximity" of Gestalt, which states: "Other things being equal, in a total stimulus situation those elements which are closest to each other tend to form groups." The inference is obvious: how explain this grouping of certain stimuli into certain totals or independent entities? If, as the atomists say, perception is a mere stimulus-response process, why do we find in the response something added to the mere stimuli, namely, the entitative grouping? The Gestalt law of proximity gives the answer. We will see a further...

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20 Ibid., p. 57.
21 See p. 29 of this thesis for FIGURE 1.
23 It should not be supposed that the laws of proximity, similarity, etc. give any ultimate criterion of oneness. They
discussion of other Gestalt laws in the fourth chapter of this thesis.

We will now take up Christian von Ehrenfels' two criteria of form. These two experiments are important to Gestalt psychology not only because they were among the very first experiments performed and gave Gestalt psychology its start, but also because they are used as basic experiments in all Gestalt fields. We will see them applied to the theory of isomorphism in Chapter 3.

Ehrenfels' first criterion was simply applied. Working on different musical melodies, he pointed out that a tune cannot be comprehended as a mere sum of its constituent notes, but it must possess a higher quality which he called the "form quality."²⁴

²⁴See Katz, p. 35, for much of what is said here concerning the von Ehrenfels' experiment.
In this experiment, a melody is played to the subjects several times until they become acquainted with it. Then, a while later, the same melody is played in a different key. It is only the trained musician who can pick out that there is any difference between the first and the second playing of the melody—even though they are played in totally different keys. Now, obviously, the physical stimuli are not the same in these two cases. Looked at from its physical aspect, as the behaviorists do, the frequency of the wave lengths of the notes of the two melodies is completely different. The one played in a lower key is composed of waves of a lower frequency. Therefore, the physical stimulus is not the same in the two experiments. Yet, the subjects report the same sensation. They do not notice a change when the keys of the two pieces are changed. This reaction is untenable on behavioristic grounds. The behaviorists hold that for every stimulus there is a corresponding response. This stimulus-response relationship is supposed to follow with mechanical consistency and accuracy. The followers of Watson supposedly verify this theory by showing that with different stimuli you get a different response. For instance, the stimulus could be a stick of candy dangling in front of a baby; the response is the baby's taking the candy. The only answer that can be given by them to the

von Ehrenfels' experiment is that there is some quality in both sets of responses which is the same. The Gestaltists agree. This quality von Ehrenfels called the form-quality or the "Gestalt-qualität." 26

The second criterion of von Ehrenfels is that of transposability. The individual elements of the organized structure can be shifted but the relation between the parts remains the same. A melody, for instance, can be played in a totally different key but the parts of the new melody so arrange themselves that the same relationship between them remains, the form-quality remains the same. The argument which we presented for the first criterion can be applied for the second.

These experiments, while concerned with different aspects of a subjective phenomenon, definitely have one thing in common. The stimuli in each case are varied in different ways and yet the same holistic sensation remains.

The next experiment that we will take to show, again, the structural nature of our percept is that of Wertheimer's phi-phenomenon. 27 In this familiar experiment the subject sees what

26 Woodworth, pp. 125-126.
27 With this experiment we get into the field of experimentation in ambiguous figures and illusions that the Gestalt psychologists are so interested in. These experiments were a knotty problem for the older psychology to explain because of its necessary commitment to the atomistic explanation. The Gestalt theorists seem to have an argument when they say that such illusory phenomena can only be explained from the holistic viewpoint.
appears to be an object in motion whereas in reality there is no movement present. Two visual elements (pictures, neon lights, etc.) located in near proximity to each other are flashed successively in front of the observer. The result, as it seems to the observer, is that there is only one object, and that object is in motion. The inference of the experiment is obvious. The physical stimuli are plural and they are static. The sensation is of a single object in motion. If, as the behaviorists say, to every stimulus there is a corresponding and adequate response and that this process takes place with absolute mechanical precision, then how explain the above described sensation? In the experiment the stimuli are varied in every way and yet the same holistic sensation is recorded.

We have seen only a small portion of the experiments the Gestaltists conduct in the field of perception. However they all tend to show the same results, namely, as Katz says: "that all objects appear as closed units originally, without experience." These experiments, while having as their direct purpose to prove the Gestalt thesis, also cast very serious reflections on the basic tenets of the behaviorist and associationist theories.

Someone might object that the experimentations on ambiguous

28 Katz, p. 34 gives a good account of the phi-phenomenon.
29 Katz, p. 23.
and illusory figures have no validity because the stimuli used are such as to "deceive" the sense faculties. It is true that in such experiments the subject is "deceived" as to what is really happening in the objective stimuli outside. We saw in Wertheimer's experiment that there are many static stimuli so juxtaposed and flashed in front of the observer that he thinks he sees only one moving object. The Gestaltists admit that there is a "deception" in this matter. But the particular experiments we are concerned with now are not meant to prove anything about the real order. They are meant to show that our sense percepts are so made that they tend to form concrete articulations of phenomena, they "want", as it were to see things as a totality. The laws of the mind demand this. The concern here is with the phenomenal order and the laws governing that order. We will see later how the Gestalt psychologists incorporate their theory of reality with their perceptual theories.

By now it should be clear to the reader that the Gestalt picture of perception is not just divergent from the atomistic picture predominant at the end of the nineteenth century. The

30. We will not here go into the question whether it is the senses that are deceived, as the Gestalt psychologists hold, or whether it is a wrong judgment on the part of the subject which is necessarily for error.

31. We will not deal with the application of the Gestalt concept of form as applied to the real order until the next chapter, which concerns the perceptual theory of isomorphism. In this chapter we wish to show only that the phenomenal order is structured.
Gestalt picture is diametrically opposed to it. It gives just the opposite view to that of atomism. For the old psychology held that perception is an and-summation of individual isolated sensations, a piecemeal aggregate of stimuli, as Wertheimer called it.\(^{32}\)

In their [the mechanists] aim to get at the elements of thinking they cut to pieces living thinking processes, deal with them blind to structure, assuming that the process is an aggregate, a sum of those elements. In dealing with processes of our type they can do nothing but dissect them, and thus show a dead picture stripped of all that is alive in them.\(^{33}\)

Perceptions, say the opposition, are formed as a house is built—brick by brick. The individual receives sense impressions from many different stimulations; he builds-up the disparate stimuli into a meaningful percept somehow or other. For instance, light waves hitting the retina in several different places at different frequencies, etc., leave different stimuli in various localities. The observer might receive such different visual sensations, then, as "red," "green," "blue." He might have the auditory sensation of the sound of a train whistle going from a higher to a lower pitch. He might have the tactual sensation of a strong breeze against him and a rumbling underneath his feet. The sum of these sensations is perceived by the observer as that of a train with various colored cars going by at a fast rate. The observer built

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up the unrelated group of sensations, as it were, until they became a unified single impression. This is called a process of sensation "from down-up"; that is, from many disparate elements one sensation results. But how the individual is able to get such a unified sensation; why he chooses some stimuli and not others; and what laws govern his actions throughout the perception are questions which do not seem adequately answered by the mechanists.

The Gestalt psychologist, on the other hand, say that the sensation follows an opposite course. The subject first of all has the percept of a total structure. He understands the percept in that light. When he sees, for instance, a variously colored train in motion, he does not think he is first seeing: "red," "green," "blue"; feeling: "breeze," "rumbling underneath feet," etc. He thinks of the object as "something" which is colored, moving, etc. By analysis he is able to break-down this whole percept into its stimulus elements. The Gestalt process is "from up-downward," not vice versa.

Scientific analysis, then, is not against the Gestalt tenets. But the parts are only known after we experience the sensation as a whole, not before. After the sensation is formed, it is analyzed to discover its different elements.

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34 Ellis, p. 15; Petermann, 26; Woodworth, pp. 121-122.
35 Ellis, p. 15.
36 The Gestaltists have often been criticized for abandoning
So far we have covered two main points in our treatment of perception according to Gestalt psychology. First of all we saw that the phenomenological method reveals whole structures in perception. We then further verified this with three famous experiments. We will now analyze the process of perception itself into its various parts to discover the main steps involved in the typical holistic sensation. In this analysis we again follow the Gestalt method; we break-down the process of sensation into its parts. We will first take the object of sensation, then the subject. Then we will see how the latter is further analyzed into its component psychophysical elements.

Almost all philosophical systems admit that in every perception there is a subject-object relationship. The sensation starts with something "outside," it is said, and this objective element affects the subject in some way; there is a relationship of *actio-passio*. Whether this object is really distinct from the subject perceiving or not is a matter of contention among the different systems. The fact is that there is a subject-object relationship of some sort. The Gestaltists also hold to such a realtionship. They call the objective, external stimulus the "geographical the analytic method, that method which has proven so productive both in science and psychology alike. Gestalt psychology denies that it has done this. It states that analysis is fine in its proper place, i.e., after sensations are formed. According to Katz, (p. 163) "[T]here is no need to abandon the analytic method employed by the older psychology in its study of perception. The method remains valuable even if many of its findings should be regarded in a new light because of Gestalt theory."
environment." This environment is where the sensation begins, or, more exactly, whence the sensation begins. It is the physical world around us and it follows the laws of the physical world, physics. Within this geographical environment itself the Gestalt psychologists distinguish two types of being or, referring to perception, stimuli. The two stimuli are: the "distant" stimulus, and the "proximate" stimulus. The distant stimulus is the stimulus as it arrives at our sense organs after it has been affected by the media. We will see more of these terms in a later chapter.

