STRUCTURES VERSUS SETS: THE PHILOSOPHICAL BACKGROUND OF GESTALT PSYCHOLOGY

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It is customary to claim that Gestalt psychology originates with Ehrenfels' famous article "Ueber Gestaltqualitaeten."[1] But even a cursory study of this paper shows that Ehrenfels touches upon a number of philosophical problems which go back, at least, to Berkeley's revolt against material substances and which, moreover, arise anew in contemporary discussions. I shall trace some of these problems back to their origin and make a number of comments on their present-day significance.

I

Everything there is, is either a substance or a modification of a substance. This ontological dogma prevailed until and including the time of Descartes. In more contemporary terms, the traditional view holds that everything is either an individual thing or a property of such a thing. Descartes, although he is correctly viewed as the father of modern philosophy, fully accepted this traditional dogma. He merely attacked a minor and auxiliary dogma, namely, the classification of minds as properties of bodies. Minds, he argued against the tradition, are individual things just like bodies. They, too, have characteristic properties, but are not themselves properties. A person, in the Cartesian vein, is a combination of two individual things, a mind and a body. The tradition, according to Descartes, did not err by insisting on an exhaus-

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tive division of all existents into individual things and properties; it merely made the mistake of assigning minds to the category of property rather than to that of individual thing.

But Descartes' relatively small revision of the prevailing view of his day had momentous consequences.[2] It invited, after a very short time, an attack on the fundamental dichotomy itself. Berkeley initiated this attack. He argued that there are no such things as material substances. An apple, for example, is not, as tradition has it, a material substance which exemplifies certain properties, but is, rather, *a collection of its properties*: "Thus, for example, a certain color, taste, smell, figure, and consistence having been observed to go together, are accounted one distinct thing signified by the name apple."[3] Berkeley proceeds to think of these properties, this particular color of the apple, this particular smell of it, etc., as ideas in the mind. But this is not an essential feature of his rejection of material substances. What is essential, is his contention that such things as apples are neither material substances nor properties of material substances, but belong to the entirely different category of *collection* and are, specifically, *collections of properties*.

Berkeley's contention raised a number of urgent questions. What is a collection, that is, what distinguishes a collection from a so-called substance and from a property? Are there collections which are not collections of properties? And so on. It is one of the baffling facts of modern philosophy that neither Berkeley nor any of his followers addressed himself explicitly and at length to these questions. Such questions are eventually taken up, however, by Brentano and his students. They are discussed in great detail by Twardowski, Meinong, Stumpf, and Husserl. Ehrenfels, of course, was a student of Meinong's, first at the University of Vienna, then at the Uni-

[2] Compare, for example, Richard A. Watson, *The Downfall of Cartesianism, 1673-1712* (The Hague, 1966).

[3] George Berkeley, *A Treatise Concerning the Principles of Human Knowledge*, Part I, para. 1.

versity of Graz.[4] And Meinong's first philosophical work, *Hume Studien I*, deals largely with Berkeley's philosophy. Thus there is a direct historical line from Berkeley to Ehrenfels.

But let us leave the historical context and turn to the systematic questions. If an apple, as Berkeley maintains, is a collection of properties, then it is obviously a *whole* of some sort; a whole that *consists* of properties, a whole whose *parts* are properties. A substance, on the other hand, is conceived of as *having* properties, but is not thought of as *consisting* of properties. A substance is not conceived of in the tradition as a whole whose parts are properties. This, then, is the most fundamental difference between the claim that an apple is a substance and the claim that it is a collection of properties: as a substance, the apple *has* properties but does not *consist* of them; as a collection, the apple *contains* its properties as *parts*. In a nutshell, Berkeley conceives of the relationship between a property and the thing of which it is a property as a *part-whole relation,* while tradition does not.

