



Konopka, Adam: *Ecological Investigations: A Phenomenology of Habitats*

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Adam Konopka's book, *Ecological Investigations: A Phenomenology of Habitats*, is a well-documented study analyzing the philosophical commitments underlying the two dominant schools of plant ecology in the first half of the twentieth century, the Nebraska and the Chicago schools. This book, which is comprised of five distinct investigations, provides a rich historical analysis of the logics of plant habitat associations and the historical development of ecology as a science. However, Konopka goes beyond the merely historiographic to articulate an innovative new phenomenological approach to ecological form. Working at the boundary of geography, ecology, and philosophy, these investigations will reward careful study by theoretical ecologists, historians of science, and philosophers, particularly those who have an interest in the work of Edmund Husserl.

The five investigations which comprise this book exhibit, at once, two complementary lines of inquiry, one genealogical and the other analytical. For historians and those ecologists seeking to understand the development of ecology as a science, Konopka's text offers a nuanced historiographic resource. His genealogical investigations provide excellent articulation, first, of the central premises of early twentieth century plant ecology and, second, of theoretical developments occurring in the nineteenth century that informed this new science. Konopka's carefully researched studies serve, then, to clarify many presuppositions underlying contemporary debates in community ecology regarding the nature and character of ecological systems and debates in population ecology regarding causal interactions at various scales within ecological systems. For this reason, his investigations are not mere historiographies, but rather "historically sensitive analyses of persisting philosophical issues in the philosophy of ecology" (p. 9). The latter three chapters of the book build upon the results obtained in the earlier genealogical investigations. It is

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in these later chapters, particularly, that Konopka develops his own phenomenological approach to ecological form, an approach that relies heavily on Husserl's *Logical Investigations* and *Formal and Transcendental Logic*. In the most original sections of his book, Konopka brings to bear "resources from this phenomenological tradition, especially Husserl's theory of intentionality, logic of part-whole relations, and distinction between formal and regional ontology in an attempt to strengthen epistemological realist approaches in population and community ecology" (p. 78). This new approach is as unique within phenomenology as it is within the philosophy of ecology. One thus finds in Konopka's text refreshing disengagement with interpretations of Husserl's writings in favor of the application of his insights to new domains.

As noted, Konopka divides his book into five distinct chapters or "investigations"—minus the introduction and conclusion. The first two of Konopka's investigations are the most strictly ecological in theme. Both chapter one, "Varieties of succession: a genealogy of twentieth century plant ecology," and chapter two, "Logics of habitat fitness: a genealogy of nineteenth century plant geography," analyze the logics of form at play in early ecology. Taken together, these first two investigations explicate the logic, first, of the physiographic account of plant succession advanced by Henry Chandler Cowles, founder of the so-called Chicago school of ecology and, then, of the physiognomic account articulated by Frederick Clements, father of the Nebraska school.

In his first chapter, Konopka examines three case studies to explicate early twentieth century plant ecology. First, he details Henry Chandler Cowles' studies of Lake Michigan sand dune succession, wherein the theoretical stance of the Chicago school of ecology is articulated. Second, he takes up Frederick Clements' account of prairie succession, which defines the Nebraska school. The two schools differ in their conception of the unity that determines plant associations. Where the Chicago school understands plant communities to be aggregations of individuals, in which "egoism reigns supreme" (p. 22), the Nebraska school, on the contrary, holds that plant associations at the community level have a unity analogous to that of a biological individual. This tension between the two schools, wherein ecological form is thought to be either an aggregate of individualistic entities or a unitary organism, lies at the heart of early ecology and, thus, of Konopka's book. However, no account of the history of ecology in the first half of the century would be complete if it did not detail Raymond Lindeman's "decisive methodological breakthrough in twentieth century accounts of succession" (p. 40). Lindeman's analysis of trophic behaviors in lake ecosystems by which he established the bioeconomic conception of organic relations, which he published in four papers in 1941 and 1942, thus constitutes the third and final case study of this first investigation.

In the second chapter, Konopka retrogressively traces the origins of the individualistic and organismic theories of plant association to nineteenth century sources. Of the two first chapters, then, this second investigation is most genuinely genealogical. Here he demonstrates that Frederick Clements' organismic account of ecological form supposes the physiognomic account of plant form by Alexander von Humboldt in the nineteenth century. Conversely, he traces Henry Chandler Cowles' individualistic theory—and, by extension, Raymond Lindeman's bioeconomic model of organic relations—to the work of Eugenius Warming's

nineteenth century physiographic account of growth forms. “The search for an ecological notion of form in these genealogies illustrates a split between the fundamental assumptions and explanatory principles of the epistemological idealism of Humboldt and Clements, on the one hand, and the epistemological realism of Warming and Cowles, on the other” (p. 77).

