

**AGAINST AND FOR HOLISM:
A REVIEW AND REJOINDER
TO
D. C. PHILLIPS***

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INTRODUCTION

Those of us who justify interdisciplinary work by appeal to holism must pay attention to well-made cases against it. D. C. Phillips' case is one. He maintains that holism, taken seriously, can't work.

Phillips sees in holism three distinguishable theses about complex entities and ways of dealing with them more appropriately than can be done by the traditional scientific method. The first, which he calls Holism 1, contends that wholes emerge from the association of their parts and can neither be investigated adequately nor explained by mechanistic analysis. Holism 2 identifies the reality of wholes in powers of organization that cannot be explained by reduction to the properties of their parts. Holism 3 is a call for conceptual terms referring to wholes--a call that sometimes denies that such terms can be rigorously developed under the prevailing scientific image of nature. Certain positive aspects of these theses have merit, in Phillips' view, but their negative claims about the scientific method are untenable. For him, the method itself is so reasonable and moderate that all scientists, even holists, are bound to use it. The futility of holism follows from its efforts to reject a method that it cannot avoid.

The literature of holism is large and difficult because it is expressed, often vaguely, in the specialized jargons of many different disciplines. Nevertheless,

Holistic Thought in Social Science (Stanford, CA: Stanford Univ. Press), 1976, 149 pp.

Phillips presents an ordered account of it that clearly delineates holism's main theses and applications as they have been developed since the mid-nineteenth century in several fields--philosophy, biology, psychology, sociology, anthropology, historiography, political science, and general system theory. His treatment is closely reasoned, carefully documented, and based on a thorough grasp of the doctrines he finds wanting. It is, consequently, worth going along with him to see in more detail what he thinks holism is and has been, what he finds wrong with it, and what's left of it when he's done, it is also worth considering the possibility of a rejoinder to his case. For if his case is logically necessary, holism is not.

THE NATURE OF HOLISM

The Theses

Holism 1 had ancient origins but came to modern prominence following the Romantic movement when it was formulated by certain neo-idealists in philosophy and in biology by the organicists. Done for the most part between 1880 and the later 1920's, this work generally reflects the theory of internal relations developed earlier by Hegel and his disciples: For things to exist as parts, rather than as isolated entities, the wholes to which they belong must also exist. Things connected as parts in a whole have "relational properties" that are different from their characteristics in isolation. Parts and wholes are reciprocally influential, so that neither term can change without altering the other.

From these broad notions, neo-idealists like F. H. Bradley, A. E. Taylor and J. McTaggart derived five more specific ideas that form the philosophical core of Holism 1. First, the analytic method is inappropriate for the study of complex wholes and their parts. Analysis separates parts from the whole in order to investigate them as things in isolation, thereby depriving parts of their relational properties and wholes of their coherence. Second, because relational properties are among the defining attributes of parts, parts cannot be understood as such outside of the wholes to which they belong. Third, wholes are more than the sum of their parts considered as isolates because wholes include the relational properties of their parts. Fourth, wholes determine the properties of their parts in the sense that altering the whole (e.g. by adding, deleting or substituting a part within it) necessarily alters relationships obtaining among parts. Fifth, parts are dynamically inter-dependent in the sense that changes in the properties of any one will change the relational properties of all the others and, consequently, the nature of the whole itself.

Organicists advanced similar ideas in biology, chiefly because they doubted the ability of mechanistic analysis to explain the discoveries about vital processes that were being made on every hand: Evolutionists noted spontaneous variations in individual members of a species that appeared to spread in blended or diluted form among subsequent generations. Microscopists revealed the internal complexity of the cell and its nucleus, making

the already elaborate processes of cell division and reproduction that much more intricate. Embryologists observed that, following tissue excisions, the development process altered so as to nullify the effects of the damage as much as possible. Naturalists pondered the regeneration of lost body parts in some species, and the ability of even simple organisms to modify their activities in relation to varying circumstances.

It was the observed complexity of living things, the intricacy and variability of their processes, that raised doubts. Mechanism insists that natural events can all be explained in terms of basic entities and forces operating determinately in accordance with physico-chemical laws. But what entities would be basic enough? The cell was complex and even its parts had parts. Molecules and atoms seemed too small to contain truly intricate mechanisms; and the forces acting upon them appeared too determinate to account for variability. Rejecting mechanism, organicists fastened on the relational properties of parts to account for characteristics that seemed only to emerge in the functioning of whole organisms and total ecologies. The rediscovery of Mendel's particulate theory of inheritance did not blunt the holistic thrust of organicism, and it was not until Crick's and Watson's time that a fully mechanistic analysis was achieved. Meanwhile, Holism 1 flourished in the work of biologists like the brothers Haldane, R. Virchow, the vitalist Hans Driesch, E. Montgomery, and later, J.H. Woodger, C.L. Morgan, E.R. Russell and W.E. Agar.

In Holism 1, then, organic wholes are identified with their emergent characteristics--attributes manifesting the relational properties that their parts acquire through association. So seen, wholes cannot be explained or predicted from knowledge of their parts alone. For, as Phillips notes, scientific explanations and predictions can always be formulated as deductive arguments which, to be valid, must contain no terms in their conclusions that are not in their premises. Since premises based only on knowledge of parts do not refer to associations, characteristics that emerge from associations cannot be deduced from them.

But this line of argument leaves open the possibility of explaining a whole's emergent characteristics in terms of its parts once the characteristics themselves are known. For the characteristics can be regarded as instances of interaction laws holding for the classes of things to which the parts, taken separately, belong. Such laws, combined with information about parts, yield the very statements of relational properties that are needed to deduce the whole. Organicists may balk at this claim, which is the central tenet of reductionism. But, Phillips insists, reductionists can logically both assert their claim and accept the organicists' view of emergent phenomena--which are, after all, what they, no less than the organicists, intend to explain. Accordingly, he separates the formal rejection of reductionism from Holism 1 and represents it as Holism 2 through arguments developed by the biologist Paul Weiss since the 1920's.

Weiss accepts the basic ideas of Holism 1, but adds that even knowing the interaction laws and relational properties of parts is not enough to explain the

emergent characteristics of wholes. For these characteristics only exist on the level of the intact whole; and parts, which exist on subordinate levels, do not contain information sufficient to describe fully much less to deduce the whole. At bottom, wholes are as real and as much possessed of properties as are their parts. Such properties manifest principles according to which wholes effect the organization of their parts. These principles must be sought on the level of reality at which they operate, and they alone are sufficient to explain the characteristics of wholes emergent at that level.

