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Around 1986: The Externalization of Cognition and the Emergence of Postprocess Invention

Around 1986 inventional researchers began to presuppose an externalist philosophy of mind, thereby ushering in the postprocess era. Ecological composition and posthumanism, now understood as postprocess inventional models, present direct pedagogical applications, allowing different objects (e.g., databases, search engines) to qualify as writing and favoring rhetorical impact over “originality.”

In a 2011 article, John Whicker describes the meaning of the term *postprocess* as “something we all seem to know but haven’t yet clearly explained nor seemed to understand the same way,” and goes on to demonstrate “the diverse and often contradictory ways” that compositionists have employed the term (497–98). For Whicker, this indeterminacy presents serious problems. He states, “Through this now dominant casual use of ‘post-process,’ the term becomes a great obfuscatory conflation of conceptualizations” or, stated more pointedly, a “power-move,” intended to support any number of experimental institutional or pedagogical programs and deny other, more traditional ones (523). While I disagree with Whicker that the principal function of *postprocess* is to provide the shibboleth through which certain compositionists identify themselves as “members of the dominant clique in the field,” I agree with his larger point (521).

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Whatever the adjective *postprocess* may denote when attached to composition theories or pedagogies, it doesn't resolve into just one thing. Inevitably, compositionists have neither understood its implications uniformly nor reached precisely the same conclusion(s) concerning its applications.

The terminological confusion that Whicker identifies may have produced the “puzzling” silence in postprocess scholarship previously noted by Matthew Heard as well. Heard writes: “Part of why postprocess theory may have lost its foothold in composition is that we know its name but not what it really *means*” (285). Whicker and Heard hold substantially different views toward the utility and prospects of postprocess approaches, of course, with the former skeptical and the latter hoping to clear a space for pedagogical applications within the “unique environments of our situated classrooms, composed as they are by the values and backgrounds of our students” (Heard 301). But, even so, both fixate on the question of meaning, suggesting that its absence presents serious hazards to both postprocess scholarship and pedagogy. I find this common tendency understandable; in most cases, one cannot overstate the importance of terminological clarity. Yet, for both theoretical and practical reasons, defining *postprocess* precisely may not be as crucial as one might imagine.

To ask what a thing means is to attempt to pin it down, to resolve its complexity, to gain some form of mastery over it, to translate it into something more recognizable—that is, to deny the thing its singularity or uniqueness. But, postprocess is rightly described as a rejection of mastery (Breuch 141), and it is a theory about attending to singularities *as such*. Postprocess theorists argue that if two things are not precisely the same, they are radically different. Therefore, the names we give to things often inhibit our ability to attend to them. As Gary A. Olson asserts, “When you mention ‘prewriting,’ say, you mean something very specific, but *your* notion of prewriting—what it is, how it works, how to teach students to engage in it—will be different from someone else’s notion.... Nevertheless, we ignore this fact and treat aspects of writing as if they have a solidity that they just do not have” (424–25). If statements like this are true of prewriting, then they are equally true of the theory or theories one brings toward that act, including postprocess itself. In this light, one need not lament the polysemic nature of the adjective *postprocess*; rather, it is a necessary, even integral component of the theory itself. The sound and the fury are not simply smoke and mirrors; a lack of clear signification does not amount to deception.

Making no pretense toward explaining postprocess theory as a whole, in this document I trace its genealogy within a single subset of composition scholarship: the body of work concerning rhetorical invention. In doing so, I

One need not understand the meaning of the term in order to apply a postprocess approach. Indeed, as my historical account illustrates, one need not even possess the term.¹ Rather, beginning around 1986 and gaining steam ever since, many of the most robust approaches to invention have exhibited postprocess tenets—and some of these theoretical systems present direct applications to composition instruction.

hope to shift the scholarly conversation away from definitional concerns and to continue the intellectual project admirably begun by Heard, Lee-Ann M.

Kastman Breuch, and Paul Lynch: calling forth postprocess theory's pedagogical implications and applying them to particular acts of writing. While emphasizing the inherent linguistic indeterminacy of *postprocess*, I advocate this departure for a more straightforward reason, as well: one need not understand the meaning of the term in order to apply a postprocess approach. Indeed, as my historical account illustrates, one need not even possess the term.¹ Rather, beginning around 1986 and gaining steam ever since, many of the most robust ap-

proaches to invention have exhibited postprocess tenets—and some of these theoretical systems present direct applications to composition instruction. In justifying this claim, however, I must assume an atypical argumentative stance, identifying two scholarly discourses as theories of postprocess invention, though neither is typically framed as a postprocess theory *or* as a theory of invention. I refer here to ecological and posthuman approaches to composing.²

Though postprocess theory bears an oft-cited relation to the “social turn” of the 1980s (cf. Trimbur 109; Fulkerson, “Composition” 670), I suggest that this widespread theoretical conversion was but one, albeit crucial, stage in a longer trajectory.³ The recent history of inventional theory evidences a steady broadening, which I will call an *externalization*, in its underlying concept of “mind.” Whereas the majority of process-era inventional schemes presupposed cognitive “internalism,” the idea that one’s mind is separate from other minds and from the world in which those minds exist, many (and perhaps all) postprocess approaches—including ecological and posthuman versions—assume an “externalist” viewpoint: that no cognitive action can occur without the contribution of human or nonhuman others, including languages and various technological artifacts.⁴ By describing how externalized minds operate, ecological and posthuman theories help account for the inventional act or event: how it happens, where it happens, among and with whom it becomes manifest. Each offers a broadened account of human (and, subsequently, nonhuman) cognition, thereby allowing for a different vision of the writer, the act of writing, and the written text. To favor an individualistic or internalist view of invention is often, by implication, to forward a vision of writing in which self-expression

