introduction

Thanks to a better understanding of networks, humanity has come to recognize that no individual species functions in isolation from the others. As a result, the unique properties of ecosystems are revealed only when they are studied as an integrated dynamic. Similarly, *resonance* is a *relational* property produced when the frequency of one vibrating object matches the natural frequency of a nearby object. So is *synchrony*, a systemic property (like individually swinging metronomes) that emerges when processes become integrated into a collective pattern.

It is gradually becoming clearer that constrained interactions among individual entities, processes, events, species – including relations between species and the environment or milieu in which they live -- are the foundational processes that create integrated systems that cannot be reduced to the individual and erstwhile independent components that comprise them. Moreover, their integrated dynamics are often path-dependent: what happened in the past often continues to influence their qualities and their behaviors. Understanding such complex dependence requires combining observations, experiments, and models to reveal *networked* and emergent *systemic* characteristics. In other words, complex dynamical systems like living things can be understood *only* by also laying bare the spatiotemporal interplay of entities and processes as they relate to each other in response to a variety of constraints.

As unremarkable as those sentences sound today, for most of the twentieth century and even to date, professional philosophers of science and metaphysicians insisted on conceiving of the universe and our place in it in terms of minuscule and isolated particles of matter (atoms, and later sub-atomic particles) that forcefully collide into one another. This worldview was first articulated by Newtonian science and later secured – entrenched, in fact -- during the first decades of the last century by a school of philosophy called Positivism. Newtonian mechanics[i] bequeathed to philosophy the unexamined assumption that any complex entities and processes can be fully explained and predicted –reduced -- to fundamental entities (quarks and electron having replaced atoms) and the natural laws that govern *them*. From this perspective, collisions move particles in space but qualitative emergence is impossible. Phrased otherwise, a taken-for-granted corollary of this theoretical framework is that since reality is essentially particulate and thing-like, apparent unities like organisms and even the biosphere are in reality *epiphenomenal*, that is, causally powerless *as wholes*.

A central goal of this manuscript is to show that Western philosophy's longstanding refusal to acknowledge context-dependence – especially the possibility of emergence in response to context-

dependent constraints -- is an unavoidable consequence of this *atomistic, essentialist, and reductionist* worldview.

The successes of Newtonian science were undeniable and extraordinary. As a result, the assumptions on which it rested appeared indubitable despite the fact that experiments in quantum physics were yielding outcomes that raised questions about this dominant and mechanics-informed epistemology and metaphysics. The entrenchment of the Newtonian paradigm is lamentable, but understandable. Considering other alternatives would have meant incorporating context-dependent features like *organization* and *timing* into the heart of metaphysics. This openness in turn would have meant overthrowing the essentialist and atomistic presuppositions on which those metaphysics rested: that reality was particulate and the properties and powers of those stuff-like elements universal and unchanging. End of story. Most consequential of all, recognizing the significance of constrained interdependencies would have required questioning the exclusive reliance on the particular form of causality on which Newtonian science framed its natural laws. It would have meant, in other words, allowing other types of "cause-effect" relations in addition to *efficient causes*, those that transfer energy in billiard-ball fashion. The entrenched modern worldview at the time made any such metaphysical and epistemological alternatives inconceivable[vi] -- so in its wake it left dashed hopes of a theory of reality and knowledge that, by giving processes and constraints their due, recognized that "context changes everything."

Specifically, the bottom-up, atomistic essentialism shared by academic philosophers and physicists alike excluded from ontology and epistemology what philosophers call ***mereology***, those causal relations *between* parts and *wholes*.[v] As mentioned earlier, much of the reality we are most interested are those novel and relational properties of *interdependent* covariances, persistent and mutually dependent relations that arise in response to constraints create coordinated *coherent* wholes. These are not clumps, lumps, or aggregates but integrated units like cells, tissues, and organisms – each being defined by *sui generis* emergent properties. Such wholistic units are emphatically not block-like or merely stuck together: they are differentiated and articulated totalities that modulate and control their components even as these retain their individuality. Mitochondria within cells, for example, retain many of their characteristics even as they become integrated into (and regulated/modulated by) the cellular context in which they are embedded. Furthermore, such complex systems are networked dynamical systems that persist in a steady state *far from equilibrium*. Unlike slabs of terrazzo flooring, that is, such complex systems persistently *hang together as integrated units* – that is, as differentiated and articulated but integrated totalities away from thermal equilibrium. Their novel and defining properties arise from those interdependencies not, as Newtonian mechanics would have it, just from the massed *stuff* and energetic *forces* involved. Organisms

and cultures are two such complex dynamical systems characterized by the emergent powers and capabilities of those integrated interdependencies. But so are laser beams and superfluidity, galaxies and biospheres (which integrate both the abiotic and the biotic into a coordinated dynamic).