On these grounds, proponents of Holism 2 challenge the sufficiency if not the validity of analytic method and the doctrine of mechanism—the first because it proceeds by decomposing wholes; the second because it seeks nothing of explanatory significance at the level of wholes. Reductionism is rejected outright because it misrepresents the explanatory problem at issue: Taking the emergent characteristics of wholes as given, reductionists treat them as constituted by and therefore reducible to the properties of interacting parts. For them, the problem is to discover the interaction laws and relational attributes of parts from which given emergent characteristics can be deduced. In Holism 2, the problem is to discover the organizational principles that govern and therefore explain both the whole's emergent characteristics and the interaction patterns of its parts.

Phillips identifies Holism 3 in statements calling for the development of scientifically useful terms that describe the organizational features of wholes, their emergent characteristics, and the relational properties of their parts. This does not require full acceptance of Holism 1 or 2, nor does it conflict with analysis and reductionism. David Easton, for example, has demonstrated the usefulness of treating political life as if it were an open system possessing inputs and outputs, interactions and feedback loops. Such terms occasion descriptions stressing the interdependency of political phenomena and the organizational dynamics by which they operate. But Easton insists that his strategy is essentially conceptual, not an assertion that the system he posits is physically real. In this he breaks with Holism 2, and he goes on to break with Holism 1 by asserting that analysis must follow conceptualization. Analysis is our only means of identifying the real things whose relationships interest us and, consequently, of providing an empirical basis for theories that can explain the phenomena we've described. One need not admit the integrity and reality of wholes in order to make use of concepts about them.

But Holism 3 has been used more ambitiously by proponents of Holism 1 and 2 who want to overhaul the conceptual bases of science: The prevailing image of nature in science reflects the assumptions of analysis, mechanism and reductionism. Hence, nature is conceived as if it were composed of truly elemental things and forces that can be examined separately for their abiding characteristics and explained by the fundamental laws they obey—laws that can also account for aggregates emerging from the interplay of nature's elements. This image should be abandoned and nature should instead be conceived as a

hierarchy of organizational levels so arranged that wholes at any given level can be parts of higher level wholes and have lower level wholes for parts. As wholes become parts of higher level wholes, they acquire new relational properties that are relevant to their operation at that level and non-existent at levels below it. There simply are no relevant matters "more fundamental" than those which exist as a function of the whole in question. So the scientific study of any whole must be guided by conceptions developed for the level of organization at which it is taken to exist.

Phillips points to arguments for this version of Holism 3 in Weiss' work, but he elaborates the thesis primarily in terms of general system theory (GST) and its acknowledged founder, the biologist, Bertalanffy. Rooted in organicism, GST defines its basic object of study, the system, as a complex of interacting components. Wholes are systems, and while wholes must differ substantively at different levels, there are nevertheless general principles that hold for all systems regardless of what their components and binding forces or relations are. It is the purpose of GST to discover these principles and to express them in a "logico-mathematical" formalism that can be used across the sciences to effect the study of wholes as such. There is here no resort to matters more fundamental than the whole itself. Rather, the whole is described and also account for aggregates emerging from the interplay of nature's elements. This image should be abandoned and nature should instead be conceived as a hierarchy of organizational levels so arranged that wholes at any given level can be parts of higher level wholes and have lower level wholes for parts. As wholes become parts of higher level wholes, they acquire new relational properties that are relevant to their operation at that level and non-existent at levels below it. There simply are no relevant matters "more fundamental" than those which exist as a function of the whole in question. So the scientific study of any whole must be guided by conceptions developed for the level of organization at which it is taken to exist.

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Holism In Social Science

Holism is often held to be as important in social science as mechanistic analysis is in physical science. Phillips pursues this claim by identifying resemblances between the holistic theses and several leading ideas about how the behavior of humans should be studied. Since he also uses these resemblances to assign the faults of holism to much that is done in social science, we should indicate what the similarities are--hence, what sorts of ideas are at stake--before considering his criticisms directly.

A fair amount of work in the social sciences is concerned with relationships as proper objects of inquiry that cannot be understood in terms of their parts alone. Interpersonal relationships are a familiar example, and their treatment closely resembles Holism 1: Terms like "spouse" or "credit" assume the relationships "wife/husband" and "lender/borrower" in that "wife" and "lender" do not exist apart from "husband" and "borrower." So, for example, information about women as individuals will not suffice to explain their behavior as wives or lenders because information about their own relational attributes and those of their husbands or borrowers is needed. Likewise, information about both pairs of terms is needed to account for the spousal and credit relationships respectively.

As early as 1884, John Dewey used these essentially Hegelian ideas to characterize "knowing" as a dynamic relationship between knower and known that held for the organism/environment nexus generally. Later, in works done with A. F. Bentley during the 1940's, this imagery was used to delineate a "transactional" approach that the authors deemed necessary for the study of the psycho-social lives of humans: People are organisms whose traits as separate individuals are not the same as the relational attributes they acquire from interpersonal ties. Networks of such ties are the social environment at any moment. Human acts, based on present knowledge acquired from interpersonal ties, manifest the relational attributes of persons. The consequences of such acts are shaped by the networks of interpersonal ties through which they pass. They become the environmental conditions about which humans must learn in order to act again. It is this on-going dynamic connection between the relational attributes of persons and of their societal context that accounts for psycho-social life, not the separate attributes of individuals or of their environment.

Durkheim's argument of 1895, one of the founding ideas of modern sociology, was, like Dewey's, focused on relationships among persons. But his points and purpose were somewhat different. Where Dewey stressed reciprocal influences in the organism/environment relation to account for knowledge, Durkheim emphasized its asymmetry in order to establish the reality of social forces. Individuals can scarcely affect the networks of interpersonal relationships constituting their social environment. But the networks generate pressures that effectively shape the behaviors of individuals. Explanations of these pressures are to be found in the networks that generate them, not simply in the psychological functioning of individuals.

Differences aside, these arguments resemble Holism 1 in that they clearly present networks of interpersonal relations as organic wholes whose parts can neither be separately understood nor used by themselves to explain the characteristics of the whole. As well, they both advance concepts devoted to the study of social wholes--Holism 3. And both are plainly opposed to methodological individualism--a major form of reductionist thinking in the social sciences.

Individualists like the historian J. W. N. Watkins and the economist F. A. von Hayek do accept the reality of emergent phenomena in social life--of institutions, for example, or social structures or cultures that must emanate from enduring relationships among persons. They even grant that partial explanations of some emergents in terms of others are possible, as when inflation is attributed to full employment. But, they insist, full explanation requires such phenomena to be deduced from laws of individual behavior and statements about the properties of specific persons. For social wholes are not physical entities but conceptual constructions inferred from the observable activities of people. As such, wholes cannot be said to have any motive force of their own--the sorts of interests and aims to which explanations of human behavior must ultimately appeal. Nor, for the same reason, can wholes be directly observed and made the subjects of empirical laws that are needed in scientific explanations. Thus resort to individuals is necessary if full explanations are wanted.