Linking Clements’ notion of plant community to Alexander von Humboldt’s physiognomic account of plant form, Konopka argues that “Humboldt’s part-whole logic and implicit theory of manifolds can be properly characterized as an epistemological idealism that relies on a one-sided emphasis on the synthetic achievements of the plant geographer to account for the unity proper to plant formations” (p. 52). As Konopka notes, Humboldt applies the concept of plant form developed in the work of Schiller, Kant, and Goethe to geographical regions. That is to say, “in the same way that one discerns a certain physiognomy in individual organic beings [...] so too there is a physiognomy of Nature that applies, without exception, to each section of the Earth” (Humboldt 2014, quoted on p. 54). The compositional unity displayed in any particular landscape, thereby, is accounted for by a principle of purposiveness determining that formation. The recognition that individual plants function as but parts of a whole formation occurs in the aesthetic apprehension of the geographer. “This means that the purposive unity of organic forms—and by analogy plant collectives—obtains its logical necessity in the achievements of the cognizing subject, namely, the visual impressions and aesthetic experience of the plant geographer” (p. 57). For Konopka, this is the precise sense in which Humboldt’s—and by extension Clements’—account of organic forms supposes an epistemological idealism (p. 95).

Cowles, on the other hand, argues that the distribution and association of individual plants are determined by surface topography and the water variations in the soil of the habitats in which those plants grow. “This account of dune succession illustrates a methodological intertwinement between physiography and ecology” (p. 24). Konopka demonstrates that Cowles’ work rests on the aggregative concept of plant communities (*Plantesamfund* or *Pflanzenverein*) advanced by the Danish botanist, Eugenius Warming. For Cowles as for Warming, the aggregate is composed of individuals that do not function, qua individuals, as parts for the sake of a whole greater than themselves; they operate “with a logic of reciprocal dependence through which a plant society accomplishes something collectively through its large-scale organization” (p. 22). Unity of the plant association, then, is the product of geographical and hydrological variations conditioning the individual plant organisms. This logic of the reciprocal dependence of topography and the nutritive capacity of soil (i.e., water variations) “can be properly characterized as an epistemological realism that prioritized the ideographic particularity of given habitats” (p. 52).

As is clear, Humboldt’s idealistic account of plant form, and thus by extension Clements’ account of plant community, presupposes Kant’s theory of organic form articulated in *The Critique of the Power of Judgment*. Konopka favors the “epistemological realism” of the Chicago school over the “epistemological idealism” articulated in Clements’ work. In chapter three, then, “Kant’s account of organic form: a phenomenological critique,” Konopka’s seeks “to identify and clarify a fundamental epistemological error of biological (and ecological) idealism” (p. 82).

Konopka examines three related theses important to Kant's theory of the biological organism. First, he attempts to show that Kant's conception of the biological organism includes three essential features: (i) that parts and wholes are interdependent, (ii) that this interdependency is contingent rather than necessary, and (iii) that part-whole relations exhibit a means-end or purposive relation that is determined reflectively in judgment. Second, he argues critically against Kant insofar as his theory of the biological organism "grounds the necessary unity of organic forms in the synthetic achievements of the cognitive subject in an asymmetric relation and thereby underdetermines the kinds of unity proper to the organic forms of individuals themselves" (p. 83). Third, following suggestions made by the biologist, Ernst Mayr, Konopka argues that causal explanations in the biological sciences can be subdivided into two distinct types or taxa. Ultimate evolutionary causation offers an historical narrative account of the rise and demise of distinct genotypes; proximate causal explanation details the mechanisms by which the characteristics of the individual result from the interaction of the genotype with the environment. "My claim," Konopka argues in this chapter, "is that the sense-making of the phenotypic individual in its habitat is the primary content of biological forms" (p. 83). That is to say, Konopka agrees with Kant and Mayr that proximate causal explanations remain indispensable to biological theory and "that phenomenological resources provide an attractive alternative to Kant's approach" (p. 120).