A perceptual object is thus conceived of as some kind of whole. But what kind of whole? There seem to be all sorts of wholes. In particular, a mere "aggregate" of things, a mere "sum" of entities, constitutes a kind of whole. It was not until the second half of the nineteenth century that the nature of such "aggregates" or "sums" was studied in detail. I am, of course, referring to Cantor's studies in set theory.[5] What Brentano's students and other proponents of Gestalt psychology call, somewhat disparagingly, "mere aggregates" or "mere sums" are nothing but such *sets.* A set is a kind of whole. It is a complex entity, and its parts are called *"members."*

A collection of properties, as conceived of by Berkeley, cannot be a mere set of properties. To be more precise, the word "collection" cannot mean, in this context, the same as

[4] See Meinong's vita in my *Meinong* (London and Boston, 1974).
[5] Georg Cantor, *Gesammelte Abhandlungen* (Hildesheim, 1962).

what we mean by "set". According to Berkeley's view, certain properties form collections; and what we call perceptual objects are nothing but such collections. Assume now, for the sake of argument, that only two individual things, A and B, happen to exist and that A is green and round, while B is blue and square. According to Berkeley's view, then, just two collections exist, the collection A which consists of the two properties green and round, and the collection B which consists of the two properties blue and square. But in this situation, according to set theory, many more sets than just these two exist. For example, the set whose members are the two properties round and square exists. Thus by a collection, one cannot mean a set.[6] Collections must be distinguished from sets, even though both are wholes.

A collection of properties, as distinct from a set, consists quite obviously of properties *in association* with each other. The two properties green and round as associated with each other form a collection; and so do the two properties blue and square. But even though the set whose members are the properties round and square also exists, these two properties are not associated with each other and, hence, there is no corresponding collection. In short, a collection of properties differs from a set of properties in that the former consists of properties as associated with each other, while the latter merely consists of properties. And it is clear that there are also other wholes which resemble collection but differ from sets in that they consist of entities *in connection with each other*. I shall call all such wholes *"structures."* It is possible to give a precise description of the difference between sets and structures: two sets are identical if and only if their members are identical, while two structures are identical if and only if (a) their non-relational parts are identical, (b) their relational parts are identical, and (c) the non-relational parts stand in the same relations to each other.[7]

[6] Compare, for example, H. Hochberg, "Things and Descriptions," *American Philosophical Quarterly*, 3 (1966), 1-9.

[7] In order to grasp the distinction between structures and classes, one must,

There are, as I just mentioned, different kinds of structures. Berkeleyan collections, if there are such entities, constitute only one kind of structure. An apple, for example, is a *spatial* structure, consisting of certain spatial parts, its seeds, its skin, etc., which stand in certain spatial relations to each other. Furthermore, an apple, conceived of as an enduring object with a temporal duration, is also a *temporal* structure, consisting of temporal parts. We must, therefore, sharply distinguish between two quite different conceptions of the apple. It may be conceived of as a structure of properties in the association relation with each other, or it may be conceived of as a structure of spatio-temporal pieces, which stand in spatial and temporal relations to each other. Furthermore, the color of the apple is a part of it in quite a different sense from the one in which a seed is a part of the apple. Just as the relations which hold between the parts of two structures may be fundamentally different, so may the part-whole relations involved in two structures be quite different. A seed is a spatial part of the apple; its color is not a spatial part. This basic distinction, too, occurs already in Berkeley. Berkeley argues, against Locke, that while we can imagine a head of a horse by itself, and in this manner can abstract from the rest of the horse, we cannot have an idea of motion without the idea of a moving body and, hence, cannot abstract the former from the latter.[8] In our terminology, Berkeley distinguishes here between the manner in which a spatio-temporal part of a spatio-temporal whole is a *part* of the whole, on the one hand, and the way in which properties are parts of the collections of which they are parts, on the other. We shall see in a moment that this distinction

of course, acknowledge the existence of *relations*. It is therefore not surprising that the "ontological discoveries" of structures and relations go hand in hand. See, for example, Meinong's "Ueber Gegenstaende hoeherer Ordnung und deren Verhaeltnis zur inneren Wahrnehmung," in A. Meinong, *Gesammelte Abhandlungen*, vol. 2 (Leipzig, 1913), 379-480. And compare also G. Bergmann, "The Problem of Relations in Classical Psychology," *Philosophical Quarterly*, 2 (1952), 140-152.

[8] George Berkeley, *A Treatise* etc., Introduction, para. 10.

plays an important role in later discussions of wholes and parts.

Let me sum up. I have claimed that there are two fundamental kinds of wholes, namely, sets and structures, and have distinguished between them in terms of the conditions under which they are identical. We have noted further that there are spatio-temporal structures as well as "abstract" structures. If Berkeleyan collections existed, they would be such "abstract" structures rather than sets.

