

On Breaking Out of Dichotomies

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One of the lesser known, but more useful, typologies distinguishes dromedaries from camels: those with one hump, who see continuities, and those with two humps, who see dichotomies. (The wit who proposed this typology is obviously himself a camel.)

There are many basic problems in psychology that neither the camels nor the dromedaries can solve. These are solved by overcoming the dichotomy in ways other than choosing one factor to the exclusion of the other, adding together the contributions of two factors, or by finding a middle ground between them. Breaking out of dichotomies is so characteristic of the thinking of Wolfgang KÖHLER that I would like to illustrate it in a number of contexts. It is part of his legacy that contemporary psychology has not used, perhaps not understood, sufficiently. I will consider such issues as nativism-empirism, the problem of mechanism vs. vitalism, the dichotomy of value and fact, of explaining vs. understanding.

Nativism-Empirism

When Gestalt psychology first appeared on the intellectual scene, first in Germany, then in America, it criticized the then dominant empiristic theories, particularly in perception. That is, perceptual achievements were explained in terms of inferences, typically unconscious, based on past experience: we see things as we do, so it was argued, because that is how we saw them in the past. Criticism of such empiristic theories is not my present theme; it has been done very well by other Gestalt psychologists. (As will become clear later, such criticisms do not imply a neglect of the influence of previous experience on cognitive and other functions.) Because of such criticisms, Gestalt psychologists were considered nativists. I do not know of any specific writings by these psychologists that were pointed to as nativistic: it seems simply to have been assumed that if one's interpretations were not empiristic, they must be nativistic.

This is a dichotomy that Gestalt psychologists do not accept. In particular, KÖHLER's examination of the meaning of nativism shows that neither inheritance nor learning, nor any combination of the two, is sufficient to account for any psychological effect.

What do we omit when we speak of the contributions of innate and learned factors? It is first necessary to be clear about the meaning of the terms. While "learning" presents no great problems in the present connection, the meaning of "unlearned" is ambiguous. Here I follow KÖHLER's discussion. The unlearned includes innate factors, by which we mean histological features of the nervous system as well as other parts of the anatomy. The chromosomes of the cells of the species (and of the individual) are responsible for these structures; and these chromosomes are the contributions of evolution.

Does evolution, then, together with learning, account for perception, thinking, emotion, and so on? No, says KÖHLER; we have not yet exhausted the meaning of "unlearned." To do so, we may follow his discussion of what evolution can do and what it cannot do (KÖHLER 1950, 1969). Evolution is a unifying principle which accounts for the emergence of living forms from inorganic nature as well as for the changes which permit new species to develop. Since the organic develops from the inorganic, it is a part of nature, a physical system as well as a biological one, and the laws of inorganic nature apply to it too. Evolution cannot change the laws of nature. To reject the relation between organic and inorganic is to reject evolution. The alternative is vitalism or emergent evolution, doctrines which scientists have, on the whole, discarded in favor of a Darwinian perspective, albeit with modern modifications.

If the laws of nature are laws of organic as well as of inorganic nature, evolution contains, as KÖHLER has repeatedly shown, a principle of invariance as well as one of variance or change. It is the dynamic natural processes that are invariant, and they too fall under the category "unlearned." As KÖHLER puts it, "no essentially new kind of action appears in living systems" (1950, p. 292). Evolution introduces constraints, the histology of the nervous system and other structures, which eliminate certain possibilities of action, just as a pipe constrains the flow of water rushing through it; but evolution cannot cause the action itself. "Any action in any organism involves the operation of factors which are entirely independent of evolution" (1950, p. 293). These are unlearned factors, and they are not innate.

More specifically, KÖHLER states that animate and inanimate systems have in common general principles (such as the laws of thermodynamics or the conservation of energy), forces (such as electrical and gravitational fields), and elementary processes (such as electric currents). With these evolution, I repeat, has nothing at all to do; nobody ever inherited an electric current or a gravitational field. If electrical or chemical processes in the brain correspond to perceptual processes, we are considering an aspect of perception entirely independent of learning and of evolution. (fn 1)

Thus there are three factors, not two, which are responsible for psychological processes: invariant dynamics, which organisms share with the rest of nature, innate constraints contributed by evolution, and learning. The nativism-empirism dichotomy has been superseded. KÖHLER summarizes:

Why so much talk about inheritance, and so much about learning - but hardly ever a word about invariant dynamics? It is this invariant dynamics, however constrained by histological devices, which keeps organisms and their nervous systems going. (1969, p. 90)