and clarity of presentation are paramount; one is a good writer for the ability to translate one's own ideas into words and to employ approved grammatical standards. In contrast, complex or networked postprocess forms of invention allow very different objects to qualify as writing (including things like databases and search engines, or even networks themselves) and advance very different definitions of quality, often favoring rhetorical outcomes over precise meanings (Johnson-Eilola, "Database" 220; Johnson-Eilola and Selber 375). Furthermore, given the current media environment, in which texts blend together in constantly evolving media networks, "fragmentation" and "arrangement"—that is, tearing apart and putting (back) together—are becoming increasingly viable forms of creativity. As Johndan Johnson-Eilola notes, "newness" seems less and less relevant with each passing day ("Database" 209–10). In networked spaces, creativity is increasingly becoming "the ability to gather, filter, rearrange, and construct new texts," to (re)deploy texts within novel contexts, or, as he states elsewhere, "movement, connection, and selection rather than a mythical genius to pull inspiration from within" (*Datacloud* 134, 110).

In breaking from the received wisdom about postprocess—that the term denotes an approach or mindset—I suggest that it also refers to a period of compositional thought, especially concerning invention. Since roughly 1986, postprocess has acted as a disciplinary cultural dominant, with its tenets (the impossibility of generalization, the unteachability of writing as such, et cetera) providing the largely unspoken foundation(s) on which a host of divergent theories arise.⁵ Of course, while dating the origin(s) of postprocess invention, I would also reaffirm a point made by Richard Young and Maureen Daly Goggin: "Different frames prompt different decisions about boundary markers" (31). In studying any other subfield, one might arrive at a slightly different periodization schema. In any case, what Janice M. Lauer ("Rhetorical") frames as the dispersal of inventional research into a "diaspora" of related subfields, I would instead identify as its entry into the postprocess era, a transition largely attributable to externalization. Stated differently: as those researching invention increasingly came to reject internalist models of cognition for more social and ecological ones, a broad "crisis" began to emerge within process theory—an event implicitly demonstrating how theoretically crucial internalism had always been. Furthermore, the transition from process to postprocess would necessarily entail the dispersal that Lauer notes, given that postprocess theories tend to focus on specific applications as opposed to generalized principles, and also a related disavowal—of invention as singular, settled, and resulting from direct human intention.

Though my ensuing analysis focuses primarily on the intellectual history of an academic discourse, I would begin with an important caveat: these theoretical transformations did not transpire in a vacuum, apart from more material, historical shifts. That is, changes in compositional theory derive from more than just the intentional acts of composition theorists; they emerge in response to and with assistance from advances and adaptations in the ecology of writing, which is itself active in the productive process. Ecological and posthuman principles have become more central to composition's disciplinary consciousness because changes in the techno-linguistic-intellectual ecology of late twentieth-century America have afforded novel possibilities for and practices of writing. In their application and use, the personal computer, the search engine, the wiki, and other information technologies have produced major shifts in the concept of invention, making the idea that writing had ever been individualizable seem ever more untenable. In addition, as a steadily widening portion of the population gains what Gregory L. Ulmer calls *electracy*—an emergent, typically computer-mediated or computer-enhanced Information Age skill set, analogous to the role of literacy for print-based cultures—the aforementioned electronic tools no longer appear technically complex.

This article proceeds in three sections. In the first, I offer a synopsis of the major distinctions between internalism and externalism as philosophies of mind, focusing especially on matters that would seem to impact writing instruction. In the second, I identify a notable increase in externalist approaches to composition around 1986 and in the years since. Contending that theories of the inventing mind are, by extension, also theories of invention, I demonstrate the theoretical advances that ecological and posthuman approaches might provide for inventional discourse. In the final section, I focus on two viable, practical methods of postprocess invention: Collin Gifford Brooke's concept of proairetic invention and Johndan Johnson-Eilola and Stuart Selber's notion of the assemblage. I conclude with the assertion, which ought to be fundamental to any externalist or ecological account, that changes in the ecology of writing must impact the theories employed therein. As a result, inventional theory, as with every other theory of writing, must be continuously rewritten to suit the ecology in which it is applied.

I. On Philosophies of Mind: Internalism versus Externalism

Philosophies of mind hold a foundational relationship to movements within composition scholarship. Thomas Kent first alerted the field toward this connection, but Joe Marshall Hardin states the case most pointedly: “Even the

most social of process theories ... are internalist philosophies masquerading as externalist," whereas, from his vantage, a "radical externalism . . . undergirds postprocess theory" (71, 65). In this section, I offer a brief overview of those two philosophies of mind, internalism and externalism, paying heed to the latter's principle varieties: *what-externalism* and *how-externalism*. This summary serves two related purposes. First, it seems to me that discussions of these philosophies of mind have remained on the disciplinary borders of composition studies, such that their implications have neither been fully explored nor integrated into much "mainstream" research. Second, and more importantly, because relatively few scholars have understood postprocess forms of invention, including posthuman and ecological composition, to exhibit variously a shared externalism, those fields have developed along separate trajectories that only occasionally speak to one another—and that only occasionally explore their implications for invention *as such*.

To articulate the nature of internalism, I invoke a familiar claim: René Descartes's "I think, therefore I am." Before offering this statement, Descartes acknowledges that "our senses sometimes deceive us," and he therefore rejects all prior lessons in reasoning that he has received, determining to deny knowledge of all the objects that had ever entered into his waking mind (21). He asserts, however, that one thing can still be assuredly known, even to an ardent skeptic: his own thought allows these insights to emerge, and that same thought therefore confirms his own existence. From this point, Descartes hastily intuits that he is "a substance the whole essence or nature of which is to think, and that for its existence there is no need of any place, nor does it depend on any material thing," and he concludes that his essential nature (or "soul") exists "wholly distinct from the body" (21–22). In making these claims, Descartes suggests that thought itself is primary to language, existing both before and outside of it; that mental processes stand aloof from the environment in which the mind is positioned; that the body and the mind are wholly separate entities; and that cognition is asocial: one might be able to think if she or he was the only person on earth. Each of these claims is central to an internalist philosophy of mind; externalism inverts them.