II

Let us now return to the historical context. Brentano's students worked within the framework of a Berkeleyan ontology. They, too, thought of individual things as bundles of properties. They, too, distinguished between two kinds of parts, so-called *independent* parts of wholes —our spatio-temporal parts of structures— and so-called *dependent* parts of wholes —our properties as parts of collections. And these philosophers, as well, did not, at first, recognize the ontological implications of their conception of individual things as collections of properties and as spatio-temporal wholes. This recognition grew very slowly. One can follow its growth by comparing, for example, Meinong's review of Ehrenfels' article with Meinong's later paper on objects of higher order, or by comparing Husserl's paper on abstract and concrete contents with his later discussion in the *Logical Investigations*.[9] Ehrenfels' article, seen from this perspective, forces Meinong, Husserl, and others to distinguish more clearly and precisely between mere "sums" of entities, on the one hand, and structures, on the other. It forces them, in other words, to distinguish between sets and structures. They can no longer think of an individual thing as some kind of bundle of prop-

[9] Meinong's review of Ehrenfels is called "Zur Psychologie der Komplexionen und Relationen," in *Gesammelte Abhandlungen*, vol. 1 (Leipzig, 1914), 280-303. Compare also Husserl's "Ueber abstrakte und konkrete Inhalte," *Philosophische Monatshefte*, 30 (1894), with his later discussions in the *Logical Investigations*, transl. by J. N. Findlay (New York, 1970).

erties or another, but must acknowledge the existence of structures.

A Gestalt, according to Ehrenfels' main thesis, *is something other than the sum of its parts.* A structure, we may try to paraphrase, is not the same as the set consisting of the non-relational parts of the structure. Ehrenfels' argument for this thesis can be glimpsed from the following quotation from Meinong:

> But one can "assert at once that different complexes of elements, if they are nothing else but the sum of these, must be the more similar the more similar their individual elements are to each other." If similarity, even equality, obtains nevertheless in the cases mentioned above despite greater or lesser dissimilarity of the elements, then "the similarity between spatial and tonal configurations [*Gestalten*] rests on something other than the similarity between the elements . . . Hence those configurations must be something other than the sum of the elements."[10]

In our terminology, Ehrenfels' argument comes to this. The degree of similarity between two sets can only be a function of the similarities between their respective members. Thus if we encounter two wholes which are very similar to each other —say, the same melody in two different keys— even though their respective parts are rather dissimilar to each other, then these two wholes cannot be sets. This argument is in my view perfectly sound. It does indeed prove that certain wholes cannot be sets. It proves, for example, that a melody is not identical with the set of tones of which it consists, and that a spatial object is not the same as the set of

[10] A. Meinong, "Zur Psychologie der Komplexionen und Relationen," *Gesammelte Abhandlungen*, pp. 281-282. Ehrenfels' argument, by the way, goes back to Ernst Mach. See Ehrenfels' letter to Meinong in *Philosophenbriefe* (Graz, 1965), pp. 74-75.

its spatial parts. In either case, the parts of these wholes are arranged in certain ways, so as to form this particular whole rather than some other. The same tones, arranged in a different temporal order, for example, yield a different melody; the same four triangles, arranged in a different way, yield, not a square, but some other figure.

One can sharpen Ehrenfels' point by considering two wholes which have the very same non-relational parts. Consider, for example, the *series* of natural numbers, arranged by size, from 0 to 10, on the one hand, and the series formed from the same numbers, but in reverse order, on the other. These two series are not identical. The two sets of numbers, the numbers of the first series and the numbers of the second series, however, are the same. It follows that the two series are not identical with the respective sets.

III

Brentano's students realized that structures belong to the basic furniture of the world. This is one of their greatest achievements. They arrived at it by distinguishing between mere sets of entities and configurations of such entities. And they expressed this distinction by the slogan: *A whole is more than the sum of its parts*. But this slogan, like all slogans, may also give rise to a number of misunderstandings. It can be understood to mean, not that a structure is different from the set of its parts, but that a structure cannot possibly *consist* merely of parts in relation to each other. Gestalt psychologists have not been content with pointing out that there are wholes which are structures rather than sets, but have maintained, mistakenly, that structures do not even *consist* of related parts, *that they cannot be analyzed at all*.

A structure, according to our description, consists of certain non-relational parts which stand in certain relations to each other. Ehrenfels, Meinong, Husserl, and others, however, approached this whole matter from a psychological point of view, and did not originally ask, as we do: what

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distinguishes a set from a structure? Rather, they asked: in what does the *experience* of a structure consist, granted that it somehow involves the experience of its non-relational parts?[11] As they saw it, our view implies that the experience of a structure consists in an experience of its non-relational parts plus an experience of certain relations between these parts. And they claimed, correctly, that the experience of a structure is not of this kind. But the fault is theirs, not ours. The experience of a structure, in our view, does not consist of successive experiences of non-relational and relational parts, but consists in the experiencing of certain parts *as being in relation* to each other.