The causal connection between the object, the geographical environment, and the subject is important for Gestalt. According to these psychologists this environment has a direct causality on the subject experiencing. It is this causal action of the geographical environment which explains, according to the Gestaltists, the existence of the sensation.

Here we see another example of Gestalt as a reactionary

37 Koffka, The Principles... pp. 27-28. The word "environment" means for the Gestaltist: "... a definite number of separate objects and events, which, as separate objects and events, are products of organization." Ibid., p. 67. It is a combination of all the circumstances affecting sensation.

37a Koffka, The Principles... pp. 78-80.

38 Cause for the Gestaltist means pretty much the same as it does for the scholastic. Koffka, (The Principles... p. 378) describes it as the "imparting" of force or movement from one body to another.

school. For it rejects Hume's ideas on causality entirely. Most, if not all, of the other modern schools of psychology accept the Humean denial of causality. They affirm with him that causality is a mere temporal sequence of events. 40 A. Michotte has recently conducted experimental work in the field of causality proving the Gestalt thesis on this subject, namely, that causality can be perceived in sensation. 41 Applying the phenomenological method to experimental perceptual situations, he concludes that the experience of causality is a primary phenomenon.

Kurt Koffka, one of the leading Gestalt theorists, summarizes the Gestalt position on causality as follows:

But since Hume we have been taught that the naive person is mistaken [in thinking that he sees the process of causation]; that he could not possibly see such transference of motion or force, because in the stimulating conditions, in the light waves, there is nothing that could produce such a perception... It [Hume's position] is one of the cornerstones of the positivist attitude towards science which we have had so many occasions to attack. But its strength and unassailability... are only apparent.

Must we not say instead that as some spatial stimulus distributions produce various shapes, and some spatio-temporal ones the experience of motion, so will others arouse the perception of force and causation? 42

And again:

A causal connection is not a mere factual sequence to be memorized like the connection between a name and a tele-

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40 See Chapter I of this thesis.

41 A. Michotte, La Perception de la Causalite (Louvain, 1946).

phone number, but is intelligible. 43

The next step in our analysis of perception takes us within the subject himself. It is the mediating step between the geographical environment and the finished perception. We will call it the physiological environment. 44 It is this physiological environment which, as we saw, is in direct causal connection with the geographical. The physiological environment is an unconscious process. 45 It is a combination of the physiological processes which enter into the formation of the percept and mediate between the geographical environment and the final conscious or perfected sensation. It is mainly the office of mediator, however, that the physiological environment fulfills. 46 In its capacity as mediator it acts according to definite rules which we will discuss in the fourth chapter. Here, we will simply point out the existence of this second step in perception. In regard to this environ-

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43 Ibid., 20

44 The Gestaltists use the terms "physical processes," "physical organism," "real organism," etc. to refer to that part of sensation in which the body is involved. It is the part of the sensation between the external sense organ and the actual consciousness. For matters of simplification and clarity, however, we will refer to this as the physiological environment. The word "behavioral" or phenomenal," then, refers to the psychic environment, the word geographical to the extra-organismal environment, and the word physiological to the intermediate, nervous system.


46 Ibid., p. 61. Koffka says: "Between these two worlds, i.e. the behavioral and geographical, and mediating between them are the physiological processes within the organism."
ment Koffka quotes Köhler as follows: "... there is no reason at all why construction of physiological processes directly underlying experience should be impossible, if experience allows us the construction of a physical world outside which is related to it much less intimately."

When the Gestalt psychologists speak of the "dynamic unifying activity of the subject" in the sensation, they are referring mainly to the working of this physiological environment. For it plays a very dynamic role in the process of sensation. This environment works unconsciously on the sense data and gives it subjective articulation and organization. Katz adds to this:

Two varieties of factors constantly determine the course of physical processes. In the first category are forces at work in the process itself; they represent its dynamic aspect. In the second category are those characteristics of the systems concerned which may be regarded as constant conditions for the particular process taking place.

Spontaneous self-structuring occurs in a psychophysical field just as it does in a physical field.

The physiological explanation behind the Pregnancy Law shows the underlying dynamic activity of the organism during the formation of a percept. Therefore, since this notion of dynamic acti-

47 Ibid., 62.
48 Köhler, "Some Gestalt Problems," as summarized by Ellis, pp. 61-64; Petermann, p. 113. Here Petermann gives a criticism of this reasoning.
49 Katz, p. 52.
50 Ibid., p. 49.
vity is so important to the Gestaltists and since we are now discussing the physiological environment, we will go into the matter a bit further. We saw above that the law of pregnancy states that our psychological organization must be "as good as the controlling circumstances permit."\(^5^1\) In this form the law seems anything but definite. However, Katz clears up some of the obscurity by explaining: "It should be emphasized that 'good' refers to such characteristics as regularity, symmetry, inclusiveness, unity, harmony, maximal simplicity and conciseness."\(^5^2\) A good example of the workings of the pregnancy law can be seen in the example of the circle with a small gap in its circumference. The observer tends to see this figure as perfectly symmetrical even though it actually is not.\(^5^3\) Now physiologically we can explain this law in this way. During the formation of the percept, the whole nervous systems undergoes adjustment to the new stimulus situation. The full explanation of this neural activity is a very complicated one; therefore it would be best to take it completely in the following chapter. In this chapter we will just take note of certain overt bodily reactions such as those we come upon in every day life.

\(^5^1\)Ibid., p. 40.

\(^5^2\)Ibid.

\(^5^3\)The law of pragnanz is very important to the Gestalt concept. Katz says (p. 40): "Gestalt psychology considers the pregnancy concept to be of the greatest significance. It is universal. It operates in every individual regardless of experience. In more specific terms it means that the organism has a tendency toward certain modes of behavior, whether they are perceptions, movements, or attitudes."
The activity of the lens of the human eye is a good example from every day experience. By expanding and contracting this visual mechanism can be seen to adjust itself to light intensity so that the clearest possible image falls on the retina. Or, if one is dealing with an auditory sensation, the head adjusts itself toward the source of sound for better hearing.

Another good experimental indication of dynamic activity in the physiological environment is found in the body's reaction to ambiguous figures. In such figures either one of two images can be seen by the observer. Take the familiar example in which one can see either a chalice in white against a black background or two profiles in black facing each other and silhouetted against a white ground. Both images cannot be seen simultaneously. In this case, if the subject looks at the figure long enough, he will notice that his percept changes back and forth from one image to the other. The subject does not choose which figure will occupy his attention at any one time. The attention on one figure rather than another is simply a spontaneous operation. The obvious conclusion is that if there were no dynamic activity going on, there would be no shifting of percepts. These and other experiential phenomena show that the physical processes are not static to the reception of stimulus in perception, but dynamic.

We now come to the final step in sensation. According to Gestalt theory this is the behavioral environment. It is the point

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54 Katz, p. 47
in perception where consciousness begins. Koffka makes this clear when he says:

If we are forced to introduce the concept of consciousness, we have to accept it, whether we like it or not. But it is important to note that the word consciousness does not change the meaning of our own term behavioural environment. If anyone wants to speak of the animal's consciousness instead, he must apply this word to those objects which we call behavioural environment.  

The behavioral environment, then, is the subjective aspect of reality as opposed to the objective aspect presented by the geographical and physiological environments respectively. But both of the latter two environments are inferior or subordinate to the behavioral in the eyes of the Gestaltists. According to them the behavioral environment is the "higher mental process," the realm of mind. Koffka remarks:

Looking at the sciences of Nature, Life, and Mind, we may extract from each one specific and particularly important concept, viz., from the first: quantity, from the second: order, and from the third: meaning or significance (in German: Sinn). Our psychology, then must have place for all of these.

Thus consciousness or the behavioral environment is the result of the structuring process that went on unconsciously in the phy-

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56 *Ibid.*, p. 33: "... we see that our difference between the geographical and behavioral environment coincides with the difference between things as they 'really' are and things as they look to us, between reality and appearance."


siological environment. It is this finished product of perception that is the object of phenomenological research.

The Gestaltists make an important distinction between the causality exerted by the geographical environment upon the physiological and the relation between the physiological environment and the behavioral. In the former there is a direct causal connection, as we saw. In the latter there is none. Koffka intimates this in two or three statements he makes about the relationship between the two fields: "True enough, this conscious side of the processes does not enter into our causal explanations, but it has to be recognized as a fact nevertheless." He continues: "And that leads to the conclusion that it is of the warp and woof of certain events that they 'reveal themselves,' that they are accompanied by consciousness." The physiological environment, then, is the necessary concomitant, the conditio sine qua non, of the behavioral environment. It is not the direct cause of the behavioral environment.

To summarize, then, the Gestalt picture of perception delineated so far, we see a thorough system progressing from the phenomena of direct experience to phenomenological analysis and, finally, verification of the phenomenal data by experimentation.

59 See p. 40, note 45 of this thesis.

60 Koffka, The Principles . . ., p. 73.

61 Ibid., p. 65. See also p. 47.
The result of this phenomenological research and experimentation is a well supported proof of the Gestalt theory of phenomenal perception: "that all objects appear as closed units originally, without experience." 62

The process of getting the percept is analyzed by the Gestaltists into three distinct steps called environments: the objective reality of the outside world which has a direct causal effect on the subject, called the geographical environment; the physiological processes of the subject's organism, called the physiological environment; and the phenomenal world of immediate consciousness, which is not causally related to the other environments, called the behavioral environment.