As we have seen, Phillips takes this sort of reasoning to be logically compatible with Holism 1. Accordingly, he doubts the sufficiency of organicist rejections of methodological individualism like those advanced by Dewey and Durkheim. For a stronger expression of Holism 2, he turns to the more recent argument of M. Mandelbaum, who declares outright that concepts referring to forms of social organization cannot be completely reduced to concepts referring to the thoughts and actions of particular persons. So, for example, we can't explain in individualistic terms why people who are as individuals different nevertheless behave similarly toward a bank teller, nor why the teller behaves similarly toward them despite their individual differences. At some point we must appeal to the fact that the parties to this interaction are customers and an employee of the bank. That the parties all know this is a psychological fact. But what they know about is a social fact that is necessary to the explanation of their behavior. In effect, societal things and the facts about them are as real and fundamental as individuals and the psychological facts about them. Reductionists reject this reasoning. For Phillips, their opposition is the basis for separating Holism 2 from Holism 1 which reductionists can accept.

Enough has already been said about general system theory to suggest its relevance here. Phillips regards it as little more than a modern restatement of Dewey's ideas. But he does note that the generality of the system concept invites application to a wider range of relationships than those which can be characterized by interpersonal or as having to do with the organism/environment

relation per se. Eastern's use of it in political science, mentioned earlier, illustrates this point as does another example of GST Phillips examines--A. Koestler's discussion of language as a hierarchically ordered system in which initially generalized and implicit intentions emerge, through differentiation, as specific ideas in articulate speech. These examples deal with relations among systemic functions, like information processing, rather than with persons as such. Combined with the references in Phillips' notes and bibliography, they serve to indicate that GST has been associated with all three forms of holistic thinking in the social sciences since the 1950's.

The concepts of structure and function are made vague by a welter of varying definitions and usages in the social sciences. But Phillips clarifies matters sufficiently to show how both concepts may have holistic connotations. Thus structuralists usually argue that human social behaviors are not random but ordered or related--partly in terms of the biological needs they serve, but more importantly by virtue of the sociocultural rules they obey. And while these rules may vary substantively across groups, they are themselves related in ways that are regular enough to be expressed as universal laws. In this argument, "structure" refers to higher level or universal relations that hold as laws for lower level relations--for the rules in a given society that hold in turn for yet lower order relations embedded in the interactions of specific categories of persons.

Different brands of structuralism locate the origins of universal relations differently. In the case Phillips examines most closely--Levi-Strauss' anthropological account of the matrilineal avunculate--they originate in mental functioning that is the same for all people. But structuralists who are differently inclined, say toward economic universal, may argue differently about origins while remaining thoroughly holistic. What is necessary is a focus on total systems of relations as opposed to their elements. Origins aside, the laws of structure can only be discovered where they are actually expressed--in the forms of relations among social categories of persons that comparison shows to be regular across groups. Variations at lower levels of observation can be deduced from (explained by) these laws. Since the reverse is not true, this argument is often used to reject reductionism (Holism 2) and to call for wholesale conceptual reform (Holism 3) along lines that are largely organicist in nature (Holism 1).

The concept of function is commonly used to explain a system's characteristics in terms of how they help to satisfy its needs. Links between characteristics and needs may be intended by a system's members (manifest functions), or not (latent functions). But a functionalist inquirer must have a theory that accounts for the system's needs, and some means of showing that the characteristics in question are the best or only way of meeting them. The inquirer need not assume that all characteristics have functions or that all functions are only beneficial.

Functionalism is often associated with evolution theory, as when a species' characteristics are shown to have been selected from various

possibilities for their effectiveness at meeting particular adaptive or survival needs in a given environment. But functionalists can also use theories which do not posit the usual evolutionary apparatus of variation and selection. So, for example, GST proposes that any self-regulating or cybernetic system "needs" ways of gathering information about its internal and external states, ways of evaluating these states in terms of its preferred conditions, ways of deciding upon and effecting actions that will make its actual states conform to those it prefers, and ways of performing these steps more-or-less continuously. All of this may certainly serve adaptive needs, and many functionalists so argue where the evolution of "intelligence," or "consciousness" or other aspects of high cognitive capacity are at issue. But the key purpose of GST used in this way is to explain the existing characteristics of a system by showing how they meet its theoretically postulated needs.

In either case, functionalist arguments become holistic when they treat needs and characteristics as emergent phenomena deriving from relationships among a system's elements rather than from the elements taken singly. Thus, evolutionary functionalists argue holistically when they invoke the organism/environment relation in order to explain environmental conditions as effects of adaptive characteristics that a species acquired earlier. General system theorists argue in formally similar ways when they explain "feedback" in cybernetic systems as a complex relationship among objects and events external to the system, its sensory receptors, and its ability both to remember its own actions and to distinguish them from the actions of other things.

The difference between these uses of evolution theory and GST points to an important but often overlooked distinction within functionalism and structuralism as well. GST, and theories like it, tend to be concerned with synchronic relations—with the way a system's structural elements and their functions co-act to produce its emergent characteristics at any moment. Causation, and therefore explanation, is sought within the set of relations comprising the system itself, and the law-like results of this approach can be used to account for the prior history and future states of the system provided relevant data are available. Evolution theory, by contrast, is mainly concerned with diachronic relations—with the way prior states of a system determine its present structure and functioning. In this view, causation and explanation are sought in law-like relations obtaining for trains of events, for successive states of the system.

Proponents of the synchronic view, like the philosopher K. Popper and the social anthropologist A. R. Radcliffe-Brown, deny the existence of diachronic laws, asserting instead that the proper interest of historical reconstruction is the specific event. When this case is made in reductionist terms, as it is by Popper, each event is said to have causes that explain it, but there are no laws connecting these causes in regular temporal sequences. Hence, timeless generalizations pertaining to specific categories of events are the basis of historical explanation. Historical inquiry can illustrate the workings of these laws; but, being

particularistic, it cannot discover them or laws of any other sort. Historicists, arguing somewhat holistically along lines suggested by J. S. Mill, regard synchronic laws as derivative corollaries of diachronic laws that do control the succession of systemic states. Indeed, it is one of the purposes of social science to discover the laws according to which earlier states of society produce later ones.