To say that a structure *consists* of certain parts in relation to each other is not to say, as some Gestalt psychologists seem to think, that it is a *set* consisting of certain non-relational elements and certain relations. We must in every case distinguish quite clearly between a structure, on the one hand, and the set which contains all the parts of this structure, non-relational and relational parts alike, on the other hand. Consider two rows of squares. The first consists of the squares *A, B* and *C,* arranged in this order from left to right, while the second consists of the same squares, arranged from left to right, but in reverse order. The parts of the first row form a set consisting of the three squares and the to-the-left-of relation; and so do the parts of the second row. But the two rows are not identical with each other. This proves that the two rows are not identical with the two associated sets, even if we include the relation as a member of the sets.

This last example shows also that the analyses of two different structures may yield the same list of entities. A list of names of entities represents a set. What corresponds to such a list, in other words, is always a set. We can understand now why some Gestalt psychologists objected so strenuously, albeit mistakenly, to analysis.[12] To analyze something, ac-

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[11] See Meinong's "Zur Psychologie der Komplexionen und Relationen."
[12] Compare, for example, Hans Volkelt, "Grundbegriffe der Ganzheitspsycho-

cording to this mistaken line of reasoning, is to treat it as a set rather than a structure. Hence one must never even attempt to analyze a structure. But this line of reasoning is not sound. It is true that the analysis of any kind of complex entity yields a set of entities. Such is the nature of analysis. The constituents of complex entities of any kind do indeed form a set; and if one wishes to know what the constituents of a complex entity are, one cannot but analyze it. Such is the purpose of analysis.

But the fact that the product of every analysis is a set does not mean that the entity which one has analyzed is a set or has been treated as one. A structure is not a set, even though its analysis yields a set. To analyze a structure is not to think of it as a set, but to think of it as a structure whose analysis inevitably yields a set. Analysis does not determine what *kind of entity* we are analyzing, it merely tells us that the complex entity under study, no matter of what kind it may be, consists of such-and-such constituents. Of course, if we know what entities constitute a given whole, we know also, in some sense, what kind of entity it is. But this is clearly a different notion of kind. We must, at any rate, sharply distinguish between the following two questions. First, what kind of entity is a structure, a class, etc.? Secondly, what are the constituents of this structure or that class?

It has also been objected, to our conception of so-called *Gestalten* as structures, that two wholes can resemble each other even if their relations, and not just their non-relational parts, greatly differ from each other.[13] It has been claimed, in other words, that some similarities between wholes cannot be explained in terms of their containing the same relations, but different non-relational parts. What this objection shows, though, is, not that certain wholes are not structures, but rather that structures may be *isomorphic* to each other. This

logie," in Friedrich Sander und Hans Volkelt, *Ganzheitspsychologie* (Muenchen, 1967), 31-65.
    [13] Compare, for example, Max Wertheimer, "Gestalt Theory," in *A Source Book of Gestalt Psychology*, Willis D. Ellis, ed. (New York, 1967), 1-11.

is, indeed, one of the most fundamental and fascinating features of structures.

Consider once more two series of natural numbers. The first series starts with 1, and consists of all the odd natural numbers arranged by the relation of being the next odd natural number in the series of natural numbers. The second series starts with 2, and consists of all even natural numbers arranged by the relation of being the next even natural number in the series of natural numbers. These two series consist not only of different numbers, but contain two quite different relations. Yet there is a certain resemblance between them. They are, as mathematicians say, *isomorphic* to each other. Two structures S_1 and S_2 are in this sense isomorphic to each other if and only if: (1) the non-relational constituents of S_1 are coordinated one-to-one to the non-relational constituents of S_2; (2) the relations of S_1 are also coordinated in this fashion to the relations of S_2; and (3) if any non-relational parts of S_1 are related to each other by the relation R_1, then the coordinated non-relational parts of S_2 are related to each other by the coordinated relation R_2, and conversely.

Two structures, unlike two sets, can thus be similar to each other in different ways. They may be similiar to each other, for example, in that they contain the same relations, even though these relations hold between different entities in the two structures. Or they may be similar to each other, as we have just seen, in an even more tenuous fashion by being merely isomorphic to each other.