Mechanism and Vitalism

The same kind of thinking will help us deal with the next dichotomy to be discussed, that of mechanism and vitalism. With the advent of information processing and the computational approach to cognitive and other processes, mechanism seems to me to be the dominant issue confronting modern psychology, an issue for the most part unrecognized as such. Mechanism, or machine theory, to

use KÖHLER's expression, will be used to refer to any attempt to understand psychological processes after the model of a machine, whether it be the automaton of DESCARTES, with its tubes and threads, the old-fashioned telephone switchboard, or the contemporary computer. Of course, mechanistic theories need not model themselves after any particular machine, as in these examples. They may simply rely on the specific characteristic of a machine, the constraints which determine the direction of physical processes. Thus associationists have long considered the course of mental events to be determined by chains of associations corresponding to neural pathways. Ever since psychology set out to become a science, mechanistic theories have flourished because psychologists believed science to be mechanistic. It was simply assumed that nature, left to itself, unconstrained, would produce only chaos, not the order that is so conspicuous in the biological and psychological worlds. With evolutionary theory came apparent support for a mechanistic view of the organism and its functioning; as we have just seen, evolution introduces the necessary constraints in the organism.

Some scientists were not convinced that mechanistic theories were adequate to explain the orderly processes in organisms and in their development. As a single example of the evidence that impressed them, it has long been known that adult spiders will adapt to experimental interventions, such as the removal of several of their legs, and will immediately locomote normally, i.e., without learning. It is inconceivable that the combinations of injuries produced in the laboratory should have been so frequent under natural conditions that evolution could have developed mechanisms to compensate for them (cf. KÖHLER 1938, chap. 8).

Confronted with such instances of order in the absence of evolutionary mechanisms to produce it, some biologists and philosophers postulated a vital principle or entelechy, not subject to the laws of science, which produces order in a nature that would otherwise be chaotic.

It is clear that if one considers natural forces to be inherently disorderly - producing orderly results only if constrained - that is, if one regards nature mechanistically, only then will one think of postulating a vital principle. It is a solution that tries to correct a mechanistic view, with which it shares the assumption that natural forces cannot account for order. KOFFKA has summarized well the relation of mechanism and vitalism: "The mechanist has no better friend than the vitalist" (1938, p. 226).

While the vitalists have pointed out some of the problems of their friends the mechanists, vitalism is unacceptable to most scientists. For one thing, it sets limits to the validity of scientific principles; for another, it leaves unanswered the question of the relation between the mysterious entelechy and the mundane physical processes on which it operates. Today it is unnecessary further to criticize vitalism. (fn 2)

It is clear that, despite their unrecognized affinity, mechanism and vitalism are each an attempt to escape or defeat the other. Must we choose? This is another dichotomy that Gestalt psychology does not accept. As KÖHLER remarks:

Most biologists, physiologists, and psychologists think ... that the order and fitting coordination of processes in the organism is guaranteed by the ... principle of numerous morphological machine connections. If a person does not want to be a vitalist, it seems that he has to be a mechanist; and only very rarely are points of view advanced which in principle represent a third type of approach. (1924, p. 513)

Given the inadequacies of mechanism and vitalism, here touched upon only very lightly, how are we to find a third type of approach? To repeat, both mechanists and vitalists view nature as devoid of order. Must it be so regarded?

I referred earlier to invariant dynamics which pervade nature and which are therefore of as much interest to psychologists as to physicists. Left to themselves, unconstrained or mainly unconstrained, do they produce chaos? By no means. KÖHLER has given many examples of physical systems which, left to themselves, achieve orderly results without benefit of constraints. The heavenly bodies remain in their orbits unconstrained; the free play of the forces of gravitation alone are responsible for their impressive order. In a large body of water, unconstrained at least in its interior, the direction of flow again depends upon the free play of natural forces, their tendency being to produce equalization of pressure. "In general, dynamic interaction within a system tends to establish orderly distributions" (KÖHLER 1947, p. 130). Or again, "For the system as a whole, the immediate effect can have only one direction: all local changes must be such that, when considered in their totality, they bring the system nearer the balance of forces" (1947, pp. 131-132).

The forces of nature, left to themselves, are thus not a matter of, the accidental impact of forces in which anything can happen. Constraints are not needed to produce order. "Dynamic self-distribution is the kind of function which Gestalt Psychology believes to be essential in neurological and psychological theory" (KÖHLER 1947, p. 132). It is true that the nervous system, that part of nature of most immediate interest to psychologists, contains constraints, for example, nerve cells, nerve fibers, and other structures; but in the medium around and between such structures processes occur which are not constrained. To these KÖHLER in particular has attributed special significance for perception and other psychological processes (cf., for example, KÖHLER 1940, 1969).