While, as we shall see, this system has its flaws, it cannot be denied that it poses serious problems to any mechanistic or atomistic system of psychology. To the Gestaltists, the older psychology with its atomized independent elements is static and wooden, totally incapable of being a real science of man. If atomistic psychology is to hold to any meaningfulness at all, say the Gestalt psychologists, it must come around to the admission of some structurlization of the perceptual field. As Katz says "Meaning . . . is internal form arrangement. . . . The Gestalt view is that anything which is not a form, but which can be thought of as simply connected by 'and', is devoid of meaning." 63

62 Katz, p. 23.
63 Ibid., p. 85.
CHAPTER III

THE THEORY OF ISOMORPHISM

Thus far we have seen the Gestalt theory of perception as it is phenomenologically ascertained and analyzed. We saw that in the phenomenal or behavioral sphere at least the Gestalt theory of perception has been established, according to the Gestaltists, by the phenomenological method. The conclusion drawn by Gestalt psychology is that phenomenal data actually presents itself to our consciousness as structured or Gestated. But this is not the complete picture of perception. The question still remains as to how this structured whole of which we are conscious came about. What of the other two environments mentioned? Are they also Gestalten? If so, the Gestalt theory of perception can be said to stand on firm ground; if not, the whole theory could be rendered useless. For it is true that the argumentation from the phenomenological method is valid, but it is valid only in the phenomenal or behavioral order. It is not valid for the other two environments entering into perception, namely, the geographical and the physiological. The question, then, is how to extend the Gestalt concept as to include all the environmental factors entering into perception. The answer to this question, say the
Gestaltists, is to be found in the theory of isomorphism.

Actually, the atomists forced the Gestaltists to initiate their theory of isomorphism. For atomistic psychology never tires of insisting upon the molecular aspect of such sciences as physics and biology. According to them the whole world, both organic and inorganic, is made up of minute sub-microscopic entities called molecules, atoms, electrons, etc. In fact, say the atomists, the more the physical sciences develop, the more minute become the entities which are supposed to compose our real world. Such minute entities are completely invisible to the eyes of man. How is it possible, then, they ask, that we could see "wholes" in our perception? The writings of many physical scientists and theorists show that the atomistic psychologists had good authorities behind them.¹

It was obvious to the Gestalt psychologists that their theory of perception could never be established until such objections as those above were answered. Hence, they set about applying the "structural whole" concept to the geographical and physiological environments. For these two environments are both in the realm of the physical sciences.

To appreciate the value of isomorphism, then, we will use the following method of exposition. We will first get a brief conspectus of the theory as a whole from one of the leading con-

¹Köhler, Value in the World of Facts, pp. 169 ff; Koffka, The Principles... p. 6
temporary exponents of Gestalt psychology. After this we will see the theory in its historical setting, going back to the theory's first beginnings. Köhler's systematic application of the Gestalt concept to the geographical environment will then be shown. Finally we will see how the Gestaltists applied this same concept to the physiological environment. In following this procedure we are actually studying the theory of isomorphism as it was genetically developed by the Gestaltists themselves.

A general conspectus of the theory of isomorphism could be stated as follows. The theory states that not only are our subjective percepts organized wholes, but the physical reality outside of us which causes these percepts is also a structured whole. Besides this, the physiological environment underlying the subjective percept is holistic. There is a like form\(^2\) in all three environments. Katz states the theory in general as follows:

"The theory of physical forms maintains that there are form-like holistic systems in inorganic nature just as there are in biological organisms."\(^3\) And later on he says:

The essence of isomorphism is that phenomenologically ascertained forms actually correspond to psychophysical forms. Psychophysical forms in the brain are viewed as not essentially different from the physical forms of inorganic nature.\(^4\) The implications of this theory are obvious. If once proven, it

\(^2\)The word "isomorphism" comes, of course, from the two Greek words ἴσος meaning equal or same, and μορφή meaning form.

\(^3\)Katz, p. 54.

\(^4\)Ibid., p. 55.
would greatly undermine atomistic psychology and help to establish Gestalt theory as the basis for much of experimental psychology. But now to the history of this Gestalt theory.

The theory of isomorphism really had its beginnings among the physicists of the nineteenth century. It was J. Clerk Maxwell who introduced the field concept into physics. Maxwell began experiments with electric and electro-magnetic fields, considering as he did pull and pressure as forces applied directly from one point to the next.\(^5\) This field theory in physics was enhanced further in the twentieth century by Einstein's changes in Newton's theory of gravitation. Einstein postulated a field of forces in which each force had a relation of interdependence with the others. Newton's old theory of forces acting at a distance was becoming scientifically passe.\(^6\)

This beginning of a field theory in the physical sciences proved a valuable asset to the Gestalt theorists looking for a rapprochement between the phenomenal world, which they knew to be structured, and the physical. They saw that the "field" referred to by the physicists was nothing but the Gestalt concept applied to a physical setting. An opening had been made for the systematic application of the Gestalt concept to the whole realm of physical sciences.

But for the Gestaltist forming the theory of isomorphism,

\(^{5}\text{Ibid.}, \ p. \ 49.\)
\(^{6}\text{Koffka, The Principles. . . . p. 42.}\)
the biggest bone of contention was the notion that had taken pre-
dominance in the physical sciences in the latter part of the nine-
teenth century. According to this notion, as we saw, physics
is a molecular science. It is a study of the minutest entities,
the size of which was diminishing by the day. The new field
theory had by no means been universally accepted by the scient-
ists. It was clear that it would be no small task for the Ges-
taltists to establish their ideas in the physical sciences. The
man who finally undertook this monumental task was Wolfgang Köh-
ler. We will first take an example or two of Kohler's work in
simple chemical compounds. We will then study his extensive work
in the electro-magnetic field.

Köhler held that physics is pre-eminently a molar rather
than a molecular science. He was convinced that, just as in the
phenomenal world, so in the inorganic (the geographical environ-
ment), a composite is something more than the sum of its individ-
ual parts. To prove this he first performed experiments with
relatively simple composites such as water. Koffka quotes Köh-
ler's hydrogen-oxygen example as follows:

Let us take the simplest example we can find: water is ex-
plained by the atomic theory as a compound of two elements,
hydrogen and oxygen, in such a way that it consists of mole-
cules, each of which is composed of three atoms, two of hy-
drogen and one of oxygen . . . Thus we have H, H₂, H₂O. This
sounds like a straight molecular theory, but it is not any-
thing of the kind. For H, H₂, and H₂O have all different
properties which cannot be derived by adding properties
of H's and O's. And in accordance with that, physics en-
deavours to construct models of atoms and molecules which
are just as different from each other as the actually ob-
served substances. The simple hydrogen atom consists of
one proton and one electron in very definite dynamic relationship expressed in terms of the Rutherford-Bohr theory... A completely new system has been formed... It is wrong to say that this system water consists of two hydrogen atoms and one oxygen atom. For where are they to be found??

Another example of the Gestalt thesis, this time one from an every day life occurrence, is to be found in the patterns produced by liquids by surface tensions. Köhler describes the phenomenon in this way:

If one pours oil into a liquid of equal density, but a kind with which the oil will not mix, surface tensions alter the shape of the boundary lines until the oil floats in the other liquid in the form of a sphere. This occurs because of dynamic processes at the boundary of the two liquids. 8

The idea of molar properties in such sciences as physics and chemistry was beginning to take hold. But there was one area of the physical sciences which Köhler felt would be more susceptible to the Gestalt concept than any other. That was the area of electro-magnetic fields.

For an experimental proof, then, of the theory of structuralization in the geographical environment, Köhler needed definite scientific criteria to apply in the field of electro-magnetism. He found these in von Ehrenfels' two criteria of form, the same criteria that we saw in the last chapter in connection with the phenomenal environment. The criteria can be explained as follows:

(1) physical forms are something more than mere "and-connections."

7Koffka, The Principles... p. 57.
8Katz, p. 58.
Another way of putting this would be: the whole is more than the sum of its individual parts. In the example above of the composite, water, we saw that this is true. The elements that form the composite, water, cannot be found in that composite. There is a real **qualitative difference** between the whole and its parts.

(2) The second criterion states that the physical forms mentioned are transposable. This means that the characteristic structure of a given system is retained even if all the parts are on a completely different plane. Therefore, not only is there a qualitative difference between the whole and the parts, as we saw in the first criterion, but the whole is actually independent of the parts if it fulfills the requirements of the second criterion. ⁹

The experiment most frequently used to show that these criteria can be met in the field of electro-magnetism is the distribution of a given quantity of electricity in an isolated conductor of definite shape. We will first give the general experiment as it is described by Köhler. Then we will apply the two criteria.

Köhler describes the experiment as follows:

If the conductor is supplied at a given instant with an electric charge of any arbitrary distribution and thereafter left alone, there results a spontaneous arrangement of equilibrium distribution. . . . It is therefore correct to designate this distribution the "natural structure" of the charge upon the given conductor.

. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .

It is impossible to decrease, increase, or displace any part of this charge alone; for with any such change there occurs

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⁹Katz, p. 55. See also Petermann, pp. 36-37, for further development of the von Ehrenfels' criteria.
A reaction throughout the entire natural structure...