To sum up: while it is true that a structure is not identical with the set of its parts, even the set consisting of both the relational as well as the non-relational parts, it is false to believe that it therefore does not consist of relations in addition to non-relational parts. And while it is true that two structures can be similar to each other even though they contain different relations, in addition to containing different non-relational parts, it is false to believe that therefore they cannot merely consist of relations in addition to non-rela-

tional parts. In these latter cases, the respective structures are isomorphic to each other.

IV

Gestalt psychology is founded on a second slogan: *A whole is not determined by its parts, but, to the contrary, determines the nature of its parts.* This defiant principle can also be interpreted to mean quite different things. It is obvious, from our description of the conditions under which two structures are identical, that a structure is completely determined by (1) what non-relational parts it has, (2) in what relations the parts stand to each other, and (3) by what parts stand in what relations to what other parts. Thus, if the principle is meant to deny this fact, it must be false.

However, the following quotation from an article by Wertheimer suggests a somewhat different interpretation:

> What is given to me by the melody does not arise (through the agency of any auxiliary factor) as a *secondary* process from the sum of the pieces as such. Instead, what takes place in each single part already depends upon what the whole is. The flesh and blood of a tone depends from the start upon its role in the melody: a *b* as leading tone to *c* is something radically different from the *b* as tonic. It belongs to the flesh and blood of the things given in experience [*Gegebenheiten*], how, in what role, in what function they are in the whole.[14]

A *b* as leading tone to *c*, Wertheimer asserts, is something radically different from the *b* as tonic. Now, this is quite true, since the former has the (relational) property of leading to *c*, which the latter does not have. Similarly, a woman

[14] *Ibid.*, p. 5.

who becomes a mother changes quite radically, since she is afterwards related to a child. If this is what Wertheimer has in mind, then he is pointing at an important truth; a truth, moreover, which perfectly agrees with our characterization of structures. Parts of structures, *as parts of structures*, stand in important relations to each other. They have, therefore, important *relational properties* which they would not have by themselves. Each part of a structure, we cannot but agree, is characterized, not only by the properties which it has by itself, but also by the (relational) properties which it has only by virtue of being a part of the structure. Each part of a structure is characterized, in other words, both by its non-relational as well as by its relational properties.

It seems, however, that some Gestalt psychologists may have a much stronger claim in mind when they assert that a whole determines the nature of its parts. What they seem to mean is that even the non-relational properties of parts depend on the wholes of which they are parts. This idea, the historian may note, goes back to one of Stumpf's earlier works. In his *Ueber den psychologischen Ursprung der Raumvorstellungen,* Stumpf tries to explicate the distinction between spatio-temporal pieces, on the one hand, and property parts, on the other, which we already find in Berkeley. He talks about a colored expansion and maintains that the color is somehow affected by the size of the expansion. And then he argues:

> From this [i.e. the described functional dependence of the moments of *quality* and *extension*] it follows that both are, *according to their nature, inseparable;* that they in some manner *form a whole content,* of which they are merely part contents. If they were merely items of a sum, then it would perhaps be possible that, straightforwardly, the disappearance of the extension could mean the disappearance of the quality

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(that they do not exist independently); but that
the quality gradually diminishes and vanishes
in this fashion through a mere diminution and
disappearance of quantity, without changing
qualitatively, would be incomprehensible . . .
They can in any case not be independent con-
tents. *They cannot by their very nature exist in
our ideas separately and independently of each
other.*[15]

Stumpf argues here that color and extension are insepara-
ble parts of perceptual objects. He thinks that this conclusion
somehow follows from the alleged fact that color and exten-
sion are not mere items of a sum. I do not think that it does,
but shall not pursue this point. That color and extension are
not mere items of a sum —are not mere members of a set,
as we would say— is alleged to follow, in turn, from the
supposed fact that they are somehow functionally related to
each other. Now this step of the argument is sound: if color
and extension are somehow related to each other, then they
form a structure of some sort rather than a set. Finally,
Stumpf claims that color and extension are related to each
other because the color of an expansion changes with its size.
It is this last assertion which goes to the heart of the matter
under discussion. For, if it were true, then one could with
some justification claim that the whole —the expansion—
determines one of its parts —its color— and not conversely.[16]

But this last assertion seems to me to be hopelessly con-
fused. The quality of the expansion, its color, is said to
diminish with the size of the expansion, and yet to remain
the same qualitatively. But this is clearly impossible, if it
means anything else than that the size of the expansion di-

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[15] C. Stumpf, *Ueber den psychologischen Ursprung der Raumvorstellung*
(Leipzig, 1873), p. 113.
[16] Notice that, precisely speaking, one property of the whole —its size,
conceived of as a part of the whole— determines another property of the
whole— its color, conceived of as a part of the whole.