This discussion has shown that if one does not view nature mechanistically, one is not forced into vitalism. Indeed, vitalism is one refuge of those who do see nature as inherently chaotic. A third position, orderly dynamic self-distribution of natural processes, enables us to avoid both mechanism and vitalism and, as the Gestalt psychologists see it, this is the position that makes psychological processes understandable. And with this Position, KÖHLER has broken out of another dichotomy.

Value and Fact

Psychology is not alone among the sciences in priding itself on being value-free; but the contradiction between science and experience is perhaps most conspicuous and most disturbing in this field. Psychologists, of course, themselves have values: objec-

tivity and truth, for example; they value science itself. Among applied psychologists, such values as mental health, productivity, self-realization, and so on are prominent. And they have personal values less directly related to their own discipline. But by a curious compartmentalization, all of these are held to be distinct from the merely factual realm of scientific psychology itself. (fn 3)

Nobody denies the importance of values, which shape the course of our lives. Although this is not the most flourishing part of our discipline, psychologists have attempted to measure or classify values, have been concerned with their development in the individual, and have done surprisingly trivial studies of value change, and so on. But this work has neither contributed to the analysis of value nor helped to dispel the contradiction that value presents to a value-free science. What KÖHLER calls a degeneration of the study of value (1944) is nowhere more obvious than in the studies to which allusion has just been made, in which values are treated as if they were merely indifferent facts.

Perhaps more relevant to our problem than the psychological studies of values themselves is the field of motivation, which is a flourishing one. Motivation implies value, a positively or negatively valued object or situation demanding action, often from the self. Water says "Drink me" to the thirsty person; the cake says "Eat me." Certainly we are not dealing with indifferent facts in such cases, nor even with facts that have only the quality of positive or negative. Rather, these are situations which make demands, which possess requiredness - the defining characteristic of value. (fn 4) (cf. KÖHLER 1944). Considering problems of motivation, we ask again how psychology can deal scientifically with such values, at the same time maintaining that science is merely factual.

Once again the Gestalt psychologists see a false dichotomy here: the distinction between requiredness and indifferent fact does not coincide with the distinction between nonscience and science. Instead of seeing value as a phenomenon found exclusively in the mental world, KÖHLER looks to nature for processes that share its distinctive character of requiredness. In the case of motivation, he finds one approach. Is there anything in nature that shows behavior like that of the valued object in relation to the self? Certainly there is. The field between two physical objects tends either to reduce or to increase their physical distance, just as a phenomenal object attracts or repels the self (KÖHLER 1944). Presumably the same field action occurs between the cortical correlates of object and self - which are also, of course, a part of nature, that part, I repeat, most closely related to psychological events.

Of course it is no more than inference if we suggest that the brain processes corresponding to motivation behave like other field processes in nature. The problem is that we have no direct contact, no direct knowledge of the cortical correlates of our phenomenal selves and our phenomenal world. Are there cases in which our contact is more direct with entities beyond the phenomenal field? If we can find such cases, do these transphenomenal entities, as KÖHLER calls them, possess requiredness or do we remain in the realm of mere facts? He develops a number of examples, one or two of which I shall borrow. I will simplify them

for our present purposes, stripping them of some of their interesting implications.

The experience of reference is commonplace: this room is larger than that other one; this way home is shorter than that; the sky is bluer today than it was yesterday. In some of these simple cases one object is related to another that is not phenomenally present; but it must somehow belong to the same context as the other or we could not speak of their relation - of size, color, etc. Still; we remain in the domain of facts.

Some references are more demanding: This conclusion follows from these premises; this color clashes with that one. We have seen demands also between the self and some desirable or undesirable phenomenal object. Do we have cases of such reference with demand or requiredness where one term is phenomenally given, the other not? KÖHLER uses the example of immanent recall, which has sometimes been called the "tip of the tongue phenomenon." (fn 5) I try to think of a name I heard recently; I am sure I will recall it, that it will come to me. Thus the reference is between the phenomenal self and some entity not phenomenally present, which we call a memory trace. Let me continue for a moment in KÖHLER's words:

Before a name or another fact is actually remembered there may be a difficulty, a suspense, a delay in its appearance. Nevertheless we may know of the same time that "it is there"; we feel referred, and even referred to the right thing, even though this same thing has not yet emerged into phenomenal existence. ... The reference extends into "darkness" beyond; and yet we feel, from our side, how, over there, it rests an adequate ground.