The application of the first criterion is obvious. For the distribution of electricity in the conductor is not a mere and-connection of parts. It is more than this. It is a close knit physical system the parts of which are all interdependent. There is a definite relationship, a quality of the whole that was not there before. "At no place in the conductor can a quantity of electricity be removed or added without causing a re-distribution of electricity in the entire system," comments Katz. Thus, as Köhler says, there is a real physical pattern present, a structural field, the parts of which react as parts of a whole.

As to the second criterion, transposability, we see that the same phenomenon takes place in the physical world or the geographical environment as took place in the behavioral environment when we applied the experiment of melody. For in the melody

10 Wolfgang Köhler, "Physical Gestalten," as summarized in Ellis, p. 28.

11 Katz, p. 55.

12 Koffka gives another example which perhaps gives a clearer picture. "... two insulated condensers of equal capacity are placed at a great distance from each other in a homogeneous dielectric. I convey to each of them the same amount of electricity E. Then they have an equal charge. But this equality is a purely logical equality. Nothing in the world compels me to compare just these two charges with each other. Physically, there is in this case no dynamic reality of equality. Indeed I can alter the amount of the charge in either of the condensers without thereby affecting the amount on the other. When, however, I join the two condensers by a piece of wire, the equality of their charges has become a physical, dynamic reality." Koffka, The Principles, . . ., p. 59.
experiment we saw that the change in musical key necessitated a real physical change in the sound-wave frequency of each one of the notes. However, the over-all pattern remained the same; the melody was recognized as the same. In the same manner, when the quantity of electricity is changed in the isolated conductor, its characteristic electro-magnetic structure remains the same. Each part keeps its identical relative value and position although the charge throughout is greater. The characteristic structure of the whole seems to be actually independent of the electric charge of its constituent parts. Again commenting on Köhler's experiment, Katz adds: "The characteristic structure of the charge is not altered even if the carrier, whether it be a wire, plate, or other form, is enlarged or made smaller without changing its geometric pattern."13 Köhler finished his description of his experiment with the electric wire conductor with this statement: "In a word the structures of static charges upon conductors of given shape are physical Gestalten."14

We have seen some of the experiments of the Gestaltists, especially Köhler, performed in order to prove that Gestalten actually exist in the geographical environment. But other areas besides the ones we have mentioned were also attacked with the same purpose in mind. As Petermann says:

A large number of other quite similar examples can be ranged

13Katz, p. 55.
14Köhler, "Physical Gestalten," as summarized in Ellis, p. 28.
with this, the electric conductor experiment. Distributions of thermodynamical equilibrium, distributions of thermodynamic energy, distributions of electrical potential in a field, distributions of stationary currents, either of diffusion currents or of electric or hydrodynamic or heat currents; and so on.15

Petermann concludes this section of his book as follows:

All in all, a foundation thus emerges for the thesis that genuine "gestalten" occur in physics. The gestalt category is therefore taken to have been proved to be a conceptual form primary for the sphere of physics as well, and urgently requiring recognition of its singularity.16

Thus far we have seen the application of the Gestalt concept to two environments in perception. In the second chapter we saw its application to the behavioral environment, and in this chapter so far we have seen it applied to the geographical environment. But in order to establish the theory of isomorphism with any degree of certitude, the Gestalt psychologists knew that extensive work in the area of the physiological environment would have to be undertaken. This work was undertaken again mainly by Köhler. Here we will first see the reasoning and theorizing which preceded the actual experimentation in the physiological processes. Then

15Petermann, p. 38.

16Petermann, p. 39. It seems that all the leading Gestalt theorists of the Berlin school are in agreement as to the results of their experimentation in the geographical environment. Speaking of this environment as the "given," M. Wertheimer says: "The given is itself in varying degrees "structured" ("gestaltet"), it consists of more or less definitely structured wholes and whole-processes with their whole-properties and laws, characteristic whole-tendencies and whole-determinations of parts. 'Pieces' almost always appear 'as parts' in whole processes." (See Wertheimer, "The General Theoretical Situation," as summarized in Ellis, p. 14.)
we will take up that experimentation itself.

"Denn was innen, das ist aussen," Köhler often quotes this line from Goethe which expresses, for him, one of the most important principles of Gestalt theory of knowledge. The quotation expresses for Köhler the Gestalt application of the theory of isomorphism to the physiological environment. He means by it, of course, that the form seen in the immediate experience of the phenomenal environment has a form exactly like it in the underlying physiological environment. The "innen" in the quotation refers, then, to the phenomenal environment, and the "aussen" refers not to the geographical but to the physiological environment. Here again, it is the form experienced in the behavioral environment that must be explained and substantiated by the establishment of forms in the physiological environment. In brief, the hypothesis of forms in physiological processes is as follows:

"Our working hypothesis states that the specific arrangement of actual experience is an accurate reproduction of a dynamically functioning arrangement of the corresponding physiological brain processes." 18

The general hypothesis of structured physiological processes paralleling the structures of direct consciousness had first been made by Wertheimer. 19 But it was not until Köhler applied this

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18 Katz, p. 56. In this section, Katz is quoting Köhler.

19 Köhler states this in his article, "Physical Gestalten" as summarized by Ellis, p. 33. See also Petermann, pp. 35 and 39-41 for the same.
general hypothesis to concrete experimentation that it became actually useful.

Köhler approached the problem by reasoning in this manner. We see in our own immediate experience (the behavioral environment) structured wholes, Gestalten. This is a certainty according to all Gestalt reasoning. And now, Köhler continued, we have positive grounds for holding that the total geographical environment is a structured field. The question was, how to apply this same field theory to the physiological environment. Looking for something in common between the geographical and physiological environments, Köhler at once saw the answer to his difficulty. Both the geographical and physiological environments are in the realm of the physical sciences; they are both governed by laws which are basically those of physics and chemistry. But, as has been shown, the geographical environment is itself truly made up of fields of physical forces. Therefore, Köhler concluded, the physiological environment should also come under the field concept.

Petermann gives a good summary of Köhler's reasoning in this matter as follows:

Since it has been shown that there are in point of fact physical gestalten, we may assume that such gestalt processes

20 In the last chapter of this thesis we will see a more thorough treatment of the laws affecting the different environments.

21 Wertheimer was really the first to formulate the physiological-field hypothesis, but it was left to Köhler to transform Wertheimer's general notions into a working hypothesis. See Petermann, p. 39-40.
are also specifically developed in the nervous system. They arise, for example, as configured processes even in the retinal periphery. Hence isolated stimuli upon which the other processes could be built up are no longer present there and they extend from there through the entire "longitudinal section" of the "optic sector" as far as the central zones, in such a manner that the whole optic sector presents a unitary region of excitation which is configured throughout its extent—in the same sense as an electrical field may be said to be so, according to Köhler.22

By this detailed description we can see that Köhler traces the outline of his theory throughout the whole physiological environment from the nervous system to the end organs themselves.

Another reason compelling the Gestalt psychologists to postulate structuralization of the physiological environment was the close causal relationship between the geographical and physiological environments. They argued that environments in such close relationship should necessarily be of the same general structural character. Koffka states their complex reasoning in this way:

Furthermore, if B stands for the behavioural world, G for the geographical, and P for the physiological processes, B — G shows the relationship. Now P is in causal connection with G and in a more direct connection with B; the usual assumption, which we shall prove to be erroneous, was that P and G were in close geometrical correspondence, whereas B and P were totally different. Does not such an assumption make it totally unintelligible that B can give us information about G? For if B is totally unlike P, and P is very much like G, how can B lead to G? If, however B and P are essentially alike, then it only depends upon the G-P relation when and how we can gain knowledge about G from P. And if it is so, then surely observation of B reveals to us properties of P.23

22 Petermann, p. 39.

23 Koffka, The Principles ... , p. 62.
With this reasoning and theorizing as a start, the Gestalt psychologists went to experimentation to verify their theories. Their first step was to show that general anatomy is a molar, not a molecular science.\(^{24}\) The nervous system and the brain were among the first areas to undergo rigorous experimentation. It was discovered that neural activity and brain waves are of the same element as electric impulses in a conductor.\(^{25}\) It was clear then that the same structural patterns which occur in electrically charged conductors would also occur in the nervous system and brain. If so, a field theory of the total nervous system could be established making the anatomy of the nervous system a molar, not a molecular science. For the reactions to stimuli would not then be a mere matter of one nerve or one line of nerves reacting to a stimulus, but each stimulus would create a total chain reaction throughout the whole system and this reaction would finally produce a behavior of the total organism. The mechanical stimulus-response process of segregated sections of the organism would be ruled out.

The big difficulty for the Gestaltists to overcome was whether the individual nerve fibers were insulated from each other or not. If they were insulated, the mechanistic theory would still hold even if the impulses themselves were electric in nature. Koffka puts the question in this way:

\(^{24}\)Ibid., p. 56.

Are the individual nervous structures which anatomy has revealed, completely insulated from each other or not? Only if the answer were affirmative would the traditional theory of a mere additive pattern be possible. As soon as the insulation is found to be incomplete, a theory of molar distribution must take its place. Therefore the anatomical evidence so far adduced is insufficient to support the old theory. . . It is true that the nerve fibres are insulated from each other over long distances, but there are innumerable cross connections which probably connect every nerve cell with every other. . . Physiological processes in extension, then, have not been invented in order to support a particular theory. They are demanded by the anatomical facts themselves.