Many holists tend to disregard this distinction and the dispute that goes with it. H. Spencer, for example, explained the presence of chiefs in groups having more than a hundred members both synchronically as a function or organizational necessity and diachronically as the result of an evolutionary law by which all systems move from homogeneous to heterogeneous or differentiated states. Dewey made similar arguments to explain specific psychological functions as systemic necessities at any given time and as evolutionary effects of on-going adaptation. Levi-Strauss regarded the two approaches as complementary ways of doing the same sort of thing. Behind such views is an argument offered early in the 18th century by G. W. Leibnitz that simultaneous and successive causation are continuous. The separateness or independence of things is, in causal terms, illusory at any moment and overtime; the universe is an interrelated unit and must be explained as such. The resemblance between this line of reasoning and the claims of both Holism 1 and the strong form of Holism 3 is evident.

The concern with relations in the study of human behavior takes yet another form in Gestalt psychology, developed by M. Wertheimer, W. Kohler and K. Koffka after 1910. Gestalts are mental unities which represent experienced objects and situations as wholes rather than as collections of separate elements. Perception, for example, is not a mechanical response of sensory receptors to the separate properties of elements comprising a stimulus object or situation: The same elements (say, two spatially separated flashing lights) will be differently perceived (as one light moving between two points, or as two lights flashing successively) depending upon their own relations (like the time interval between flashes) and relations internal to the perceiver (like the coordination of responses of different receptors with each other and with experientially based conceptions). On these grounds, and in keeping with Holism 1, Gestaltists argue that any psychological process must be understood as a relationship of reciprocal influences holding between relations internal to persons and to the objects or situations they experience. Having formed a concept to deal with this matter, Gestaltists manifest at least the mild form of Holism 3.

Such are Phillips' main examples of holistic thought in the social sciences. Certainly his survey is not exhaustive, even when the many cases he mentions in passing or in notes are added to those he examines in detail. But Phillips is, after all, operating as a philosopher interested in the forms and uses of arguments. Typification and criticism, not exhaustiveness, are his goals. Having reviewed his examples, we can turn to his critique.

PHILLIPS' CRITIQUE

Phillips' contention that holism can't work rests on three lines of argument. First, the holists are wrong to suppose that an object can only be understood when all of its properties are known. Second, this supposition has led holists to misconstrue the concerns and capabilities of analysis, mechanism and reductionism with respect to complex entities. Third, the same erroneous supposition admits logical absurdities into holism that deprive it of a method and of the advantages it claims over mechanistic analysis and reductionism. The bases for these claims warrant review.

During the nineteenth century it was common to speak about the "nature" of a thing, as if things had absolute identities that were determined by all of their properties. It was on this basis that holists, particularly the organicists, saw differences of identity in differences of even a single relational property. By contrast, twentieth century discussions of such matters tend to distinguish between the defining and accompanying properties of things. Defining properties grant identity to an object, allowing it to be recognized for what it is. Accompanying properties may be present or absent without altering the identity and recognizability of a thing. Since it is possible for relational attributes to be accompanying rather than defining properties, a thing can retain its identity while being observed apart from the full panoply of its possible relationships. This lends much practical legitimacy to the method of analysis and to explanatory doctrines that depend on it.

The widespread acceptance of this distinction since 1950 reflects the influence of Wittgenstein's ideas about how we use terms to characterize things. A term refers to a cluster or family of characteristics only some of which need be present in a thing for the term to be applied to it. It is the cluster which is defining, and the presence of even different subsets of its elements in several objects allows all of them to be called by the same term. This amounts to classifying nonidentical objects as alike--a decisively analytic move that assigns identity to things apart from the full set of their properties. But since objects classified according to some of their attributes do not lose the rest of their traits merely by virtue of being grouped together, we have here a way of discovering the whole range of characteristics--including the relational properties--possessed by the members of a given class. Because this applies to complex entities, the relational concerns of holism are not lost, and an orderly basis for generalizing about classes of things is gained.

Twentieth century holists, particularly proponents of GST, have continued to suppose that a thing can only be understood when all of its properties are known. Accordingly, they have persisted in the rejection of any method or doctrine that attempts to separate objects for closer study. In Phillips' view, this amounts to a misreading of the concerns and capabilities of analysis, mechanism and reductionism.

Analysis does attempt to examine the parts of complex systems separately in order to discover their properties in isolation. But the separating is not done to ignore the whole, which must be taken to exist by anyone who bothers to separate its parts. Rather, it is done to identify the defining features of objects serving as parts and to determine values for them which can be assigned as initial conditions to variables specified in laws. Laws express the general form of relationships between defining properties of classes of objects. Hence, they provide a basis for deducing hypotheses about specific relationships between specific objects which can be either explanatory or predictive depending upon whether they refer to phenomena that are already known or yet to be observed. In either case, the hypotheses deal with relationships which are, presumably, not different from the relational properties that Holism 1 invokes to explain the emergent characteristics of wholes.

Analysis, then, is a method of gathering data that is meant to be used with laws to account for systemic phenomena. Mechanism is an allied explanatory doctrine that attempts to identify these laws in relationships holding among the physicochemical properties of basic entities and the forces operating upon them. It then proposes to account for more complex or higher order phenomena by showing them to be combinations of these same basic entities and forces that come together according to the same fundamental laws. There is no lack of concern with complex entities, but an effort to explain them.

Reductionism, another explanatory doctrine, attempts to show that law-like statements referring to complex entities can be reduced to—i.e., deduced from—laws pertaining to fundamentals. The "fundamentals" need not be the basic entities and forces of physics and chemistry, as in mechanism, though they may be. Rather, they must be things possessed of characteristics sufficient to effect events. So, for example, reductionists might insist that law-like statements referring directly to a complex phenomenon like acculturation can be reduced to laws of individual behavior because it is people with different habits, not cultures as such, whose interactions effect the process. Significantly, reductionists do not necessarily deny the existence of irreducible facts about complex phenomena, nor do they object to their inclusion in explanations. Instead, they place these facts in the minor premises of arguments that have laws about fundamentals as their major premises. It is the purpose of these arguments to deduce such regularities as have been observed for complex phenomena, not to ignore them.

In sum, analytic method and the explanatory doctrines of mechanism and reductionism are plainly concerned with complex entities. They have also been able to deal with such entities effectively. As examples, Phillips points to the behavior of gases, electrical fields, thermodynamic events, and genetic inheritance. All are complex phenomena, and all have come to be understood through analysis, mechanism or reductionism despite the frequent claims of holists that this could not be done. So, Phillips argues, there is no reason to believe that in principle these approaches will not continue to solve problems

which seem beyond us at present--even problems of the sort that holists claim only their approach can handle.