„Whenever we try to remember in spite of temporary difficulties, some data are given phenomenally which the thing beyond has to fit.... We feel how the phenomenal part of the context bears definite reference to the missing part outside.... It is a particular reference which extends beyond, and its implication is that the thing outside fits the concrete phenomenal context in question. (1938, pp. 117-118)

"Our experience of reference," KÖHLER continues, "to an entity beyond is so definite that we are often clearly aware of fluctuations in the status of this entity" (ibid., p. 118). That is, we find ourselves coming closer, losing it, perhaps again approaching the entity which is still beyond our direct experience, but which may eventually come into phenomenal existence.

In the present connection, the important point is that specific demands arise from this transphenomenal entity, this memory trace; the recalled item must satisfy these demands from "beyond." Requiredness issues from a transphenomenal fact and extends to the phenomenal world. As KÖHLER expresses it, "Acceptance or rejection comes distinctly from the authority 'beyond'; and the self can only ratify what this other agent really decides to say" (1938, p. 276).

We do not know much about the transphenomenal entity which I have called a memory trace. For the present, its specific properties must remain hypothetical. But we do know that it must be some entity or process in the brain which corresponds to a past experience. That means it is a physiological event - a physical-chemical event, a part of nature. Thus we have considered an

example in which demands issue from the realm of nature. The natural world is not a world of mere facts; it possesses requiredness.

Another simple case, again taken from KÖHLER (1938), shows that the example of immanent recall is no isolated instance of requiredness in nature. The beginning of a sentence or of a melody demands completion in a certain direction, rejecting other completions. If I were to start: "This centennial is . . .," an acceptable continuation might be "an important occasion." A completion like "an elm tree" would be unacceptable. The demand for a certain kind of completion again comes from the realm of memory traces, since the first part of the sentence exists only in memory when I arrive at the completion. Again, memory traces - physical or chemical processes in the brain - are the source of requiredness. They demand some completions and reject others. (fn 6)

This discussion has not, of course, been an analysis of value. But it has shown that requiredness, the distinctive characteristic of value, is not confined to the mental world but is found also in nature. Thus KÖHLER has overcome the familiar dichotomy between value and fact, once more by taking a new look at the natural world. Again, a third approach, a new one, has been used to overcome a troublesome dichotomy.

Explaining vs. understanding

One controversy that has existed in our field almost from the beginning, of scientific psychology has been that between an explaining and an understanding psychology. Those we might now call philosophical psychologists looked at the emerging experimental psychology with dismay. A psychology confined to the measurement of thresholds, of reaction times, to the learning of nonsense syllables, and the like could never, they thought, deal with the real problems of human beings living in society. On the other hand, the scientific psychologists believed that their critics, however brilliant their speculations, could never develop a science of psychology, one based on causal relations and on a solid ground of verifiable fact. In those early days when Gestalt psychology arose, the only available solution was to take one side or the other.

Gestalt psychologists were willing neither to sacrifice relevance to major human concerns nor to give up the scientific method. Once again, as one can see in the writings of all three of the founders of this psychology, their solution was to find a third position, thus to supersede the dichotomy. What they did was to re-examine the conception of science then prevailing.

Natural science was regarded by the early psychologists as both mechanistic and atomistic. Their idea, which did have some relevance to nineteenth century physics and physiology, had not kept up with scientific developments in these other fields. The model of the Gestalt psychologists was, rather, twentieth century field theory in physics. They set out to apply this kind of thinking to major problems of psychology and brain physiology.

We have already seen that science, so conceived, can deal with order while dispensing with mechanistic assumptions, and that

value need not be excluded from a scientific psychology, since nature, as well as mental phenomena, exhibits requiredness. Thus the Gestalt psychologists succeeded in avoiding the difficulties that the philosophers criticized in experimental psychology; at the same time they refused to abandon, did not have to abandon, the scientific method. Again KÖHLER and his colleagues had overcome an important dichotomy by taking a new approach. This time what was needed was a re-examination of the method by which nature was studied.

Another aspect of this problem of explaining vs. understanding deserves brief mention. In the natural sciences, relations are established by induction: one set of conditions is varied to observe the consequences for a given system. In this way, causal laws may be established.