Hardin asserts a clear division between process and postprocess theories according to their respective internalism and externalism, but I would temper this claim slightly. Considering process to designate both an approach and an era, I would acknowledge externalist outliers during the period, including Richard Coe, and, to a lesser degree, the difficult-to-categorize Ann E. Berthoff.⁶ Even so, if one were to follow Lester Faigley's tripartite taxonomy of major pro-

cess approaches—cognitivist, expressivist, and social—one could illustrate the internalism of each subfield’s leading theorists.⁷ Internalist suppositions are most evident in the early cognitivist models of Linda S. Flower, John R. Hayes, and their followers—one thinks here of their attention to *the student writer* (singular) and to their characteristic method of studying physically quarantined students—but they appear equally in the

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expressivist call to express *oneself*. As Lisa Ede and Andrea Lunsford rightly demonstrate, many of the expressivist theorists most commonly associated with student-centered instruction, including James Moffett, Donald Murray, Peter Elbow and Ken Macrorie, quite ironically avowed “traditional concepts of autonomous individualism, authorship, and authority for texts” (*Singular Texts* 113). Though I might situate them

in a historical interregnum, as those providing a conceptual bridge between internalism and externalism, or between process and postprocess, Kenneth Bruffee and other social constructionists/social-epistemic rhetoricians did ultimately avow internalist principles, as well (Kent, *Paralogic Rhetoric* 98–104).⁸ Bruffeean collaborative learning, for instance, supposes that individuals can, if they so choose, operate alone. In contrast to these process-era approaches, the externalist theories emerging since the dawn of postprocess suggest that such aloneness is an ontological impossibility, forbidden by the very fact of one’s being in the world. All writing is always already overwritten by other people and, crucially, other *stuff*.

Externalists, in short, argue that environmental features, including languages, tools, and other people, can be and indeed *are* constitutive elements of one’s mental systems. Externalist theories blur the distinctions between body and mind, mind and world. To further explain its premises, one might productively define two subforms: what-externalism (also known as content externalism) and how-externalism (also known as vehicle externalism). As Susan Hurley notes, the former “invoke[s] external factors to explain the ‘what’ of mental states,” whereas the latter “invoke[s] external factors to explain the ‘how’ of mental states” (101). Though the correspondence does not operate in a one-to-one fashion, ecological compositionists and scholars of postprocess qua postprocess seem to rely more strongly on conceptions of what-externalism; in contrast, when and where its theorists attend to questions of cognition, posthumanism entails how-externalism.

In the Anglo-American analytic tradition, what-externalism, the more well established of the two, first emerged in the 1970s and 1980s in works by Hilary Putnam, Tyler Burge, and Donald Davidson. Given that Thomas Kent has attended to Davidsonian externalism at some length (*Paralogic Rhetoric* 104–11), I briefly explain the contributions of Putnam and Burge. To illustrate that mental activity relies upon factors outside the head, Putnam and Burge articulate two arguments, the first concerning the impact of environment in structuring thought and the second regarding what Putnam calls the “social division of linguistic labor.” To justify the former, they pose similar “twin earth” thought experiments, asking what might happen if a person’s intrinsic characteristics (i.e., mental states, beliefs, desires, and so forth) were to remain constant while her or his environment changed in substantial ways—such that, for instance, the term *water* might apply to the chemical formula XYZ as opposed to H₂O (Putnam) or the term *arthritis* apply to a host of rheumatoid ailments, affecting parts of the body beyond just the joints (Burge). Though these analyses are quite complex, their conclusions are fairly straightforward: both contend that environmental transformations would also produce major shifts in internal, mental traits. Burge states:

The upshot of these reflections is that the patient’s mental contents differ while his entire physical and non-intentional mental histories, considered in isolation from their social context, remain the same.... The differences seem to stem from differences “outside” the patient considered as an isolated physical organism, causal mechanism, or seat of consciousness. The difference in his mental contents is attributable to differences in his social environment. (79)

That is, put as simply as possible, in a world in which *arthritis* refers to a different thing, all of one’s thoughts about arthritis (or making oblique reference to it) will be different.

In his foundational 1975 text, “The Meaning of ‘Meaning,’” Hilary Putnam demonstrates a crucial, though largely unremarked, fact about language: that it relies upon a “division of linguistic labor.” He writes, “We could hardly use such words as ‘elm’ and ‘aluminum’ if no one possessed a way of recognizing elm trees and aluminum metal; but not everyone to whom the distinction is important has to be able to make the distinction” (227). For instance, though I haven’t studied chemistry in years and couldn’t identify the metal by its atomic structure, I can still make true statements about aluminum: that it conducts heat well and abounds in the earth’s crust. Putnam’s insight holds far-reaching implications; he argues: “Ignoring the division of linguistic labor is ignoring the

social dimension of cognition” (271). Unlike internalists who generally assume that thought precedes communication (or the translation of thought into language), what-externalists suppose that languages both allow for and structure thought. Words are tools—employed by humans but external to them, and Putnam notes that two types of tools exist: those, like screwdrivers, that a single person alone can employ, and those, like steamships, that require cooperative activity. Words fit the second type (229). One can only think by building off of the contributions of others; for thought to exist, one must encounter both a world and at least one other human.