To present the absurdity contained in holism, Phillips invokes an argument advanced by William James and Bertrand Russell against the Hegelian doctrine of internal relations: If all things are related, and if relational properties must be known for a thing to be understood, then we must know everything in order to know something. Hence, we can never know anything at all. Let us examine this point further.

Suppose we wish to understand a complex entity E composed of three elements A, B and C. According to Holism 1, E emerges from the relational properties of its elements. Hence, it is pointless to examine A, B and C separately because the relational properties of these elements will be missed. Nor will it do to examine the subsidiary combinations AB, AC, and BC since AB is affected by C, AC by B, and BC by A. In effect, nothing will do to understand E save understanding ABC. But this is the same as saying that E can only be understood by understanding E, a fully circular argument.

In order to break this circle, some holists grant that elements and subsidiary combinations may usefully be studied as a way of determining the relational properties needed to explain emergent characteristics--so long as the latter are the primary objects of inquiry. But this is, as we have seen, what analysts, mechanists and reductionists do when they treat relational properties as initial conditions to deductive arguments that account for the same sorts of phenomena. To make this concession, is to grant that holism has no method of its own--it must resort to analysis to get data--and that it lacks the advantages claimed for it regarding the explanation of complex entities.

Proponents of Holism 2 attempt to avoid these difficulties by constructing the explanatory problem differently. The goal is not to explain E in terms of the relational properties of A, B and C. Rather, it is to explain these properties by appeal to the principles according to which the organizational power of E operate. But this supposes that E itself can be isolated from the yet more complex systems to which it belongs. Mechanists and reductionists do make this analytic assumption, but serious holists cannot without violating an essential premise of their position. If all things are related, and E is a thing, then it must have relational properties that are necessarily missed when it is examined in isolation. Again, either everything must be known in order for anything to be understood, or holism has no way of working that isn't used by those it attacks.

The strong form of Holism 3, being an extension of Holism 1 and 2, has much the same difficulties. But, because it is presented as a call for conceptual reform, it includes an additional source of trouble. If the images invoked by Holism 3 are purely conceptual, they can hardly be said to have physical powers of organization. At some point, reference must be made to real things. But if real things really are embedded in a hierarchy of relationships, then none of them can

be understood outside of the whole to which they belong--which is to say, again, that the entirety of nature must be known before its parts can be understood. The mild form of Holism 3 escapes these problems by granting the legitimacy of employing analytic, mechanist and reductionists strategies in the empirical pursuit of holistic conceptions. But this, of course, is only to grant again that holism as such has no way of working of its own and no advantages over analysis, mechanism and reductionism.

Virtually all of the uses of holism in social science must fall by the same arguments: Dewey is compelled to grant the usefulness of information about individual objects. Neither Durkheim nor Mandelbaum can reject reductionism logically by arguments that require the very sorts of information from which reductionists can also deduce emergent social phenomena. GST is unable to specify its subject matter and make predictions about it without engaging in the same separations of objects that its central premise rejects. Holistic versions of structuralism, functionalism, historicism and Gestaltism are in the same boat. All of them must either be immobilized by their assumptions or resort to analysis and do what their opponents do too.

Plainly, Phillips' critique is an espousal of the positions that holism rejects. Holism has solved no problems not solved as well by analysis, mechanism and reductionism; and problems that did for a time resist solution by the latter approaches also eluded holism. In this sense, holism is as unnecessary as it is unworkable--holists must either resort to analysis or accept the absurdity of needing to know everything in order to know anything.

In a postscript, Philips briefly identifies those features of holism which remain acceptable under his critique: The holists have raised pertinent questions about ways of investigating organic wholes and about the effects of analytic decomposition upon such inquiries. They have rightly called attention to the importance of dynamic relations between parts and to the difficulties of predicting the emergent properties of wholes. And they have been right to call for the development in science of concepts referring to wholes.

These are substantial concessions. But Phillips grants them, taking his critique to have dismissed those points of holism which are antithetical to traditional science--the rejection of analysis, mechanism and reductionism; the ideas that the whole determines the nature of its parts and that the nature or identity of an object consists of all of its attributes, including all of its relational properties; and the call for a total reconceptualization of nature in holistic terms. In his view, what is left when these points are gone is safe.

REJOINDER

Phillips' critique can be answered in ways that argue for the continued use of holism both generally and as a justification of interdisciplinary work.

The critique brings three charges against the central holistic idea that all of an object's attributes must be known for it to be identified and understood: (1) The idea is unwarranted in view of the distinction between defining and accompanying properties. (2) It is therefore not a sound basis for doubting analysis, mechanism and reductionism as ways of studying wholes. (3) Given the companion claim that wholes determine the nature of their parts, the idea leads to absurdities--to circularity and either to the contradiction of accepting analysis or to the impossible situation of needing to know everything in order to know anything.

To answer these arguments we shall have to show that the challenged idea is in some sense necessary, that it does give holists a proper basis for their doubts, and that it need not lead to absurdity. Our claims can best be developed in the light of Phillips' charges.

He argues first that objects can be recognized in different contexts because some of their properties are fundamentally unaltered by movement in and out of particular relationships. Inquiry and explanation can proceed on the basis of these defining properties without full knowledge of all the accompanying characteristics an object can get from relationships in various contexts. The holists are consequently wrong to insist that all the properties of an object must be known for it to be identified and understood.

But nothing in this argument denies that an object's relational properties must be known for it to be identified as a part of some whole. By themselves, the properties of objects which are not altered by relationships provide little information about the properties which are. The traits which identify a person as a man in any context do not indicate whether he is an American in Boston or an American in Paris. While traits of the latter sort may only be accompanying attributes, they serve to specify the sense in which an object is part of some whole, in this limited way, at least, the holist's claim contains an element of necessity even if its global form is wrong.

Phillips argues next that the holists are wrong to doubt the concerns and capabilities of analysis, mechanism and reductionism with respect to the study of wholes. Analysts do seek the properties of objects in isolation, but only in order to specify the initial conditions for arguments using laws to identify parts and to account for wholes. Mechanists seek laws about basic objects and forces which, along with analytic data, can explain the composition of wholes. Reductionists attempt to show that the properties of wholes can be deduced from the properties of their parts and laws pertaining to their interactions. In these respects, holism is not only wrong--it is unnecessary.

These arguments do indicate attention to wholes. But if it is attention not focused on relational properties, it must surely produce understandings rather different from those entertained by holists. Either this or the attending analysts,

mechanists and reductionists must be tacitly accepting tenets of holism that Phillips rejects.