A similar procedure is sometimes necessary in psychology. For example, why do we often perceive ourselves as driving faster at night than in the daytime, though our actual speed may be constant? There is a relation between perceived velocity and the width of the visual field through which an object is moving. Such a relation can only be established inductively. But there are other cases in which we actually perceive the causal relation involved. In such cases, data are not perceived as independent facts, but as related events whose causal relations are perceived as growing out of the nature of the facts in question. Such experiences are commonplace. Indeed, KÖHLER's whole discussion of insight derives from such immediate perception of understandable relations (DILTHEY's *verständliche Zusammenhänge*; cf., for example, KÖHLER 1960).

A simple example of insight will clarify this point. I take one from KÖHLER; the discussion is of admiration:

Last night in the concert hall, it was an alto voice which sounded "admirably" serious, calm and confident. Unquestionably, this was the object of my admiration - not the nose of my neighbor, nor the back of the conductor, nor any of the thousands of other objects and events which I had before me. Actually, of course, in this situation I did directly experience, first, that my admiration was related to the singing rather than to any other thing, and secondly, that admiration was the natural answer to such a way of singing." (1947, pp. 323-324)

KÖHLER continues:

As a matter of fact, my experience told me more than any scientific induction could. For induction is silent as to the nature of the functional relation which it predicates, while in the present example a particular fact of psychological causation was directly experienced as an understandable relationship. (ibid.)

As the example suggests, insight, the perception of understandable relations, is an extremely common and natural experience. It also shows again that the dichotomy of explaining and understanding breaks down. For some of the functional relations in scientific psychology are understandable ones. KÖHLER's treatment of insight is thus another example of this characteristic of his thinking, the breaking out of dichotomies.

A final word

Additional examples might have been given to show KÖHLER's tendency to break out of dichotomies. For example, his discussion of the relation of quantity to quality (1938, pp. 149 ff.) might be included. Again, he rejected relativism of values (cf. KÖHLER 1944) but he did not hold that values are absolute. (fn 7)

It must not be concluded from this discussion that all dichotomies are false and need to be superseded. There are legitimate dichotomies, as the law of contradiction implies. In nature, too, there are dichotomies, though probably not very many. But the discussion does suggest that whenever we encounter a dichotomy, it is appropriate to ask: Are we overlooking something? Are we stuck in an old approach that needs to be re-examined? In many cases, I suggest, dichotomies present a problem, not a solution.

Summary

An aspect of the thinking of Wolfgang KÖHLER has been illustrated here, his ability to break out of traditional dichotomies that are false or restrictive. The following dichotomies have been discussed: nativism-empirism, mechanism-vitalism, value-fact, and explaining-understanding. In these and other instances, he shows the dichotomy to be wrong either by showing that something has been overlooked or by re-examining the material to find a fresh approach to it. The tendency to break out of dichotomies is one that KÖHLER shares with other Gestalt psychologists.

Footnotes

fn 1 The careful reader will notice here and elsewhere in this paper the possibility of introducing the hypothesis of psychophysical isomorphism. This Journal has published several articles critical of this hypothesis. Among other aspects that have been neglected in these critiques is its relation to evolutionary theory (cf. KÖHLER 1938, pp. 395f.). It is also important to distinguish the Gestalt concept of isomorphism from different hypotheses, involving different relations that use the same name (cf. HENLE 1984). The arbitrary introduction of homonyms will not clarify matters in science. Most important, the hypothesis needs to be fully understood before it can be either accepted or rejected.

fn 2 Tomorrow such criticism may be necessary. I have the impression that vitalism is beginning to reappear underground in psychology. Given the prevalence of mechanistic theories today and the close relation between mechanism and vitalism, the re-emergence of vitalism seems to me inevitable.

fn 3 In a current issue of a very widely distributed psychological journal I happened to come across this statement: "A tough-minded and clear-headed approach that resists the conflation of facts and values, of the objective and the subjective, can be more useful to achieving 'humanistic' goals than an approach that dictates so-called 'humanistic' values."

And in another current journal I read, again by chance: "On what grounds can a science of facts... end up with normative values? In other words, is there in PIAGET an unjustifiable shift from is to ought?"

- fn 4 KÖHLER uses requiredness as a general term which refers to binding values as well as to ones not so considered - likes and dislikes, for example, and which covers values in the areas of logic, ethics, and aesthetics.
- fn 5 It will be recalled that William JAMES (1890, vol.1, p. 251) used this same example for a different purpose.
- fn 6 These simple examples are taken from the very comprehensive and penetrating analysis in KÖHLER's *The Place of Value in a World of Facts*.
- fn 7 This issue has been discussed at greater length by ASCH (1952), DUNCKER (1939), and WERTHEIMER (1935).

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