How-externalism has entered philosophy of mind scholarship more recently, and those who advocate its existence generally accept (and recognize their debt to) what-externalism, though the same is not necessarily true in reverse. Andy Clark and David J. Chalmers suggest that how-externalism differs greatly from what-externalism in that it is *active* in the here-and-now, while the models delineated by Putnam and Burge are *passive* in the present tense. How-externalism, also known as the *extended mind* thesis, suggests that environmental elements drive cognitive processes, such that if those elements were to be removed, the cognitive process would deteriorate, just as if part of one’s physiological brain were excised. Defining a “parity principle,” Clark and Chalmers write, “If, as we confront some task, a part of the world functions as a process which *were it done in the head*, we would have no hesitation in recognizing as part of the cognitive process, then that part of the world *is* (so we claim) part of the cognitive process” (27). To justify this position, Clark elsewhere provides a convincing anecdote. Suppose, he writes, that you are a person inclined to wear a watch, and that someone asks you if you know the time. Many of us, “*even before consulting our wristwatches*,” will respond that, yes, we do (41). Were you to find your wristwatch missing, however, you might be forced to concede that, no, in fact, you do not know the time. The wristwatch, then, has become integral to the thought process. Humans, of course, merge similarly with an indefinite number of other objects: calendars, sticky-notes, dictionaries, maps, GPS navigation systems, and so on. Clark argues, therefore, that the distinction between “that which is *easily and readily accessible* and that which should be counted *as part of the knowledge base* of an active intelligent system” is so minor and so inconsistent that one could rightly identify external elements as portions of the mental apparatus (42). The human mind has always necessarily functioned via externalism; even so, as high-speed Internet connections, search engines, smart phones, and the like increasingly become

sine qua nons of both contemporary labor and leisure, the externalist nature of human minds becomes more and more apparent. Clark suggests that the “ancient seepage” of mind into world, and vice versa, is “gathering momentum,” such that the mind is located “less and less in the head” (4).⁹

II. Around 1986: The Appearance of Externalist Invention

One might account for the history of postprocess in any number of ways, but my focus on inventional scholarship is strategic insofar as it follows a tendency in prior work and helps to explain one of the field’s historical curiosities. In 1962, Elbert W. Harrington would write, “Most teachers know that rhetoric has always lost life and respect to the degree that invention has not had a significant and meaningful role” (373). While I remain agnostic concerning the factual content of Harrington’s claim, I would note its fairly widespread endorsement throughout the 1970s and 1980s by Richard E. Young and Alton L. Becker (453), Janice M. Lauer (“Heuristics” 396), Lynn Worsham (201), and George L. Pullman (369), among others. In short, several (and perhaps many) scholars seem to have seen inventional research as a vital aspect of that newfound discipline, rhetoric and composition, during the years when process reigned. Even so, as Kelly Pender states, “After the 1980s, compositionists weren’t exactly lining up to answer the question, *What is invention?*” (66). Furthermore, in her 2002 book chapter, “Rhetorical Invention: The Diaspora,” Janice M. Lauer points out a somewhat harrowing truth: the 1993 collection *Landmark Essays on Rhetorical Invention* had not included an essay written after 1986, and in the years since then scholarship devoted exclusively to invention had become “difficult to find.” Lauer concludes, however, that inventional research had not disappeared but “migrated, entered, settled, and shaped many other areas of theory and practice in rhetoric and composition” (1–2). She also identifies more recent approaches as being “dispersed and localized, precluding any final characterization of a unified theory or common set of practices” (11).

I do not intend to argue against Lauer here but, instead, to offer a parallel account. While much inventional work *did* migrate into other areas around 1986, an entirely different strand began to emerge simultaneously—one with externalist instead of internalist presuppositions: a postprocess approach. However, I would raise two important caveats. First, because prior theories held a foundational relation to internalism, this new, externalist scholarship was not initially recognized as relevant to invention *as such*. Second, I do not mean to imply that all inventional work became externalized, evidencing

postprocess tenets around 1986. Rather, this is the date of emergence for the earliest of such works. Indeed, none of the post-1986 works Lauer mentions in her own survey are ecological, posthuman, or explicitly postprocess in nature. Even so, the dispersed and localized nature of those theories, coupled with their resistance to theoretical generalization, bears the marks of postprocess, and I cannot help but note the coincidence of her schema with my own. In this section, I examine early externalist works to construct a genealogy of contemporary inventional theories. In the process, I hope the reader may note the degree to which disciplinary “common sense” has shifted during the last thirty years. While the externalism advocated in early works once had to be argued for or justified strenuously, many current texts simply presuppose it.

The first major wave of scholarship on externalist composition began around 1986, with contributions from Marilyn Cooper and James E. Porter.¹⁰ James A. Reither’s “Writing and Knowing,” which carries the subtitle “Toward Redefining the Writing Process” and which would argue for the inter-animating and co-constitutive roles of writing and its context, was published in October of the previous year (1985). In that text, Reither notably identifies writing as “a more multi-dimensioned process” than had been commonly imagined. He also asserts that the process in question “begins long before it is appropriate to commence working with strategies of invention”—thereby identifying a conceptual lack in prior inventional schemes (623). In 1987 Karen Burke Lefevre would offer the most detailed and explicit analysis of socially conceived invention to date, both then and now. In *Invention as a Social Act*, she identifies the first canon as both a finding and a making of subject matter and further asserts: “Invention ... is, I think, best understood as occurring when individuals interact dialectically with socioculture in a distinctive way to generate something (2, 33). Lefevre places a concerted emphasis on the multiplicity of human actors within the inventional schema and exhibits comfortability with open-ended indeterminacy. In her model, one aims to generate “something,” though its nature remains unclear and possibly unknowable.