Insofar as analysis seeks the isolable properties of objects, it cannot be regarded as providing information about their relational properties. The seeking itself is certainly in line with the main purposes of analysis--describing a system's initial conditions in order to determine (1) the identity of its unknown components by showing that they behave like objects specified in laws, or (2) the applicability of laws by showing that they correctly represent the behavior of system components which are known to be like the objects they mention. Such purposes require knowledge of isolable properties because it is in terms of them that objects are identified or defined in laws. It is true, of course, that these properties affect the relational characteristics that objects acquire in given contexts. But it is likewise true that isolable properties, being independent of particular contexts, are different from relational properties which are context-dependent.

These points about the analytic study of objects as system components pertain as well to the study of systems as such. The analysis of a system requires it to be isolated--unaffected by factors not being considered explicitly. Without isolation it cannot be told whether factors identified in laws are those responsible for the system's observed behavior. This is why analysts invoke assumptions like ceteris paribus or mutatis mutandis and try to control their subject matters by physical or statistical means. It is partly because holists doubt that an object or system can be both isolated and known that they question the effectiveness of analytic method. But their larger doubts are based on the idea that the analytic search for properties in isolation leads away from relational properties.

It would be wrong, however, to insist that there is no way of using analytic methods to discover the relational properties of parts. By systematically observing an object in different contexts, we can determine which of its characteristics remain the same and which alter, hence which define its identity as a separable object and which define its identity as a part of each context, in effect, contexts are used as independent variables in an essentially descriptive process of inquiry.

Admittedly, this procedure is not analysis in the usual sense because it involves no laws. But it does use the analytic method of manipulating some variables to see how others behave, and it does lead to knowledge of the isolable properties of objects. That it also yields knowledge of relational properties must be counted as something of an advantage. However, to gain this advantage it is necessary to regard the contexts or independent variables as wholes and to know them fully in advance. Otherwise we should not be entitled to treat the altering properties of objects as relational properties of parts, and we should not be able to specify the contextual differences involved.

Accepting these conditions amounts to accepting at least one of two holistic tenets which Phillips rejects—that wholes (the differing observational contexts) determine the relational properties of their parts, and that the whole must be known for its parts to be understood. Regarding the first tenet it may be objected that, since it is not the whole but only some of its properties that are varied in order to create differing observational contexts, it is not the whole which determines. To raise this objection, however, is to invoke the second tenet by claiming knowledge of the whole—in this case, that it has specific properties which can vary while the rest remain constant.

Phillips circumvents these issues—the analytic emphasis on properties in isolation, and the tacit acceptance of unwanted tenets—by placing relational properties in the province of laws. Laws do state the forms of relationships holding between properties of objects. But since these forms must remain the same in different contexts in order to be law-like, it is reasonable to question whether they can always be found for relational properties which are context-dependent. This question can be raised about the use of laws in both mechanist and reductionist treatments of wholes.

Mechanist laws express the regular forms of relationships between defining properties of basic entities and the forces which affect them. The entities mentioned are basic in the sense of being elementary units from which a wide variety of things more complex than themselves are made. Their properties must be defining in the sense of being stable enough to permit entities of the same class to be recognized in different contexts. The forms of relationships between these properties must be regular in the sense of remaining the same in different contexts. The specific values of these properties, like the values of forces operating upon them, vary with surrounding conditions. But the categories of properties and the forms of their relations must remain the same in all contexts if information about them is to have explanatory significance.

It is the apparent restriction of mechanistic laws to defining properties and fixed relationships which brings holists to doubt their appropriateness for the study of wholes. The parts of complex systems, even when they are basic entities, display properties that are not among the defining attributes assigned to them in mechanistic laws and that are consequently not covered by the relationships advanced in such laws. Holists address this matter by supposing that objects, even basic entities, acquire properties from their association with each other where "association" refers not only to the collection of objects present but also to the manner in which they are organized. These are relational properties, of course, and it is because they do not always appear in mechanistic laws that holists have doubts.

Phillips doesn't dismiss this matter. Rather he considers it in terms of two tenets of holism which he takes to be fully compatible with mechanism—that concepts of wholes facilitate discussion of the properties of complex systems, and that the parts of a whole are dynamically interdependent. Thus, confronted

with properties not anticipated in the laws they are using to examine a system, mechanists ordinarily suppose that a more complex theory is needed. Such theories are constructed so as to take more variables into account. Fundamentally, the system is reconceptualized to include more entities, hence more interdependencies affecting its operations. This move is rather like the holistic strategy of treating one whole as part of another. For it to remain fully mechanistic, the additional variables must still be defining properties of basic entities with law-like relations from which the problematic properties can be deduced. Otherwise it would be just as plausible to argue, as holists do, that associations between basics impart relational properties to them which are different from the properties mechanists take to be defining.

It is wrong to argue, as some holists do, that the mechanistic approach to this matter is in principle impossible. As we have seen, Phillips is able to point to cases in which it succeeded. But these successes are likewise no basis for claiming in principle either that the mechanistic approach will always succeed or that the holists must abandon their alternative approach. Rather, it would seem, the holists are entitled to their alternative and to their doubts--the first because mechanists come very close to using it in their own approach; the second because mechanistic laws are not designed to take context-dependent relational properties into account directly.

A somewhat similar point applies to the reductionist claim that the properties of wholes can be explained by deducing them from the properties of parts pertaining to their interaction. If the term "parts" is taken literally, this claim suggests that the premises of reductionist explanations must include information about relational properties. Such information could certainly be placed in statements of initial conditions. But since initial conditions specify the values of variables identified in laws, the interaction laws would then have to contain terms for relational properties. Moreover, in order to be laws, they would have to express forms of relationships holding between these properties across contexts.

What holists may reasonably doubt in this approach is the idea that law-like propositions holding across contexts can always be formulated for relational properties which are context-dependent. Again, this doubt should not be held as a matter of fixed principle since some relational properties, like distance in gravitational systems, are regular enough to be handled in this way. But the doubt is not unfounded when dealing with objects much affected by their contexts. Holists deal with this matter by taking context into account explicitly--by treating the whole as context to its parts and supposing it to have properties of an organizational nature that affect them. But this option is closed to reductionists insofar as their program requires deducing wholes from the properties of their parts. With respect to this requirement, at least, holists are entitled to their doubts about reductionism.