The results of experimentation were as the Gestaltists had thought, then. Koffka says of experiments conducted on the cortex of a dog's brain:

Two recent investigations from the psychological laboratory of the University of Kansas give direct experimental support to this view i.e. that the nerve fibers are not insulated. They show that the action currents of the dog's cortex which result from localized stimulation are not restricted to small areas of the cortex but form a pattern pervading the whole cortex. . .

By these experiments the Gestaltists seem definitely to have some basis in fact for their claim that the cortex is not completely insulated. But this fact is enough for them, for only if there were perfect insulation would the behaviorist theory hold. 28

However important the above quoted experiments may be to the Gestalt theorists, the real coup de grace for mechanistic theories was performed by K. S. Lashley. In the experiments cited above

27 Ibid., p. 61.
28 Ibid., p. 60.
the Gestaltists showed the electrical nature of neural activity and from this argued to structuralism in the physiological processes. By the experiments of Lashley the Gestalt theories were put into the actual language and context of the physiologist himself.

But let us look at the work of Lashley and judge for ourselves. Lashley began his experimental investigations as a confirmed behaviorist. His intent was to show experimentally that the behaviorists' conditioned response and the reflex arc provided an adequate explanation of the adaptive conduct of organisms. But, as Hartmann says, "[b]arely a decade later, the logic of his own findings had forced him into the opposite [i.e., the Gestalt] camp." 29

The first great experimental discovery was that response to stimulation is not dependent upon certain areas of the cerebral cortex, as all previous theories had held. Hartmann describes the experiments:

By means of a thermocautery, varying amounts and different parts of the cortex in a large group of rats were destroyed and their learning records made after recovery from the operation (10–30 days) compared with those of normal animals in such tasks as maze-running, brightness discrimination, etc. Comparing the records for the two groups according to errors, time, and number of trials. Lashley found that in general the cerebral lesions were attended by an increase in the amount of practice necessary to solve the problems, but that the degree of deterioration in learning ability and retentiveness was proportional to the amount of brain tissue in-

29 G. W. Hartmann, Gestalt Psychology (New York, 1935), p. 54.
jured and independent of the area of the cortex affected.\textsuperscript{30} The mere mechanical explanation of definite local stimulations giving rise to definite local responses—all following with machine-like precision—suffered great damage by this experiment.

After this first break with orthodox behaviorism, Lashley went on to develop and reintegrate his findings. The further he progresses the closer he seems to come to the Gestalt camp. He even begins to use Gestalt terminology, such as the oft-repeated word "pattern." For instance, speaking of visual perception, he says:

\begin{quote}
'The response is determined by the proportions of the pattern and within the limits of visual acuity, is independent of the particular cells excited.

The activity of the visual cortex must resemble that of one of the electric signs in which a pattern of letters passes rapidly across a stationary group of lamps. The structural pattern is fixed, but the functional pattern plays over it without limitation to specific elements.'\textsuperscript{31}
\end{quote}

In another place Lashley seems definitely to adopt the Gestalt notions of "pragnanz" and the "dynamic activity" of the physiological environment when he says:

\begin{quote}
'Unity of action seems to be more deeply rooted than even structural organization.

Such phenomena as those observed in animal behavior suggest that the nervous system is capable of self-regulation which gives a coherent logical character to its functioning, no matter how its anatomical constituents may be disturbed.'\textsuperscript{32}
\end{quote}

\textsuperscript{30}\textit{Ibid.}

\textsuperscript{31}\textit{Ibid.}, pp. 56-57.

\textsuperscript{32}\textit{Ibid.}, pp. 58-59.
There is no doubt of the confirmatory character these experiments of Lashley had on the Gestalt physiological hypotheses. The evidence stands on its own feet. The notion that Köhler had first hypothesized with the phrase: "denn was innen, das ist aussen," had now the bulwarks of experimentation for a backing. With this evidence established we can now go on to some of the more minute points involved in the Gestaltists' theories on the physiological environment.

The fact that the nervous system and the cortical sector of the brain are held to be molar structures does not mean that the Gestalt psychologists deny the molecular facts of anatomy. Rather, they make the same distinction here as they do concerning molecular properties in the geographical and behavioral environments. They say, again that although the parts are present, the whole is something over and above—in fact different from—the parts.\(^{33}\)

One of the most important notions stressed in the Gestalt distinction between part and whole is the interdependence of the parts within the whole, the denial that the parts are mere and-summations.\(^{34}\) A discussion of this notion of interdependence of parts and the field that arises consequent to it is in order therefore.

We saw the example of what Koffka calls "real equality" of


\(^{34}\)Ibid., p. 64; Ellis, p. 64.
electric charge in two condensers.35 The charge is equal only when the two condensers are joined by a wire. Then the amount of charge varies in each condenser exactly. If one condenser is altered, the other immediately undergoes a like change. This shows the real dependence one part of the whole system has on the other. The same is true of the current on an electric plate. It spreads itself as equally as possible in all areas of the plate and with each change of charge in one sector, the whole plate undergoes a change.36 Applied to anatomy the concept of interdependence of parts rules out the isolated reaction of a cell or a group of cells. Rather, because of the interdependence of the cells, with each excitation of a cell the whole physiological environment reacts.37 Hence, we can see why the Gestalt psychologists hold that perception is a study of the action and reaction of whole environments and not merely of independent cells. For all the interdependent parts form fields of activity. And these fields, in their interaction upon one another, are the real determinants of behavior.38

The Gestaltists have worked out an elaborate system to show how the field of electric nerve forces in the physiological en-


36Petermann, p. 38.

37Köhler, Value in the World of Facts, pp 201 and 211.

virement actually causes our perceptions. According to their theory, the physiological environment is a static neutral field before sensation, a field of homogeneously charged ions. In this state the environment can be compared to a blackboard before any writing has been put on it. When an excitation disturbs this field there is an instantaneous reaction of ions, taking on the form and intensity of the excitation. The heterogeneously charged ions immediately become distinguished from the rest. This concentration of reacting ions, then, is the figure, and the undisturbed ions are the ground. To express the difference between the two physically, we can say that both the figure and the ground have a different electrostatic potential. Thus the figure to be concentrated upon in perception has a charge which is heterogeneous to its total surrounding area. This makes it stand out firmly against its background. And in our phenomenal environment we have the conscious experience of a certain figure high-lighted against its background.39

We can see from the above that when the Gestalt theorists speak of equality or likeness of form, i.e., isomorphism, they mean just that. For just as the reacting ions on the screen of a television set reflect a real form, so do those of the physiological processes. There is an accurate reproduction in the brain processes of the real object outside. Katz says that "Köhler's

theory of isomorphism goes so far as to conjecture that 'it will be shown that the phenomenal world is literally the expression of circumstances in the brain.'

Does the "like form" mean an exact reproduction of the conscious image in the physical processes? The Gestaltists do not hold that there is exact reproduction. The reproduction is more like a "map" in comparison with the country which it represents. A map is very different from the actual country. However, certain shapes and relations in the map correspond proportionally to those of the country. "What is higher up in the map is farther north in the country. What appears on the map as a wiggly line is present in the country as a river. If we could inspect a person's brain processes as well as we can see a map, ... we could read off his experiences as we read a map."41

These like forms or images in the brain which represent the object are called "cortical correlates"42 of the object. The better the cortical representation is, the better is our perception and the closer we come to perfect knowledge of the outer reality.43 The Gestalt psychologists hold that their theory of

40 Katz, p. 56. Katz is here only extending the already established similarity between the different environments.
41 Woodworth, p. 135.
42 Köhler, Value in the World of Facts, pp. 194 and 218.
isomorphism is a much better explanation of how we get knowledge of reality than that of the mechanists, who offer no reason for our knowledge of things as they are.

To the Gestalt psychologists the value of such a theory as that of isomorphism could be tremendous. It affords knowledge of areas which have always been stumbling blocks to psychologists. For the realm of the physiological processes, especially the brain, has always been a mystery to man.\textsuperscript{44} In the past the methods used by psychologists never seemed adaptable to the unknown areas, but with the theory of isomorphism this difficulty can be obviated. For

Physical forms are obviously approachable by physical methods of investigation. And if the forms of experience correspond to recognizable physical forms in the nervous system, a path is opened to the study of the brain processes concerned. It is an approach which promises far more reliable results than the more or less speculative methods of the older psychology.\textsuperscript{45}

The knowledge gained from investigation of the physiological processes will in turn add to our knowledge of the outside world and the phenomenal world besides. Hence, this new theory and approach has as its purpose an ever widening circle of knowledge about psychological facts. For each new fact learned about one environment gives us added knowledge of the others and \textit{vice versa}. It is hoped that this new dynamic theory will have its effect

\textsuperscript{44}Köhler, \textit{Value in the World of Facts}, p. 207; Koffka, \textit{The Principles}. . . , p. 63.

\textsuperscript{45}Katz, p. 55.
in other sciences besides psychology. Petermann gives us an idea of the scope and depth of this theory when he says:

Thus Köhler's gestalt standpoint here apparently reveals its force in one of the most profound of metaphysical problems. Going by it, he presents in a most consistent form the logical or ontological position of the entire range of all possible problems of wholeness which scientific reflection encounters. The whole extent of these questions—from psychology and physiology to general biology—without exception, in principle fits in with Köhler's idea of the "physical gestalt."