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minishes. Either the color changes with the size of the expansion or it does not; and we know, of course, that it does not. Thus it is simply not true that the color of a whole depends on the nature —the size— of the whole.

Husserl, who approvingly quotes Stumpf on this matter, realizes that something has gone wrong with Stumpf's argument. He tries to save Stumpf's basic assertion, on which the whole argument rests, by invoking his own distinction between a color shade as an *instance* and as a *species*.[17] According to this distinction, two perceptual objects of the very same shade of color are said to contain, as parts, numerically different color instances of the same color species. And Husserl interprets Stumpf to mean that a change in size of the expansion involves a change in the color instance, even though the instance remains an instance of the same species. But this interpretation makes as little sense as Stumpf's original assertion. As long as the instance remains an instance of the same species, it cannot change at all qualitatively. As long as the colors of the different sized expansions belong to the same species, they are qualitatively the same. That is what it means to be qualitatively the same. Since size, as Husserl admits, does not affect the species to which a color instance belongs, it cannot affect the color which an expansion has.

The color of a surface, we insist, does not change with its size. What could have led Stumpf to believe otherwise? He may have confused the color of the expansion with the color of the visual sense-impression which one experiences when one sees the color expansion.[18] It may be the case, as a matter of psychological fact, that the color of the sense impression changes with the (objective) size of the expansion, even though the (objective) color of the expansion does not change. To give a more plausible example, while the length of a line does not change if we merely draw some further lines around

[17] E. Husserl, *Logical Investigations*, vol. 2, pp. 440-441.
[18] Compare, for example, G. Bergmann, *Philosophy of Science* (Madison, 1957), pp. 157-158; and his "Review of Koehler's 'Gestalt Psychologie'," *Psychological Bulletin*, 45 (1948), 351-355.

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it, the length of the sense-impressions which we experience before and after the other lines have been drawn may be different. This, of course, is the principle of an optical illusion.

What, then, becomes of the slogan that the whole determines the nature of its parts? It must be rejected, if it means that a structure determines the non-relational properties of its parts. The color of an expansion is not determined by the size of the expansion, although the color of our corresponding sense-impression may be; the length of a line does not depend on the configuration of lines in which it occurs, although the length of our corresponding sense-impression does. And in general, the non-relational properties of the parts of structures are not determined by the properties of the structures of which they are parts.

V

Last but not least, there is the claim by Gestalt psychologists that wholes have properties which none of their parts have; that there are, as it were, *emerging properties*. Much of the criticism of Gestalt psychology has centered around this contention.[19] Yet I am convinced that this claim is quite correct.[20] Consider once again a square whose diagonals have been drawn, so that it consists of four triangles. This plane figure is square; it has this shape. But none of its spatial parts is square; none of its spatial parts has this property. Thus four triangles, arranged in a certain way, constitute a figure which has the "emergent" property of being square. Of course, there are also squares which consist of smaller squares, so that our first square has a property which can equally well

[19] Compare, for example, G. Bergmann, "Holism, Historicism, and Emergence," *Philosophy of Science*, 11 (1944), 209-221; K. Grelling and P. Oppenheim, "Der Gestaltbegriff im Lichte der neuen Logik," *Erkenntnis* 7 (1937-38), 211-225 and 357-379.

[20] See my "Perceptual Objects, Elementary Particles, and Emergent Properties," in *Action, Knowledge, and Reality: Critical Studies in Honor of Wilfrid Sellars*, Hector-Neri Castañeda, ed. (Indianapolis, 1975), 129-146.

be had by parts of squares. And this raises the further question of whether a structure may have a property which no part of a structure ever has, as long as it is not itself a structure. Are there properties, in other words, which belong exclusively to certain kinds of structures, never to their parts? Consider the series of natural numbers beginning with zero. This series has a first number, but it has no last number. No number ever has this characteristic; nor does anything else, unless it is a series of a certain sort. Thus it is clear that structures may have unique properties which distinguish them from other kinds of structures and, more importantly, from all other kinds of entities.