Nothing in these arguments denies the value of mechanistic analysis and reductionism as ways of investigating and explaining natural phenomena. Rather the arguments assert that because these approaches are concentrated upon properties of objects which either remain the same or vary determinately across contexts, they do not always deal effectively with context-dependent characteristics. It is with respect to their focus on defining properties that laws advanced by mechanists and reductionists differ from those suggested in holistic versions of structuralism and functionalism. In effect, holists emphasize the fact that objects identified as the same in terms of their defining properties can display altogether different relational properties depending upon how they are organized. This emphasis does imply that the organizational characteristics of wholes determine the relational properties of objects considered as parts. And the implication does lead directly to the claim of absurdity.

The charge of absurdity asserts that two tenets of holism--wholes determine the nature of their parts, parts are identified by their relational properties--lead to circularity and either to the contradiction of accepting analysis or to the impossible situation of needing to know everything in order to know anything.

The tenets are held to be circular because they can be taken to mean that the whole determines itself. This interpretation follows from the claim that "whole" and "nature of its parts" are the same things. More specifically, "whole" refers to the full set of relations obtaining among the objects which are its parts; and "nature of its parts" refers to those properties of objects which, deriving from their relations with each other, identify them as parts. By these definitions, a whole is not itself without all of its parts, and no object is a part without the relational properties it gets from the whole. Accordingly, "whole" and "nature of its parts" refer to the same things and the tenets assert the circular argument that the whole determines itself.

A different interpretation is possible, however. To begin with, insofar as "nature of its parts" refers specifically to the relational properties of objects determined by the whole, the reference need not be taken to imply that such objects have no other properties--properties that are not determined by the whole but that do influence what relational properties the whole can effect. In this sense, the whole does determine the nature of its parts, but it does not completely determine itself.

Consider, for example, a barnyard population of hens which, as a whole, is arranged into a dominance hierarchy. The whole need not be seen as determining all the properties of each bird which make each a hen. It need only be seen as determining the relational property of position in the hierarchy that each bird has. In this sense, the whole does determine the relational properties or "nature" of its parts, But insofar as the parts have properties affecting their "natures" that are not determined by the whole--as being a hen affects inclusion

in the hierarchy without being determined by it--the whole does not determine itself.

It is true that the relational properties of all the parts must be known if the whole is to be specified or known. This may seem to constitute a circle insofar as "whole" and "relational properties of all the parts" are taken to refer to the same things. But it must be recognized as well that the whole has properties not possessed by any of its parts. Specifically, the whole has organizational characteristics that are not identical to the relational properties of any of its parts.

Suppose, for example, that our dominance hierarchy of hens is organized so as to be completely transitive and irreversible. We may say of this organization, in purely formal terms, that one of its members must dominate all the others, that one must dominate none of the others, that each of its remaining members must dominate some but not all of the others, that none of its members may dominate its dominator or its dominator's dominator and so on. While it is true that every hen in the population must have some relational properties corresponding to these characteristics of the whole, it is also true that no member has all of them. In this sense, "whole" and "relational properties of all the parts" do not refer to the same things.

By dealing with particular wholes, these arguments and examples may seem to beg the larger questions embedded in the charge of absurdity: If the whole determines the nature of its parts, and the entirety of nature is itself a whole, then parts can hardly be said to have properties not determined by the whole--unless we wish to invoke extra-natural causes. This is so, but it is also true that the whole of nature has organizational characteristics not possessed by any of its parts. Thus, even in this extreme case, holism need not be regarded as completely circular in that "whole" and "nature of its parts" do not refer to the same things.

But even if holism isn't circular, its commitment to the image of nature as a whole brings the "contradiction" and "impossibility" issues to bear: if nature is a whole, then the study of any of its parts by itself--for example, the study of a particular whole--amounts to acceptance of the analytic strategy of examining objects in isolation. Holists reject this strategy because it deprives parts of relational properties which must be known if the whole is to be understood. The study of particular wholes therefore contradicts the grounds on which holists reject analysis.

Holists do single out and investigate particular wholes. But it is not clear that in doing so they either accept analysis or contradict the grounds on which they reject it. For one thing, holists need not accept the analytically necessary practice of identifying their subject matters by likening them to objects specified in laws. We have already seen why, according to Phillips, analysts must do this. By contrast, holists may identify their subject matters conceptually, as Phillips approvingly indicates that Easton did by likening political life to the concept of an

open system. Or they may do this empirically on the basis of practical experience with complex systems, as Phillips indicates rather less approvingly than Weiss did. Neither of these approaches is bound to suppose that the systems they single out for study exist or operate apart from the contexts in which they occur. For neither is primarily bent upon using laws in the mechanist or reductionist manner to identify and explain their subject matters. In this sense, the "singling out" of holism is not tantamount to accepting the "isolation" of analysis.

Nor do holists investigating a particular whole have to accept analytic procedures as a suitable way of delineating the relational properties of its parts. Analysts proceed by manipulating or controlling some variables to see how others behave, where the variables are values of defining properties of objects specified in laws. Their results are statements about the form and extent of covariation between some properties of some objects. Such statements do provide a basis for determining whether the observed covariations are like those posited in laws. But they do not necessarily give information sufficient to determine the relational properties of objects considered as parts. The latter, being context-dependent, may not even be mentioned in laws, and they are in any case derived from a part's association with all (not one or another) of the other parts arranged in a particular way.

So, to return to our barnyard example, the relational property of position in the hierarchy can only be stated for a given hen in terms of her dominance relations with all the others. Thus, in order to say that a hen is the eighth in a population of seventeen, we must observe that she is dominated by seven others, that she dominates nine others, and that the two sets have no members in common. Indeed, since the hierarchy itself cannot be specified until the dominance relations of each hen with every other one are known, it is necessary to have observations similar in form for every hen. Statements reporting such observations identify a property for each hen that is her relation to every other hen in the context under study. They are in this sense different from analytic statements reporting covariations between some properties of some objects which can have the same form in different contexts.

It is true that formal analytic questions pertaining to the whole are possible. So, we can usefully ask whether position varies with size or age; or whether dominance position observed for one behavior, say feeding, holds for other activities like breeding; or whether position correlates with particular conditions like health of the member or survival rate and dominance position of her chicks, etc. But it is equally clear that such questions make no sense apart from prior knowledge of the whole. Statements reporting the relational properties of each hen are a basis for making inferences about the organizational characteristics of the whole population. Statements about the organization of the whole do contain implications about the properties of its parts, including some that can be analytically ascertained. But neither sort of statement is based entirely on information of the kind that analysis ordinarily provides. And since they are of logically different types, the statements are not circular.

Even if holists need not accept analytic means of identifying and investigating particular wholes, they may be seen as engaging in contradiction insofar as they study particular wholes at all: If the entirety of nature is a whole, then to study any particular whole by itself is to study a part without reference to its relational properties. This is the very practice for which holists reject analysis.