Given the increased complexity Lefevre attributes to it, invention no longer appears as an appropriate task for a single writer. It necessarily becomes an act in which individuals commune—either mediated by texts or more directly, through dialogue. Subsequent scholars would identify even Lefevre’s model of invention as too narrow—particularly for its anthropocentrism and its privileging of conscious intention over contingency and accident. However, Lefevre’s work nonetheless marks an important transformation in the discipline: the last gasps

of one paradigm and the birth of another. Her vision of the social appears to have derived from (internalist) collaborative learning scholars (121), but she herself points toward the next major development in inventional research—an (externalist) ecological understanding. In her conclusion, she writes, “We should study the ecology of invention—the ways ideas arise and are nurtured or hindered by interaction with social context and culture” (126). Subsequent scholars likely would not have arrived at (or, at the very least, accepted) these more complex conceptions of invention without first extending the definition one crucial removal—from the individual to the group.

Writing around the same time as Lefevre, Marilyn Cooper produced the first major document on ecological composition, which, insofar as it explains where ideas come from, is a theory of invention at its core. She begins her foundational article, “The Ecology of Writing,” by asserting that “the time has come for some assessment of the benefits and limitations of thinking of writing as essentially—and simply—a cognitive process” (364). Her major quarrel isn’t with cognitivism in the Flower and Hayes sense per se, but with a certain dominant conception of what thought entails. More precisely, she opposes depictions of the author as isolated or solitary, working “within the privacy of his own mind” (365). Cooper asserts, instead, that the primary tools of thought—languages and texts—are themselves socially constituted (or what Bakhtin would call *dialogic*): words carry with them the traces of their prior application. No one can have an idea without relying upon, extending, or contending with the thoughts and ideas of others (369). Cognition is, in short, inherently and inexorably distributed.

Ecological theories figure invention less as a bringing forth of resources out of oneself (the individualistic, internalist definition) or even out of a group of people (the social or collaborative view) but imagine the canon’s functions more rhizomatically. That is, ecological theorists ask which resources can be connected to the self, either ephemerally or indefinitely, in order to produce some sort of novel item, to assemble a set of preexisting items for alternate usage, or even to rearticulate a given object in wholesale fashion for an alternate purpose. The resources that one might employ are practically limitless, they assert, and the writing process functions best when one acknowledges and responds to the indefinitely many affordances and constraints that existence accords him or her. As a result, a common trope of recent scholarship is that one’s historical predecessors did not externalize their theories enough. Expressivists were purportedly too concerned with the self; collaborative learning

enthusiasts and even early ecological thinkers were purportedly too concerned with human actors (cf. Syverson 24, criticizing Cooper); though relying on complexity theory, some other ecological theorists didn't make their works complex enough (cf. Hawk, "Toward a Rhetoric" 846, criticizing Syverson); and some depictions of ecology fail to trouble the subject-object distinction adequately and to recognize the role of attention in determining the salience of ecological factors (Rickert xi–xii).¹¹

While attending to situated, contingent variables, ecological composition also posits uncertainty and precarity as both inputs and outputs of the writing process. In Mark C. Taylor's words, "The moment of writing is a moment of complexity"; it is composed of an indeterminate number of connected parts, some of which act sequentially while others act in parallel fashion.¹² Most importantly, the self-organization and interaction of parts within complex networks produce effects that "are not necessarily reducible to the interactivity of the components or elements in the system" (198, 172). That is, because it is complex, one cannot predict the outcome of writing by assessing or measuring ingredients as one would when baking a cake; the process is substantially more chaotic. No process can guarantee the production of a given, desired result. In this light, the postprocess mantra that writing cannot be taught but can be learned—each time, anew—is more readily understandable (cf. Olson 426; Kent, "Principled Pedagogy" 432).

Ecological composition and posthumanism are similarly indebted to methods of systems-thinking, especially cybernetics, and the distinction between their approaches is largely a difference in emphasis, with the latter studying the body itself more closely and privileging the role of technology more heavily. Many of the best ecological thinkers hardly discuss IT (information technology); for instance, the word *technology* does not appear in Cooper's text at all, and Thomas Rickert draws inspiration for his ambient theories from the concept of *terroir* in winemaking and from the ambient interplay of natural elements affecting prehistoric cave paintings (x, 6). In contrast, one's relation to technology is the primary philosophical question posed by certain posthumanists. As N. Katherine Hayles notes, "The posthuman implies not only a coupling with intelligent machines but a coupling so intense and multifaceted that it is no longer possible to distinguish meaningfully between the biological organism and the informational circuits in which the organism is embedded" (35).

Both models, ecology and posthumanism, base their arguments concerning writing on a conception of mind: cognition as a necessarily plural act (or

response, or interaction), accomplished by an indefinite number of human and nonhuman actors that have become localized and functional in collaborative effort. As even the name of the field, posthumanism, suggests, to imagine thought in this way is to reconceptualize the nature of personhood, such that many of the most common phrases no longer seem apt. One is not simply a subject but also an *object*, both actor and acted upon; nor is the subject/object simply or solely *human*, given its what-externalism and sometimes literal incorporation of technological artifacts (e.g., pacemakers, antidepressants, or even headache medications). Posthumanism, like ecology, is a disavowal of boundaries, and John Muckelbauer and Debra Hawhee therefore define it as “an attempt to engage humans as distributed processes rather than as discrete entities” (768). Via the *topoi* or “places,” inventional theories hold a long-standing relationship to spatiality, but when humans link up with connected informational devices, and especially when they enter into or co-construct cyberspace, they encounter immaterial environments with “the potential for a complete reimagining of invention,” ones that are, as Jeff Rice notes, “layered, confusing, and constantly changing” (“Networked Boxes” 305). Through a form of wired (or, increasingly, wireless) how-externalism, the mind traverses an indefinite number of informational circuits more or less simultaneously and conducts complicated operations with previously unthinkable rapidity. One cannot generalize about how ideas emerge in such contexts, except to say that their origins extend outside the writer’s own skull.