Konopka's ambition in his third chapter is great. Not only does he straddle Kant's first and third *Critiques* in an attempt to explain their internal unity, but he also applies Ernst Mayr's pluralistic account of biological explanation to defend his phenomenological account of ecological form. The critical and constructive breadth of his endeavor in this chapter makes unpacking it impossible in this limited review. Perhaps it is sufficient to say that the ecologist will find this investigation opaque and the philosopher will find the compression of basic problems in Kant's critical project dissatisfying.

Importantly, though, this third chapter inaugurates the text's first real engagement with Husserl's phenomenology and initiates, thereby, the first articulations of Konopka's phenomenological approach to ecological form. As mentioned earlier, Konopka favors the "epistemological realism" of the Chicago school over the idealism inherent to the Nebraska's school's account of plant communities. In this chapter—and indeed, for all intents and purposes in the rest of the book—Kant stands in for Clements and the entire Nebraska school of ecology, and Konopka invokes Husserl's own critique of Kant's formalism to refute it. Further, he more positively treats the biological individual as a leading clue for phenomenological elucidation.

Organisms have intimately unified relations of self-organization and these relations are internally unified with (not merely coupled in an external relation to) the sense-making processes involved in the habitual and adaptive activities in their environment. This phenomenological articulation of organic form is different from Kant's account in that it operates with a theory of intentionality that addresses the problem of necessity through an account of objective sense rather than appealing to the synthesizing achievements of the cognizing knower (p. 112).

Konopka thus advances an “epistemological realist” view in line with the Chicago school of ecology which provides objective grounding for the unity of organic collectives. He here employs Husserl’s theory of part-whole relations and the distinction between formal and material ontologies to buttress to the realist epistemology inherent in Cowles’ account.

In the final two chapters of the book, then, Konopka brings these phenomenological resources to the fore. Chapter four, “Husserl’s logic of fitness: parts, wholes and phenomenological necessity,” and chapter five, “Environing places and geometric space” are, consequently, the most phenomenological in theme. The fourth investigation takes up where the Kant-critique in the third chapter leaves off. Here Konopka “reconstructs Husserl’s accounts of unified definite manifolds and part-whole logic and applies them to a phenomenological logic of habitat fitness” (p. 127). Where the theme of Konopka’s third investigation centers on the problem of biological form, this fourth investigation focuses on the necessity inherent to the unity of manifold variations.

For Konopka, “Husserl is an epistemological realist here in a way that Kant is not” (p. 5). Konopka’s primary objection to the Kantian-Clementian account of the unity of ecological forms is that the idealistic account underdetermines the unity of biological individuals. For it too one-sidedly traces this unity to the synthetic achievements of the cognitive subject. The account he will advance in the fourth and fifth chapters advances, then, “a symmetrical notion of presentational dependence that operates with a notion of necessity that can be defined as *necessary supplementation involved in alteration*” (p. 132). Yet Konopka’s realist interpretation of Husserl epistemology misrepresents the idealistic commitments of that philosophy, and this is most clearly seen in the articulation of the “symmetrical notion of presentational dependence” explicated in the fourth chapter.

Konopka concludes his third chapter both summarizing his critique of the Kantian idealist presuppositions underlying the Clementian notion of plant communities and pointing forward to his Husserlian account in the next chapter, where he says that “a symmetrical or double-sided approach to the presentational sense of biological parts and wholes provides a pathway to a logic of sense of the self-organization of biological individuals” (p. 120). However, it is unclear to what “biological individuals” he is referring in this passage. The consequence of his rejecting the idealistic account of organic form is the concomitant rejection of the proposition that plant communities have a unity analogous to that of biological individuals. Habitats, in other words, are not biological individuals. The realist position with which Konopka aligns himself asserts that ecological formations are fundamentally aggregates of biological individuals. Consequently, this brings into question the metaphysical status of the whole as such, i.e., the forest for the trees.

Konopka is not unaware of this issue and discusses this explicitly in the final section of chapter four, “Conclusion: the problem of ecological emergence.” Emergent properties are causally significant properties whose appearance in complex systems cannot be predicted or necessarily accounted for by the activities and interactions of the constituent elements within that system. “But what if the relationship between large-scale organizations and micro-level basal conditions were understood in presentational terms oriented by an explanatory interest in broader ranges of necessity?”

he asks (p. 142). Konopka points out that Husserlian phenomenology is neutral with respect to the metaphysical status of wholes and parts. A phenomenological account thereby undertakes to describe ontological dependencies by reference to lawful relations of foundation as they occur presentationally.