Holists would be engaging in this contradictory practice if they treated knowledge of a particular whole as an adequate basis for understanding it as part of some other whole. That holists do not do this is perhaps best indicated by the fact that Phillips criticizes them severely for doing the opposite--for insisting that knowledge of an object's properties in isolation is not sufficient to predict the properties it will acquire upon entering relationships with other entities. The criticism is telling since such predictions can sometimes be made: Phillips cites, for example, predictions about the properties of materials under as yet unobserved conditions. But there are also significant instances in which such predictions cannot be made, as when the evolutionary consequences of a species' entry into a new environment cannot be fully anticipated, even when a great deal is known about each term separately. This sort of difficulty, which Phillips acknowledges in his concessions, suggests that the holists have at least got a point. By insisting upon it, they avoid practicing what they preach against themselves.

This line of argument can be used to answer the charge that by rejecting analysis holism accepts the impossible requirement of needing to know everything in order to know anything. In effect, holists need not deny that knowledge of objects in isolation, including knowledge of particular wholes, is knowledge of something. Rather, they must assert that such knowledge is an inadequate basis for knowing objects as parts because it lacks information about the relational properties they get from inclusion within a whole. The process of acquiring this sort of information is as sequential and therefore as possible as any other process of inquiry. What holists maintain about this process is that its constituent steps do not produce settled information. What is earlier known is subject to modification by what is later found out--sometimes because the earlier information was wrong; always because it was incomplete.

We may see this matter more clearly by adapting one of Phillips' points. In discussing methodological individualism he notes that it must always have more advantages than holism. While individualists regard holism as an insufficient basis for explaining social phenomena, they can both accept its findings and then attempt to reduce them to fundamentals. These advantages press toward simplicity and generality. What we have been suggesting about holism is that it has similar advantages in the opposite direction. Holists regard analysis as an insufficient basis for understanding objects as parts. But they can certainly accept its data and their own findings about particular wholes as information relevant to the question of what relational properties objects can have as parts. Given this information, holists can then attempt to discover how the objects in

question are affected by their incorporation into wholes. These advantages press toward complexity and completeness. They are as many and as valuable as the advantages of reductionism, and they are as possible to pursue--if it is realized that the pursuit is sequential and qualified by the understanding that even knowledge of particular wholes is incomplete insofar as it is gathered without reference to their status as parts of other wholes.

So long a rejoinder needs summary of its main points. There are five:

1. Holists may have been wrong, or at least overzealous, to equate an object's identity with all of its properties. But they are right to insist that the relational properties of an object must be known for it to be identified as a part of some particular whole.

2. Holists may have been wrong to insist that analysis, mechanism and reductionism cannot contribute to the understanding of complex entities. But they are right to maintain that these approaches, being focused on the law-like behavior of basic or fundamental entities in different contexts, are not apt to produce information about relational properties in given contexts--information that is needed to identify objects as parts and to make inferences about the organizational characteristics of wholes.

3. Holism is not absurd in the sense of being circular. The idea that the whole determines the nature of its parts need not be equated with the circular claim that the whole determines itself. The key terms "whole" and "nature of its parts" do not refer to the same things: Wholes have properties not possessed by any of their parts. Objects have attributes other than the relational properties which identify them as parts of a particular whole--attributes which are not themselves determined by that whole but which do influence what relational properties the whole can effect.

4. Holism is not absurd in the sense of contradicting itself by rejecting analysis and then using it in the study of particular wholes. Where analysts must use laws to identify their subject matters, holists may use conceptual schemes or practical experience. Where analysts proceed by manipulating some variables to see how others behave, holists proceed by describing the relational properties of each part in terms of its association with all the others. Where analysts assert, holists deny that knowledge of any object's properties in isolation can account for its properties as a part of some whole.

5. Holism is not absurd in the sense of being impossible to use. Since it is not contradictory for holists to study particular wholes, their doctrine does not entail the unworkable view that everything must be known for anything to be known. Holists can grant that knowledge of a particular whole is knowledge of something. However, they must insist that this knowledge is partial or incomplete insofar as it lacks information about the relational properties that whole would acquire as part of some other whole. In this sense, holism does not impede the

acquisition of knowledge. Rather, it warns about the nature of the knowledge we may have at any point.

CONCLUSION

The form of holism which emerges from this discussion is less sweeping than the one which Phillips attacks. This reflects the fact that his arguments are well-wrought and telling. Nevertheless, our version retains some important points of holism which Phillips would dismiss, and it does tie these points to features of the doctrine which he accepts. It is in this sense that our version supports the continued use of holism, not as an adjunct to analysis, mechanism and reductionism, but as a distinctive and useful approach to science in its own right.

One characteristic of this approach--its opposition to the use of partial knowledge as if it were complete--is particularly relevant to the justification of interdisciplinary work. We can consider this matter briefly by way of closing.

It may be said, of course, that the opposition is truistic. More is the wonder, then, that we so often act to the contrary by using avowedly partial knowledge as a basis for acting toward wholes, in the social sciences, for example, human lifeways are commonly regarded as far too complex to be studied as intact wholes. This view is embodied in the practice of specialized disciplines that investigate various aspects of human activity separately. Few specialists deny that the results of their efforts are necessarily partial. But few also act as if what they know about aspects of behavior examined separately would be markedly different were those aspects to be examined together in the context of particular wholes.

Holists have no special reason to reject the practice of disciplines, and it is not surprising that major figures like Durkheim, Levi-Strauss and Piaget are associated with specific fields. But given their views on the importance of relational properties, holists do have reason to doubt that what is known about aspects of behavior taken separately would remain the same were they taken together. It is in this sense that holism helps to justify interdisciplinary work in the social sciences--work which has as its central purpose the discovery of relations among aspects of behavior that are usually studied separately in different disciplines.

The holistic approach to interdisciplinary work involves more than the study of interactions among various aspects of behavior. To be sure, the notion of relational properties assumes that interacting objects affect each other and bring about consequences not attributable to the objects taken separately. But holism calls attention as well to matters of organization--to the idea that interactions may be as much affected by the way that interacting objects are arranged as by what they happen to be. This puts a premium upon communication among interdisciplinarians working on altogether different

phenomena. Concepts of organization may be highly transportable across subject matter domains. They may consequently call attention to factors affecting interactions that a substantive or topical approach to interactions may overlook.

Occasions for interdisciplinarians to talk with each other because they are interdisciplinarians, rather than because they have common topical interests, are as yet rare. Groups which generate such occasions, like the Association for Integrative Studies, are thus not just welcome--they are needed.