III. Possible Interactions with/in Posthuman Ecologies: Some Tentative Guidance for Application

Ecological and posthuman theories of composing are not theories *of* the first canon so much as theories *involving* or *affecting* it. One would be more accurate in calling them theories of the (necessarily plural) inventing actors or actants. Much like other branches of postprocess theory, neither offers much in the way of positive approaches to creation or discovery; they are postpedagogical in that their tenets seem to deny the possibility of universal or even generalizable directives. Because they value connectedness and relationality so seriously and thereby deny the autonomy of the mind, neither asserts that one inventional success can serve as precedent for any other. Put simply, the conditions enabling a given invention will never emerge again in precisely the same form. By Collin Gifford Brooke’s estimate, though, the value of ecology lies precisely in “its ability to focus our attention on a temporarily finite set of practices, ideas, and

interactions” without concerning itself with their stability or recurrence (*Lingua Fracta* 42). A given method or pedagogy is not transferable or portable to other contexts; *kairos* reigns. Yet, *kairos*, now understood as a spatio-temporal

Taking for granted its situated status and provisional nature, an acknowledgment that one cannot control the inventional process, then, seems to me a more intellectually honest approach. In foregrounding contingency, profound uncertainty, randomness, and openness, and in learning how to enable, channel, or direct forces beyond one’s direct control, the writer allows himself or herself to be rewritten, rewired, re-paired.

situation in which a rhetor is enmeshed and from which her or his actions cannot be isolated, does not negate the art of invention but instead serves as its ground (Rickert 77–78, 82; Hawk, “Toward a Post-Techne” 381). Stated more directly: *kairos* enables invention. Of course, from an externalist perspective, every inventional act is caught up in its own surroundings by default, inasmuch as no mind can think in isolation. Figuring invention as a combination of “consciously taught elements” (e.g., *topoi*, prewriting) and responsiveness, Byron Hawk therefore contends that one must engage in “continual, situated invention—that is, remaking techniques for every new situation.” If

one could articulate a postprocess model for invention, it would be this: new each time, constantly evolving in response to situational constraints (“Post Techne” 388–89).

Postprocess theory has earned a reputation for being abstract, vague, inapplicable—even nihilistic in disavowing the writer as subject of the writing act. And, of course, such views are not necessarily unfair. Even its defenders have been forced to concede, as Breuch does, that postprocess theory suggests few “concrete assignments or classroom environments” (127). To many compositionists, especially those favoring certainty and mastery, a command of conventions and rules, the theoretical advances offered by ecological and posthuman accounts may seem to present theoretical surrender or decline. But, I want to argue the opposite: the greatest contribution of these models may be their “revaluing of partiality” (Brooke, “Forgetting” 791). Inventions (both rhetorical and otherwise) reconfigure the nature of existence and in so doing change what one might imagine or expect. Francis Bacon, the English statesman, scoundrel, and scholar (not to be confused with the twentieth-century painter of the same name) states this matter well: “*Ars inveniendi adolescit cum inventis*,” that is, the art of invention grows with inventions (741). In taking for granted its situated status and provisional nature, an acknowledgment that one cannot control the inventional process, then, seems to me a more intellec-

tually honest approach. In foregrounding contingency, profound uncertainty, randomness, and openness, and in learning how to enable, channel, or direct forces beyond one's direct control, the writer allows himself or herself to be rewritten, rewired, re-paired.

The preceding pages seem to suggest that the art of invention is dead, while the practice—and, even more importantly, the experience—of invention is alive and well. The latter parts are certainly true, but the former is not necessarily. Postprocess approaches do not deny the utility of prewriting, or heuristics, or the Burkean pentad but provide a more complex appraisal of their operations and a more robust framework for their application in particular instances. And, furthermore, models for posthuman or ecological invention already exist. Believing that computers, the Internet, and, more generally, networked writing ecologies are here to stay, I would like to focus on two promising, contemporary models of invention that might serve as examples for future inventional innovations: Brooke's theory of *proairetic* invention and Johnson-Eilola and Stuart Selber's notion of the assemblage. Since each model presupposes externalism and relies upon ecological or technological affordances, neither can present universal prescriptions for pedagogy. Even so, each illustrates the applications of an inventional theory attuned to its environs.

In *Lingua Fracta: Toward a Rhetoric of New Media*, Brooke establishes an important distinction between two kinds of invention: the hermeneutic and the proairetic. In an uncommon fashion, he defines the inventional process not by where it begins but by where it becomes manifest. In other words, he concerns himself with the space on(to) which one writes. The hermeneutic model of invention, which is more conventional and thus more familiar, "relies on the relative sturdiness of a final object and the negotiation of meanings within it" (68). Its products appear on the printed page, and given their physical solidity, hermeneutically invented objects seem to invite close reading and careful attention in the vein of the New Criticism; when composing for the page, one tends to operate with these consumptive practices in mind. Jeff Rice explains this logic nicely: "The space of the page ... is tied to the single author, the individual who works in one fixed space within a fixed disciplinary focus with a single identity tied to a singly motivated reading practice tied to a single idea expressed at a single moment" ("Networks" 130). Contra the singularity of authorship, closure, and fixity toward which hermeneutic invention pretends, proairetic invention, which seems particularly well suited for the age of new media, is all about openness: to multiple contributors, to multiple meanings,

to multiple uses.¹³ As Brooke explains, “The closing implicit in [hermeneutic] ‘closure’ is a closing off of alternatives, the reduction of a text’s plurality” (*Lingua Fracta* 76). Those practicing proairetic invention, in contrast, desire or attempt to forestall this reduction, to leave as many options for the text available as possible—both in terms of what it could *mean* and what it could *do*. They emphasize “the generation of possibilities, rather than their elimination until all but one are gone” (86).