No matter whether, in critically coming to terms with it, one accepts or rejects this theory as it stands, one will not be able entirely to resist the impression that it represents an undeniably imposing body of thinking in natural philosophy.

Isomorphism, then, is a valuable Gestalt hypothesis which is well substantiated by objective evidence. But in spite of all this evidence, the leading Gestaltists still prefer to call it an hypothesis, and they are right in doing so; for it is by no means an established fact. Köhler, however, uses the terms "working hypothesis" in reference to isomorphism; for, as he says, it could be the instrument of much new knowledge. On the other hand, opponents of the Gestalt school often criticise the theory because, as they say, it does not have sufficient experimental proof to support it. To this Köhler answers that such is the case with any hypothesis. Such was true in the case of Ampere's

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47 Petermann, pp. 43-44.
48 See Katz's quote of Köhler, p. 56.
theory of magnetism, the kinetic theory of gases, the electronic
theory, and many others. Some of the assumptions mentioned have
already been verified while others are still in the realm of pure
hypothesis. "But physics and chemistry," says Köhler, "would have
been condemned to a permanent embryonic state had they abstained
from such hypotheses. . ."49

In summary, then, isomorphism is the complex theory (applied
in a threefold area) which completes the Gestalt concept of per-
ception. It attempts to answer the main objections of atomistic
psychology by showing that not only in the phenomenal environment
but also in the geographical and physiological as well there exist
definite wholes. These are the "ultimate" causes for our per-
ceptual sensations of wholeness. This basic theory, in addition,
includes a rejection of the traditionally accepted Humean form
of causality, and it postulates real physical causality between
the object and the subject's physiological processes. Conscious-
ness itself, it is said, is a necessary concomitant of the action
of the physiological processes. The important thing is that each
of the three interacting environments is a structured field with
interrelated parts. Experimental investigations enter into
each phase of the theory of isomorphism for purposes of verifi-
cation.

While it must be admitted that the Gestalt concepts pose
immediate and serious difficulties to any theory of mechanistic

49Koffka, The Principles. . ., p. 64.
atomism, certain questions still remain as to the implications of the Gestalt hypotheses. Furthermore, after ascertaining these implications, we must ask ourselves whether they are consistent with the express doctrines of Gestalt. It will be the burden of the next chapter to answer such questions and evaluate the Gestalt theory in the light of these answers.
CHAPTER IV

IMPLICATIONS AND CRITICISM

In order to arrive at a true knowledge of the implications involved in any theory one should look for an element in that theory which is persistent throughout, something which will be found wherever one studies the theory. Now to the person studying the Gestalt theory of perception one of its most striking characteristics is the presence of laws throughout the whole explanation. Each environmental field entering into sensation has a definite set of laws governing its activity. The Gestaltists often speak of the "inner laws"\(^1\) of the parts and the "inner forces"\(^2\) directed toward a certain goal. And what is the reason for this emphasis on law and order in perception? It is partly because of the Gestalt insistence upon the interrelation between all the parts and the whole, thus rejecting the "haphazard"\(^3\) activity of parts necessarily consequent upon a mechanistic theory of perception.

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\(^1\)Wertheimer, "The General Theoretical Situation," as summarized by Ellis, p. 15.

\(^2\)Köhler, "Some Gestalt Problems," as summarized by Ellis, p. 64.

\(^3\)Ibid., p. 65.
However, another, perhaps more important, reason for the insistence upon laws is Gestalt's commitment to a philosophy of, let us call it, "probability." The Gestalt psychologists do not hold in any way the doctrine of immediate experience, except perhaps the immediate experience anyone would admit of his own subjective modifications. They hold that we have only "indirect" knowledge of the outside world. We do not have a complete knowledge of reality but only "partial" knowledge. Hence, because of this mediate knowledge, we "assume" the existence of real objects. This whole doctrine of "probability" is the natural outcome of the Gestalt theory of perception and sense knowledge. For, as we saw in the second chapter, the subject of Gestalt perception is easily deceived. He is hardly ever in direct contact with the "distant" stimulus, but rather he is directly affected only by the proximate stimulus. But the proximate stimulus has been so influenced by the media that it does not give a true picture of the object. For instance, light coming from the distant stimulus hardly ever arrives directly at the retina of the subject. It is often reflected once, twice, or perhaps several times from other objects. Also, the position of the distant stimulus affects the refraction of light rays and may obscure our knowledge.

5 Ibid., p. 79.
6 Ibid., pp. 79-80.
7 See p. 78 of this thesis for a definition of these terms.
Koffka says:

We cannot expect a very close relationship between behavioural and geographical things. For the light waves do not depend only upon the things qua things, but also upon the nature of the source of light (which only in the case of self-luminous bodies belongs to them as their own property) and on the position of the things with regard to our own bodies.

Then we can say that our question why things look as they do must find its answer not in terms of the distant, but of the proximal stimuli... The danger of this confusion lies in the fact that for each distant stimulus there exists a practically infinite number of proximal stimuli; thus, the "same stimulus" in the distant sense may not be the same stimulus in the proximal sense; as a matter of fact, it very seldom is...

All these reasons tend to convince the Gestalt theorist that the media of perception always obscure the stimuli somewhat. Hence, the Gestalt doctrine of the per se fallibility of sense perception.9

Thus ambiguity of perception is part and parcel of the Gestalt picture of perception. But this poses a serious problem. What basis do Gestaltists have for certitude? How can these psychologists maintain that their theory is tenable at all considering their acceptance of so much obscurity in such an important phase of knowledge as perception? The Gestalt theorists answer such objections by presenting a whole gamut of laws governing perception in all its phases. We will now inspect these laws as

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8Koffka, The Principles... , pp. 79-80.

9Ibid., pp. 78-80. Their opinion on sense deception is one of the reasons why the Gestaltists insist upon their many experimentations with ambiguous figures and optical illusions.
they appear in the geographical, physiological, and behavioral environments respectively, and we will see what implications follow from these laws.

In the geographical environment, as we saw, the proximate stimulus is affected by many factors in the media before reaching the subject of perception. The laws governing this environment are those governing physical bodies themselves. Thus, in visual perception, for instance, the laws of light absorption and reflection come into play. Also, as regards the position of the distant stimulus itself, the laws of perspective are often applicable.10 All such laws are able to be grouped under the general title: laws of physical being.

The laws governing the physiological environment do not differ essentially in type from those above. The nerve impulses and brain waves of the body have the nature of electric waves and impulses.11 Therefore they follow the laws governing electricity in physical bodies in the inorganic world. Such laws as those of Ampère on unit electric measurement and Maxwell on electromagnetic fields would be the main laws in this category.

In the behavioral environment we find laws which are many and varied governing the different phases of phenomenal perception. The pregnancy law, of which we have often spoken, is perhaps the

10 Koffka, The Principles . . ., p. 79.
most important and most widely used law in the Gestalt behavioral environment. It states: "Psychological organization will always be as good as the controlling circumstances permit." In this form the law seems anything but definite. However, as has been seen. Katz clears up some of the obscurity by explaining: "It would be emphasized that 'good' refers to such characteristics as regularity, symmetry, inclusiveness, unity, harmony, maximal simplicity and conciseness." Figure 2 gives a typical example of how the law of pregnancy works. In this example a figure which is not entirely symmetrical seems symmetrical to the observer at first glance. The subject organizes the stimulus situation into an experience as "good" as the controlling circumstances will permit.

![Figure 2](image)

**FIGURE 2**

**THE LAW OF PRAGNÄNZ**

Other laws which play a role in the subjective organization of the perceptual-behavioral field are: the law of proximity, 14

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12 Katz, p. 40.

13 Ibid.

14 See Chapter II, pp. 29-30 of this thesis.
the law of similarity, the law of closed forms, etc.\textsuperscript{15} The law of similarity, for instance, states: "When more than one kind of element is present, those which are similar tend to form groups." And the law of closed forms says: "Other things being equal, lines which enclose a surface tend to be seen as a unit."\textsuperscript{16}

Such are the rules governing the behavioral environment. They are in many respects identical with rules used by other systems of psychology to explain perceptual phenomena. Their purpose, like that of the rules of the geographical and physiological environments, is to put scientific certitude into the obscurity necessarily resultant on a doctrine that holds no immediate knowledge of the outside world. But his explanation suffers the same drawbacks as all other \textit{a priori} explanations fashioned to explain the immediately known. It seems artificial and leaves several important questions unanswered. The most important of these questions entails the origin of the laws themselves. If, as the Gestaltists say, the stimulus remains distorted, whence does the law and order suddenly arise correcting the distortion? The laws of themselves will not explain the difficulty. In the Gestalt explanation, they are introduced as a sort of \textit{deus ex machina} intervening and saving the Gestaltist from the uncertainty of his geographical environment.

\textsuperscript{15}For an excellent explanation of Gestalt laws see Hartmann, pp. 70-77.