The presentational sense of the trees as an aggregate collection is a founding moment in the presentational sense of the forest as an organized collection. The concept of trees does not logically exhaust the concept of forest, however. The forest has large-scale functional organization proper to a habitat – organized manifold of ecological fitness – that is not conceptually reducible to the trees. The forest-as-habitat has an incompressible pattern of necessary associations that, in principle, has its own determinate sense of meaningful contents (pp. 142–143).

Accepting this account, though, does nothing to diminish the fact that organisms display a tighter unity of whole-part relations than can ever be found in ecosystems. The very self of self-organization appears at best muted, or simply absent, at the large-scale level. Konopka thus equivocates when he speaks of “biological individuals” in his text: sometimes he refers to organisms; often, though, he appears to be speaking of habitats, i.e., “the ecological things themselves” (p. 9).

This problem of equivocation could be remedied were Konopka to elucidate more carefully the dual character of phenomenological description in the fourth chapter. While he does not ignore the synthetic activities of the cognizing subject in picking out and attending to objects in the field of consciousness in his realist account of Husserl’s theory of intentionality, he nevertheless downplays their significance in this overly brief chapter. “For Husserl, the unity that is achieved in the synthesis identity of perception is inherent in the determinate sense of the object itself and is not reducible to the perceptual achievements of the cognizing and embodied subject” (p. 135). Konopka is correct to assert, as he does a few lines later, that “unity is here discovered (not achieved by the knower)” (p. 135). But Husserl is no realist. That is to say, while the articulation of sense in consciousness is not reducible to subjective accomplishments alone, it cannot be accounted for entirely objectively either. Husserl’s phenomenology is an idealism, a point never mentioned by Konopka in his book. His realist interpretation of Husserl’s phenomenology, I would suggest, underplays the accomplishments of the subject in grasping and holding on to an identity as it persists qua *die Sache selbst* in consciousness. Hence, it remains unclear in these investigations *how* one grasps the forest qua forest for the trees.

Yet the forest qua habitat is an object that can be grasped as such because of the ecological relations on display within it. Indeed, the phenomenological tools Konopka employs provide necessary clarification of the objective relations encountered and studied by the ecologist:

We could say, for example, that the beech tree is a mediate founding moment to the nutrient provision of the woodpecker, while the insect is the immediate founding moment. It is according to the founding relations such as this that the nutrient fitness involved in a habitat is not merely a sum or aggregate, but an organized and organizing collective of meaningful relations that, as we have

seen, have suppositions and forms of unified contents that are proper to the kind of object that it is (p. 132).

This logic of fitness described here, rooted in Husserl's logical analyses of identities-in-a-manifold, brings clarity to the Chicago school's concept of ecological form. The ecological things are not *mere* aggregates; the logic of reciprocal dependence which is on display in habitats accomplishes something collectively.

Consequently, as Konopka highlights in his fifth and final chapter, "Environing place and geometric space," such habitats have a unique worldly character. They do not merely surround but also constitute the very lives of the animals within them. "This is not a mathematical logic of spatiality, but a logic of the spatial sense of relative locations that does not uncritically abstract from the perceptual sense of embodied habituation" (p. 148). Ecological things, in other words, are the lived worlds, not mere spaces, of living organisms. Thus, their study requires sensitivity to the objective intersubjective relations constitutive of that place.

Reading Konopka's work promotes two worries. The great promise of this book is that it bridges both ecology and phenomenology. I fear, though, that working ecologists and many historians of science may get lost amidst the thickets of phenomenological analyses in the later investigations of this work, just as many phenomenologists may lose their footing as they work through the jargon in the earlier genealogical investigations. Second, the brevity of the phenomenological fourth and fifth chapters of the book highlights a problem with Konopka's realist interpretation of Husserl. He forcefully critiques the idealism of the Nebraska school without adequately clarifying that his own approach articulates a fundamentally different and novel phenomenological idealism. Some recognition and redress of this omission is called for. But for any fault one may find in the work, this remains at the end of the day an excellent resource. The care with which the author documents his approach as he delves into the literature of both ecology and phenomenology is as admirable as it is impressive. Indeed, for anyone interested the application of Husserl's phenomenology to a new domain, Konopka's investigations are a model to follow. The approach articulated herein is new to ecological studies and to phenomenological studies. This innovation is both long overdue and most welcome.

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