Through their designs and functions, new media technologies enable and further this proairetic openness. Many spaces for electronic writing, including databases, search engines, blogs, wikis, and discussion forums, remain inherently dynamic (in that they are continuously altered in the process of their use) and exist beyond the control of single authors. The virtual instruments enabling Information Age transmissions and transactions are composed of computer code; in other words: symbols, numbers, and letters. That is, they are *written*, *virtual*. When one queries a search engine, the results it produces are not neutral or natural but result from the conscious planning of its designer. But, just as importantly, databases and search engines are “collaborative in the radically post-modernist sense” that each user rewrites and reinvents the instrument as she or he selects between available options or fills in text. Any new writing is a function of other preexisting works (Johnson-Eilola, “Database” 222). So, these technologies allow for and are produced by decentralized, ad hoc, open-ended, cooperative action. They don’t resolve or dissolve into singular uses but remain available for endless rearticulation. They enable a vision of writing “as not merely the static arrangement of text ... but [as] an active artifact, one put into motion by interaction with others” (223).

In short, new media enable an understanding of writing as “connection” (Johnson-Eilola, “Database” 228). For instance, the hyperlink as a communicational option allows any given user, with just a few keystrokes, to connect the text at hand to an effectively infinite constellation of other texts. Digital interfaces certainly involve writing, but one has a difficult time determining who or how many have written on them, and one has an equal challenge in articulating the bounds of the text(s) in question. With the physical page, some of these questions were easily answered some of the time; with the digital interface, they may be unanswerable. As Brooke argues, to write on or for one of these interfaces is to practice authorship in a way very different from traditional models, engaging in “a more radical distribution of individual intention,” which may not ultimately involve a reduction in the agency of the writer but may constitute instead “a different activity entirely” (Brooke, *Lingua Fracta* 80).

One possible articulation of this “different activity” may be the “assemblage” that Johnson-Eilola and his longtime collaborator, Selber, explore. The two trumpet the virtues of this distinctly postmodern medium, which makes no distinction whatsoever between “invented” and “borrowed” content (375). The name of this concept seems to impend doom for the first rhetorical canon (as traditionally imagined), insofar as it implies a privileging of assembly over and against invention. Of central importance, if one considers the assemblage to be a valid form of writing, then one acknowledges that students may write productively without producing anything new *at all*. Even so, this allowance does not necessarily lead to the death of invention altogether—as though such a thing were possible; instead, as with all forms of writing, this mode carries with it its own theory of creation. In producing an assemblage, the primary role of the writer is to distribute; invention is secondary and, in some instances, either incidental or non-existent. But, as information economist Fritz Machlup demonstrated so long ago, information distribution is its own kind of production (7). Because ideas lack material form, they are endlessly reproducible at effectively zero cost so that, in a very real way, each new idea that a given person learns adds to the sum total of existing ideas in the universe. But, from a less economic and more rhetorical perspective, one might also note that, through each situational redeployment, an idea is born anew. Fitting a concept to its *kairos* is an artistic act, and that idea really is different—even *new*—each time it rediscovers and reasserts its force.

Extending a robust discourse on plagiarism and ownership in student writing that has thoroughly unsettled inherited notions of textual originality and borrowing/theft, Johnson-Eilola and Selber contend that the distinction between these two poles is “not only problematic but also counterproductive” (376). They therefore attempt to imagine a pedagogy—and, more broadly, a form of writing—that would elide the difference. In so doing, they reconceive the value of information production and distribution, privileging “effect in context,” what a work *does*, over “performance,” or how it was created. Johnson-Eilola and Selber state, “Creativity, in this rearticulation, involves extensive research, filtering, recombining, remixing, the making of assemblages that solve problems” (400). The success or failure of a work becomes something that, at best, an instructor cannot judge alone and, at worst, cannot judge at all. The value of the work must be found in its operations with(in) the world, not in the sophisticated and elegant (though largely hypothetical) brilliance of its machinery.

Given the massive repository of information that new technologies make available, students often have perfectly good reasons for repurposing other people's ideas, rather than generating their own. Johnson-Eilola and Selber therefore urge instructors to profit from this development, rather than blindly opposing it out of habit. Instead of always pushing students to develop "fresh insights" (or whichever term is fashionable at the moment), one might offer lessons on how to find good, reusable content—which is not so very different from teaching one to cite sources, ultimately, except that it does away with the false premise that those one credits worked alone. Or, as Jim Ridolfo and Dànielle Nicole Devoss demonstrate, one might instruct students on how to contribute to or otherwise enhance the networks in which and of which they partake by producing reworkable content for others to engage. In sum, to practice the art of invention, one need not imagine the writer as the source of all ideas, original though some may seem. Externalization hardly represents the demise of the first canon. Instead one might see a student writer as a node in a more complex network, one through whom ideas pass, and one that alters or enhances many of them; one who both draws from and contributes to the overall ecology.

Eric Charles White articulates the thesis of his *Kaironomia: On the Will-to-Invent* in simple terms: "Invention must constantly be renewed" (8). Emphasizing the centrality of *kairos*, the opportune moment, he suggests that each rhetorical situation is unprecedented and unique, and therefore those hoping to persuade cannot rely on precedent (13–14). A "systematic treatise on the management of the opportune" could never exist, he argues (20). But, even for those less inclined to believe in the radical singularity of the now, his thesis would seem to bear weight. Old methods lose their force; the world changes; new ways of being and living and thinking emerge; and all of these must have some impact on communicative practices. Invention must be renewed. It remains in a state of becoming, tethered somehow to and yet remaining indistinguishable from the nature of its constituent electracy, which is itself birthing and being born. According to one convention of scholarly writing, I would conclude by forecasting future directions and outlining possible avenues for further research. But, to my mind, that act would seem out of place here. This is an account that must close with a localized, kairotic, ecological agenda. Whatever invention will be, it is presently being and becoming; if you want to see it, look within you, or around you, or in the in-between.