\textsuperscript{16}Katz, pp. 25-26.
This point introduces us to a discussion of the Gestalt psychologist's ultimate explanation of the rules we have just studied. For when we inspect the ultimate explanation behind the rules for the behavioral environment we find something surprising! For the Gestaltists say that the ultimate explanation for the behavioral environment must be found in the rules of physics. Therefore, activity in the behavioral area would seem to be governed by rules of physics. Koffka, for instance, makes this statement:

I admit that in our ultimate explanations, we can have but one universe of discourse and that it must be the one about which physics has taught us so much. Not only is the energy which is consumed in our behavior of chemical origin, the forces which are responsible for each individual motion must be considered as physico-chemical system by itself, although depending for its existence upon a geographical environment, and its actions must be ultimately explained in terms of processes within this system. If an action is reducible to a causal sequence of organic processes, it becomes intelligible because it is then reduced to one universe of discourse which is the same as that in which its actual movements take place.17

The context of this statement is concerning the inadequacy of the behavioral environment as an ultimate explanation, or, as Koffka says, as the total psychological field. This statement of Koffka's betrays his strong tendency toward materialism. It indicates that if he were forced to make a choice, Koffka would adhere to the tenets of materialism over all others.

The reason for our long introduction to and treatment of the Gestalt laws, then, was mainly to point out the fact that the laws of physics are behind the wording of the laws in each Gestalt

environmental field. We will now study some of the implications resulting from this fact.

We might begin our discussion of implications by asking this question: by subjecting the behavioral environment (especially) to the laws of physics does not Gestalt psychology eliminate a specifically phychic realm and hence open itself to the charge of materialism? This would seem to be the conclusion one would draw from the above statements on laws. However, the leading Gestaltists, especially Köhler, do not favor the appellation "materialist." This is obvious from such statements as the following:

In the meantime those ideas about physical nature which once were dominant among physicists, and in still cruder form among the Materialists, have been thoroughly and forever discarded.18

And Koffka:

Thus the alleged materialistic bias of our theory disappears. A physiological theory which allows to physiological processes more than mere summative combination of excitations is less materialistic than psychological theory which allows only sensations and blind associative bonds between them.19

The reason why the Gestaltists do not want to be called materialists is that they claim to have a psychology which goes beyond the mere material for its explanations of behavior. The Gestalt psychologists, in fact, give the impression of having a

18 Köhler, Value in the World of Facts, p. 192.
19 Koffka, The Principles... , p. 65.
definite antipathy for the tenets of materialism. For they so often speak of such things as "higher mental functions," 20 "value" and "requiredness," 21 "significance and meaning," 22 etc. No psychology which holds such data could be considered an expressly materialistic psychology. The fact is that the Gestalt theorists expressly repudiate materialism.

What the Gestaltists mean by such terms as "materialism," "higher mental functions," etc., is another, perhaps more pertinent, question. In other words, the Gestaltists may be making the above terms fit their own meanings and definitions. In this case their repudiation of materialism would be merely a verbal repudiation; it would not touch the real order. As regards what the Gestaltists hold concerning mind and mental functions, they are always a bit vague. 23 They do not seem to want to be too categorical as yet. But let us look at the word "materialism" as the Gestaltists use it. Here they seem to be more straightforward in giving their opinion.

In speaking of materialism, the Gestaltists often say they do not hold "old" materialism which they define as a type of

21 Köhler, Value in the World of Facts, esp. Chs. II and III.
23 Witness some of the vagaries of the Gestaltists when speaking of "consciousness." (See Koffka, The Principles... , pp. 65-66.)
atomism. They maintain that their type of materialism, if you want to call it that, is something "noble." It does not reduce everything to mere matter, but rather gives matter a higher place of being. This argumentation, while it attempts to point out the intrinsic worth of material being, refuses to face the basic fact of the essential nature of matter as opposed to mind. It is characteristic of Gestalt doctrine not to want to admit any differences (real distinction) in nature. This leads one to think that the Gestaltists repudiate an atomistic materialism not because it is materialistic but because atomistic. And they substitute a Gestalt materialism not because materialistic but because Gestalt. Koffka, in his quotation above, is getting at this very point without recognizing it.

Hence it seems that, while the Gestaltists outwardly reject materialism, this rejection may be more verbal than real. If

24 Ibid., pp. 11-13.
25 Wertheimer, "General Problems," as summarized by Ellis, p. 9.
26 Ibid.
27 The Gestaltists have the tendency to reject all real distinctions in order to force all things into their category of whole physical structures. Koffka denies any distinction, for instance, between quantity and quality (See The Principles, ... , pp. 13, 22). Katz criticizes Gestalt for shunning the problem of what he calls "multiple stratification of consciousness" (p. 79), and then asks the question "... how Gestalt theory can explain individual differences" of any sort, not just in mental-sense life. (p. 165).
27a See above, p. 81, n. 19.
28 This seems to be the case when we inspect diligently some of Koffka's statements on materialism (see quotation from Koffka on the subject on p. 78 of this thesis).
so, the Gestalt doctrine could be categorized as a type of monistic materialism. We have indications of this from sources more definite than just the implications of the laws. For instance, Kurt Koffka says in one place that it would be a "totally unintelligible" assumption to say that the phenomenal world is something completely different from the physiological. He concludes in this way:

Thus, isomorphism, a term implying equality of form, makes the bold assumption that the "motion of the atoms and molecules of the brain" are not "fundamentally different from thoughts and feelings" but in their molar aspects, considered as processes in extension, identical.30

He continues later:

Granted, then, that our theory will be a molar theory, nevertheless, it is a purely physiological theory, even though mental facts, facts of direct experience, are used in its construction.31

It is true that in the passages quoted above Koffka says that the three psychological fields are the same "in their molar aspects," meaning perhaps merely that all three environmental fields are structured. But no matter how often we save the Gestaltists from materialism, it is nevertheless true that the general purport of their arguments are materialistic.32

A criticism of Gestalt psychology as a system holding monistic

30 Ibid.
31 Ibid., p. 64.
32 In another place Koffka seems to identify Gestalt psychology with the admittedly materialistic psychology of Watson, making the Gestaltists "field-Behaviorists." (See The Principles, p. 66).
materialism could be given, then, from what the Gestaltists im-
plicitly hold. However, such a criticism would be external, 
arguing from principles extrinsic to the system criticized. A 
more telling critique is one that is internal, arguing from in-
ternal inconsistencies or contradictions within the system itself. 
This latter type of criticism is what we intend to use.

The main point of criticism that we bring against the Gestalt 
document, then, is its internal inconsistency. The Gestaltists 
want to keep what they call higher mental functions and facts 
of mental life, but at the same time they want to reduce all to 
a theory approachable by the laws of physics. Such a position 
is impossible. It is a blatant inconsistency in the very funda-
mental principles of the system.

Approaching the matter from another direction we find the 
same inconsistency, this time concerning the alleged basis Ge-
stalt has in psychophysical parallelism. Nearly all of the lead-
ing Gestalt psychologists hold expressly that their system is one 
of psychophysical parallelism.33 Of Köhler's isomorphism Katz 
says that "it may be regarded as a special sort of psychophysical 
parallelism."34 It is logical for them to hold this because of 
their rejection of any inter-causality between the psychic and 
physical orders.35 But whether it is possible for them to hold

33Petermann, p. 56; Katz, pp. 93-94.
34Katz, p. 93.
such a doctrine, considering the purely materialistic trend of their whole doctrine, is doubtful. For to hold phychophysical parallelism implies the acceptance of a dualistic system of psychology. As we have seen, however, all the Gestalt laws and many of its implications necessitate a monistic system. Katz himself admits this. He says:

But if it should be considered possible to reduce mental phenomena to physical terms, with the physical form as the irreducible element, then mental phenomena will simply be sacrificed to monism. However, Köhler's often-repeated comments on subjective phenomena suggest that he does not in reality wish to make Gestalt psychology a physical science. He states that these subjective phenomena are the soundest reality with which psychology deals, and this train of thought does not lead to physical monism. It leans towards psycho-physical parallelism, whose profundity has been increased by Gestalt theory.36

The inconsistency is evident. It seems that the Gestalt theorists want to hold psychic phenomena, but at the same time they want to hold a theory which explains all phenomena according to physical rules. This is a dilemma which allows only one mode of escape. The Gestaltists must choose either a monistic philosophy or a dualistic one. They cannot take both. And if they choose the tenets of monistic materialism, they must take the logical conclusions of such a philosophy.

Perhaps these theorists want to keep a parallelism but one in which both sides of the parallel are in the physical order. This could be the case since they insist so strongly on a definite cleavage between the physiological and the behavioral environ-

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36 Katz, P. 94.
ments, a cleavage which allows no inter-causality. In this way, perhaps, the Gestaltists think they could hold to a certain monism or homogeneity in nature and at the same time section off the purely physical from the behavioral or conscious. In such a case, however, they would not be holding psychophysical parallelism but rather some form of, let us call it, physiophysical parallelism.

Thus far in this chapter we have seen the Gestalt laws and their implications. Besides, we have given a criticism of the Gestalt theory on the basis of internal inconsistency between the obvious implications of Gestalt laws (and certain statements made by the Gestaltists) and explicit statements by leading Gestaltists contrary to these implications. Before leaving the subject of Gestalt laws, however, we would like to pursue one more avenue of possible criticism.