Having sided with the "wholist" in regard to emergent properties, I hasten to add a word of caution. The kinds of structures that catch the fancy of social scientists —roughly speaking, groups and institutions— do most certainly have some properties which human beings do not have. On the other hand, it is equally certain that human beings have properties which no such structure ever has. For example, a person may hold a belief or exercise his will, but a structure —any structure, even one that consists of people— can neither believe something nor have its will. There are no such things as the ideology of the ruling class or the will of the people, if they are supposed to be properties of these structures. The critic of "wholism" is entirely correct when he points out that to speak of the ideology of the ruling class or the will of the people is just to speak about the beliefs of individual people, their intentions, aspirations, etc.[21] Thus while it is true that there are such structures as families, tribes, the working class, the state, it is equally true that these entities are categorially different from people. To endow such structures with human qualities is just as silly as to endow inanimate objects with human characteristics.

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[21] Compare the papers by Ernest Gellner, J. W. N. Watkins, May Brodbeck, and Laird Addis in *Readings in the Philosophy of the Social Sciences*, May Brodbeck, ed. (New York and London, 1968).

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Grossmann intenta mostrar el origen y la relevancia actual de algunos de los problemas filosóficos tratados en el famoso artículo de Ehrenfels acerca de la psicología de la *Gestalt*. En cuanto al origen señala que un viejo dogma ontológico sostenía que todo lo que existe es o bien una sustancia, o bien una modificación de la sustancia, en términos modernos, o una cosa individual o una propiedad. Berkeley lo cuestionó sosteniendo que las sustancias materiales eran colecciones de propiedades. Los problemas a que dio lugar fueron abordados por Brentano y sus discípulos y vía Meinong por Ehrenfels.

Desde un punto de vista sistemático el autor apunta que conviene distinguir entre "todos" que forman simplemente un conjunto y "todos" que consisten en entidades conectadas entre sí llamados "estructuras". Hay, a su vez, varios tipos de estructuras: espaciotemporales y abstractas.

Para Ehrenfels una *Gestalt* era algo diferente a sus partes. Su argumento era que dos "todos" podían ser muy semejantes, aun cuando sus elementos no lo fueran, y que por lo tanto no eran conjuntos. Aunque es correcto, el lema de los discípulos de Brentano —*un todo es algo más que la suma de sus partes*— puede ser malinterpretado. Es correcto en el sentido de que una estructura es diferente del conjunto de sus partes, pero no si se entiende que las estructuras no consisten en partes relacionadas y que por tanto no pueden ser analizadas. Al decir que una estructura consiste en ciertas partes relacionadas entre sí, no queremos decir que es idéntica al conjunto de sus partes y relaciones. El análisis de una estructura nos dará sus elementos, aunque no determine el tipo de entidad de que se trata.

Se ha presentado la objeción de que dos *Gestalten* pueden asemejarse aun cuando no sólo sus partes no-relacionales, sino incluso sus relaciones difieran entre sí. Esto no muestra que no sean estructuras, sino más bien que puede haber estructuras *isomórficas*, lo cual es uno de sus rasgos más fascinantes. El autor ofrece en este punto las condiciones para que dos estructuras sean isomórficas.

Un segundo lema de la psicología de la *Gestalt* es el de que *un todo no está determinado por sus partes sino que, por el contrario, determina la naturaleza de sus partes*. Por lo expuesto se sabe que una estructura está determinada totalmente por: (1) sus partes no-relacionales, (2) las relaciones entre sus partes y (3) qué partes

están en qué relaciones unas con otras. Si el principio niega esto, tiene que ser falso.

Algunos autores parecen querer decir que aun las propiedades no-relacionales de las partes dependen del todo. Grossmann analiza en detalle el argumento tal y como lo formulan Stumpf y Husserl, mostrando las confusiones involucradas.

Se discute, para terminar, la tesis de que los todos tienen propiedades emergentes que no tienen ninguna de sus partes. El autor considera que, a pesar de las críticas recibidas, esta pretensión es correcta y proporciona un par de ejemplos. Empero, nos advierte al final que si bien es correcto que las estructuras sociales tienen propiedades de las que carecen los seres humanos, también lo es que los humanos tienen propiedades que no pueden tener las estructuras y que los "holistas" cometen con frecuencia este último error.

(Resumen de Javier Esquivel)