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Notes

1. Following John Trimbur, who first coined the term *postprocess* in 1994, composition scholars commonly identify the late 1980s and early 1990s as the period in which postprocess began (Trimbur, "Taking the Social Turn" 109; cf. Heard 284; Matsuda 65–66). Gail Hawisher and her coauthors provide the earliest dating of which I am aware: the period 1983–85 (65).
2. Here and throughout, I employ *ecological composition* with reference to a theory of rhetoric and writing that contemplates the interaction of subjects and their environs. In doing so, I intend to distinguish it from *ecomposition*, a mode of pedagogy centered around "green" or environmentalist concerns.
3. Providing a corrective addendum, Heard suggests that postprocess "does not incorporate the breadth of all social theories"; rather "stated succinctly, what is truly postprocess is the idea that communication is paralogic—unpredictable and uncodifiable—and that composition must find ways to reflect this idea in theory and practice" (285).
4. In framing ecological and posthuman theories as subfields of a more general postprocess movement, I do not mean to imply that all postprocess theory is ecological or posthuman in nature. As Colin Gifford Brooke and Thomas Rickert (163) and Byron Hawk ("Reassembling" 75) demonstrate, a great deal of postprocess theory is humanist rather than posthumanist in its assumptions.
5. Taking a cue from Raymond Williams, I assume that theoretical movements and the periods that they define interlock or overlap such that, at any given moment, one might be emergent (e.g., postprocess), another dominant (e.g., process), and still others residual (e.g., current-traditionalism). Following Sharon Crowley, I would date the emergence of process to "around 1971," and as I have already suggested, I place the emergence of postprocess—at least within inventional discourse—around 1986. I prefer to remain silent concerning dates of dominance and decline as these may be impossible to identify accurately—via textual traces or otherwise. In *Postmodernism*, Fredric Jameson introduces the notion of the cultural dominant as a means for discussing widespread (though hardly universal) cultural tendencies. He argues that it is "only in the light of some conception of a dominant cultural logic or hegemonic norm that genuine difference could be measured and assessed" (6).
6. Coe's 1974 article "Rhetoric 2001" and his 1975 "Eco-Logic for the Composition

Classroom” would seem to provide the earliest entry into ecological composition. However, he explicitly denied offering a new method of writing instruction, suggesting instead new subject matter for classroom examination: cybernetics and systems-thinking (“Eco-Logic” 232). Berthoff expresses nascent ecological ideas well before 1986, though not employing the term.

7. Though James A. Berlin, Patricia Bizzell, and Richard Fulkerson all offer their own taxonomies of process, none of them mentions a major research strand that might be classified as externalist, either.

8. Writing of his experiences at Brooklyn College, Bruffee articulates quasi-externalist principles: “It seems to me that the situation we were forced to perceive is the relationship between learning—indeed, even knowledge itself—and the social and political contexts of learning,” and further notes that those contexts “determine and define the content and structure of knowledge, the way we use it, and the way we acknowledge its significance” (“New Emphasis” 8). Bruffeean collaborative learning also anticipates postprocess theories insofar as it does not pretend to teach invention—neither as it had been previously understood nor *at all*. As Bruffee would state: “Collaborative learning certainly cannot induce creativity. But it does make a place for it” (“Kenneth A. Bruffee Responds” 78).

9. Posthumanist theorists, who tend to be how-externalists, voice similar claims. N. Katherine Hayles concludes *How We Became Posthuman* by asserting, “We have always been posthuman,” by which she means that the Western notion of liberal, individualist humanism has never been philosophically tenable—and one did not necessarily need information technology to experience and respond to one’s ecology (291, 288). Byron Hawk articulates the role of external forces in the history of externalization aptly: “Technology makes the fact that the body is immersed in networks of complexity much more immediate and harder to ignore” (*Counter-History* 234).

10. In “Intertextuality and the Discourse Community,” Porter demonstrates the interdependency of all texts, insofar as none can exist without precursors, nor can readers understand texts without background knowledge. He also privileges the role of situation and audience in expression, arguing, “In essence, readers, not writers, create discourse” (34, 38).

11. In her 1999 book *The Wealth of Reality*, Margaret Syverson follows Cooper in opposing conceptions of the Romantic individual author; however, she still critiques Cooper’s work for focusing on “social interactions via ideas, purposes, interpersonal inter-actions, cultural norms, and textual forms” (24). In contrast, Syverson argues that an infinitely expansive set of other, nonhuman factors, including “weather, animals, oceans, mountains, and forests,” as well as “buildings, computer keyboards, monitors, [and] modems” also influence cognition and therefore composition (9).

12. Though himself a scholar of religion and architecture, Taylor’s work has inspired

a fair amount of composition scholarship, including a 2004 *JAC* special issue on complexity theory.

13. Brooke derives much of his thought on proairesis from Roland Barthes's theory of the "writerly" text, for which the reader is "no longer a consumer, but a producer of the text" (Barthes, *S/Z* 4; qtd. in Brooke 71). Calling a text writerly (as opposed to "readerly") does little to explain anything about the text itself; it only identifies the behavior of a given reader with respect to it (Brooke 73). With this in mind, one more easily understands that proairetic models of reading and inventing, which Barthes could theorize at early as 1974, are not explicitly linked to new media but have existed as available options for all written texts at all times.

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