We saw in the beginning of this chapter that the purpose of the Gestalt laws was to establish some basis of certitude for the Gestalt theory. But how much certitude are the laws actually able to give? A good method of answering this question is to inspect the Gestalt concept of order, which is, theoretically, the over-all effect of the laws. The Gestalt theorists often refer to the "causal harmony"37 in things and the "inner forces" by which physical being is "directed"38 to a certain goal. But

37 Köhler, "Some Gestalt Problems," as summarized by Ellis, p. 65.

38 Ibid., p. 64.
what principles do they give to account for this order and direc-
tion? They have none. They reject teleology and the vital
principle* of Hans Driesch and his followers. The Gestaltists
conclude: "Order is possible and actually occurs by means of
spontaneous self-structuring of related physical systems." In
other words, the basis for Gestalt certitude is in their laws,
the basis of their laws is physics and physical order. But
here, again, the Gestalt explanation is weak. For the dichotomy
between the physical and behavioral environments remains. As
we have seen, the Gestaltists hold that the stimuli never quite
reach us the same way as they proceed from the object. As long
as these premises are held, one can always question the possi-
bility of certitude with regard to the objects of the physical
environment. There is an order in the behavioral environment,
but is it the order of the physical? And the basis of physical
order is not a set principle of any sort, rather it is the mere
"spontaneous self-structuring" of the physical system. This seems
like a rather haphazard principle to be the basis of certitude
for a system.

We finally come to a question which is perhaps the most basic

* Wertheimer, "Gestalt Theory," as summarized by Ellis, pp.
  7-8.
* Katz, p. 56.
* Koffka, The Principles... , p. 17.
in all of Gestalt theory. It concerns the Gestalt answer to the problem of unity and multiplicity\(^43\) in psychological perception. This is the problem which Gardner Murphy calls one of the most important in contemporary psychology, the "issue of wholes and parts."\(^44\) It is Gestalt psychology's main bone of contention in its reaction against atomism. The fact that this age old problem is the \textit{bête noire} for the Gestaltists leaves them open to the oft-repeated charge that they are not historically-minded and, hence do not recognize the origin of their ideas. To this the Gestaltists reply that: "It is perfectly true that the famous problem of 'The Many and the One' goes back to the Ionian and Eleatic nature-philosophers of pre-Socratic Greece, but to have raised or stated a problem is something altogether different from solving it."\(^45\) The question we ask here is: does Gestalt psychology solve the problem, at least in the field of perception? The answer to this question should be found in the Gestalt basic theory of form or structure. Therefore, in this last part of the thesis we will inspect the concept of form in Gestalt theory of perception.

We might begin this discussion by asking the question: what is Gestalt psychology's criterion of wholeness or totality? Put

\(^{43}\)We will not attempt a criticism here of Gestalt experimental work. This has been ably done by Petermann in "Part Two" of his: \textit{The Gestalt Theory and the Problem of Configuration.}  

\(^{44}\)See p. 18 of this thesis.  

\(^{45}\)Hartmann, p. 298.
in another way: what is the ultimate criterion of form or being or, if you want, substance? The whole theory of perception, remember, is built on the phenomenal experience of a form. This form seems to be a set and stable entity in the eyes of the Gestaltist.\textsuperscript{46} And Katz says explicitly: "The basic assumption of Gestalt is that a form, regarded phenomenologically, is a final and irreducible entity."\textsuperscript{47} The form, then, is the basic entity for Gestalt psychology, the final answer to the problem of multiplicity. The question is, however, how such a form or structure came about in the first place. Does the form (1) exist in the real order before sensation takes place at all, or (2) is it imposed upon the outer world by the phenomenal environment? The Gestalt psychologists seem to explicitly wish to hold the former. (However, if they can be shown to hold the latter, they are open to the charge of subjectivism.) This would even catch the Gestaltists in a worse form of internal inconsistency than the monist-dualist dilemma mentioned above. For if the Gestalt theorists wish to maintain anything, it is the idea that their psychology is one of absolute scientific objectivity, a statement they never tire of asserting. But let us examine the above two possibilities to see which the Gestaltists really hold.

(1) There is no doubt that the Berlin School of Gestalt psychology holds that forms or structures actually exist in the

\textsuperscript{46} Katz, p. 45.

\textsuperscript{47} Ibid., p. 49.
physical world. This is quite evident from a study of the theory of isomorphism. But when we ask for some criterion of form in this real world, the Gestaltists have none to offer. It is very important, after all, to have such a criterion if one is to hold that there are definite units in nature which are self-subsistent and incommunicable. For the question can always be asked: why are certain qualities in nature necessarily grouped together and others left out? Why are certain things taken as single entities separate from others? Perhaps the Gestaltists balk at answering such questions because they do not want to commit themselves to a definite metaphysics. For, truly, to answer such queries one would have to have a definite criterion of form in the real order and that would demand admission of some sort of substance or unum per se.

(2) On the other hand, the words "regarded phenomenologically" in the quotation above from Katz make one think that the second mentioned possibility is true, namely, that the phenomenal environment imposes forms on reality. In other words, the ultimate entity for Gestalt psychology is really found in the phenomenal order. The Gestaltists prove legitimately by the phenomenological method that we experience structured wholes in perception. But, then after that, they seem to try to submit all other realms of being to a strict law which is actually valid only in the mind. We will now choose at random several quotations

48 See p. 88, note 47 of this thesis.
from Fr. Herr's very informed article on Gestalt psychology to substantiate the above assertion.

There is an implicit assumption in all this work [i.e. of Gestalt psychology] that every perception can and must be explained by the same general law, regardless of the nature of the object. They will not change this assumption even though it leads to insoluble (to them) dilemmas.49

Koffka concluded a debate on the actuality of sensory elements that the unique act of perceiving Gestalten immediately sufficed, and that the mind was the real cause of the relatedness thus making the sensory stimulation merely a condition.50

Gestaltists now argued that there were characters given in perception which have no corresponding happening in the sense organ.51

To avoid the terrible pit of atomism they [Gestaltists] cling closely to the horn of subjectivism. . .52

In the last part of his treatise,53 Petermann expends almost all of his efforts in an attempt to hang the albatross of subjectivism on the Gestaltists. His big contention is that the Gestaltists try to objectify preconceived theories which actually apply only to the phenomenal order. In this sense, as Petermann ably points out, they build for themselves a whole ontological system based on their own a prioristic assumptions.

We quote:

\[49\text{Herr, p. 234.}\]
\[50\text{Ibid., p. 236.}\]
\[51\text{Ibid., p. 237.}\]
\[52\text{Ibid., p. 236.}\]
\[53\text{Petermann, p. 296.}\]
The psychophysical conclusions which have a central position in the gestalt theory, are actually--far indeed as they are from deserving to rank as proven conclusions--nothing other than axioms of a purely philosophical nature underlying the whole system.54

The gestalt theory includes a radical ontologization of psychology. ... What this idea of gestalt uniformity in reality leads to philosophically, is that an autochthonous ontological reality is attributed to the gestalt as such, in this sense: that any units of reality, so far as they are identifiable as gestalten, contain forces, tendencies, modes of action, directly determined in their own right, which must be ascribed to them just in virtue of their property of being gestalten.55

The ontological subservience of the gestalt theory to the ultimates we have described, betrays itself, in a very fundamental way, purely psychologically, in reference to the determination of the contents of what must be called the psychically real. It entails the imposition of specific and utter uniformity on the entire range of psychological facts.56

From our study of the implications of the Gestalt theory, then, the bases of our criticism are easily discernible. The Gestaltists strive valiently to remove all shadow of materialism from their tenets in order to retain a psychology of Mind. But with all their efforts, they seem to achieve nothing more than a verbal distinction between their alleged psychophysical parallelism, and the tenets of monistic materialism. The result is that they produce many good points of criticism against atomistic materialism but fail to give any positive explanation of their stand on materialism. Secondly, in an effort to maintain certi-
tude, they create a very intricate system of laws connecting the different environmental fields, but fail to give an adequate explanation of the basis and source of their laws. The result of this is an artificial and a prioristic network of laws which seem to be forcibly imposed upon the environments from the outside. This leads to our final criticism of subjectivism in Gestalt. This criticism, more than the others, strikes at the very basis of Gestalt principles, as we have seen.

But whether or not we can actually hang the albatross of subjectivism—or any other albatross for that matter—on Gestalt psychology seems to the writer to be a matter still up to the Gestalt theorists to choose. For until they explicitly commit themselves to a definite set of philosophical principles, it will be impossible to pass just judgment on them. Perhaps at present they feel, as Hartmann intimates, that they have "no choice but to be vague or be wrong."57 But this state, of course, cannot endure for long. In this thesis we have already quoted Wolfgang Köhler as having once said: "In my opinion one cannot grasp the position of the Gestalt theory until one has learned to wonder about the fact of concrete articulations in the visual field."58 This characteristic Gestalt spirit of "wonder" is basically what the Greeks meant by "wonder," namely, a strong intellectual curi-

57 Hartmann, p. 296
58 See pp. 28-29, note 20 of this thesis.
osity and spirit of inquiry. It has lead the Gestaltists to per-
form numberless useful and inspiring experiments, experiments
which are even now proving a definite contribution to the body
of modern psychology. It is hoped that the coming years will
answer some of the tantalizing enigmas still connected with the
Gestalt theory, and further develop the seeds of truth that de-
finitely are present in that theory.
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APPROVAL SHEET

The thesis submitted by Mr. Thomas J. Zuber has been read and approved by three members of the Department of Philosophy.

The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated, and that the thesis is now given final approval with reference to content, form, and mechanical accuracy.

The thesis is therefore accepted in partial fulfillment of the requirements for the degree of Master of Arts.

Jan. 5, 1956
Date

Signature of Adviser