Most importantly of all for purposes of this monograph, such complex systems are *not epiphenomenal*: those emergent powers and capabilities top-down "change the go" of their components and even of the contexts from which they emerged. A naturalized strong emergence is a central feature of the new science of complexity.

But none of this fit in with the received worldview of Newtonian physics in the early part of the twentieth century, especially when buttressed by the classical notion of Thermodynamics as the inexorable tendency of the universe's energy to become more and more homogeneously distributed until it reached tepid thermal equilibrium (heat death) and the universe was completely devoid of energetic potential.

It is clear in hindsight that this received understanding of Newtonian mechanics left the Western theoretical worldview at an impasse: 1. The progressive and qualitatively novel complexification of the universe since the Big Bang –from quantum plasma to complex dynamics such as the Earth's biosphere, not to mention human minds and cultures – could not be accounted for. 2. This included the multitudinous varieties of human identity, including gender, race, socioeconomic class, culture, etc. – even when entrenched power politics of human social organization are set aside. The thesis that all these progressively more complex phenomena are just epiphenomenal froth sitting on top of an essential atomistic reality did not ring true. Even worse, 3) the received theoretical backdrop could not account for *axiology* –the domain of values, from aesthetic to moral. And it couldn't do so because (to come full circle) it couldn't explain – at any scale -- the etiology whereby emergent properties form. Specifically, it could not explain who 4) active lines of influence and constraint weave relations between individuals into a collective dynamic with interdependent and emergent properties. How do interpersonal relations, or relations between individuals and the legal or cultural system produce family dynamics? How does each dimension influence the others while simultaneously being influenced by them? How does activity at each level of organization modify and shape goings on at other dimensions so that components and dynamics continuously co-vary, co-adjust and co-evolve? The disenchantment of the world Max Weber bemoaned is a direct consequence of the intractability of this impasse

Ripples from this theoretical cliff reach deep into our lives even today. Those implications are at the heart of an essentialist, atomist, and reductionist zeitgeist consolidated by Positivism, the most influential school of philosophy at the beginning of the 20th century. The ripples reach into the way we frame debates about identity and individuation, as well as our understanding of systemwide dynamics such as families, organizations, and institutions. More generally, they have wreaked havoc with our

understanding of community and values because of Positivism's uncritically accepted principle that interactions with context and mereological relations are merely powerless froth atop the particulate core of reality. Apparently integrated wholes (like communities) as well as the emergent properties they manifest (like values) are in reality epiphenomenal and

As a result, most of the reality we deal with in our everyday lives was dismissed as nothing but epistemic constructs.

And there things stood for most of the last 125 years. All because philosophers and scientists stuck stubbornly to *modern* – that is, Newtonian -- presuppositions, especially with respect to the workings of causes and effects on the one hand and interactions and relations with the environment on the other. By laying bare the source of these ripples this monograph hopes to nudge our conceptual orientation towards a new perspective, one in which relations and mutualist interactions are as fundamental as elementary particles. Stephen Hawking proclaimed that the 21st century "will be the century of complexity." This monograph is written from the conviction that at the very least complex dynamical systems theory offers a novel perspective that can refresh philosophers' understanding of ontology and epistemology.

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Of course, complexity theory wasn't even close to being formulated at the beginning of the twentieth century when the Newtonian + Classical thermodynamics worldview became consolidated. Because living things do not conform solely to linear and deterministic cause and effect relations, biology was always the science most recalcitrant to being shoehorned into a mechanistic framework. Still, it would have been preferable for metaphysics and epistemology to have turned to biology for some lessons in mutualism, relations between organisms even of different species where both benefit. The interactions between individual organisms and the niches which they inhabit (such as for example, between plants and animals and their habitats, or between individuals and the families and social organizations to which they belong) are not solely billiard ball-like. They are two-way channels of energy, matter and information flow. Ecosystems have systemic properties that their individual component species lack.

Where do those systemic properties originate? Such collective properties are the products of stabilized and *constrained interactions* among individual entities in far from equilibrium conditions. Constrained interactions feed back and forth between individuals and the collectives they generate and in which they are embedded, with the output of one run feeding back into the next as refreshed initial conditions. Time and sequence suddenly matter, and recursive "strange loops" even more so. Relations between individuals and their families, or between employees and the organizations in which they work are therefore typically recursive and strange loop-like (than say like linear chains of dominoes). Unlike

Newtonian views of space and time as empty, featureless containers, the spatial and temporal context in which complex relations play out has a central role in generating and preserving unique systemwide dynamics. The terrain in which those linear chains of dominoes are set matters – a lot. Consequently, the structural and functional properties of ecosystems and family dynamics – of all complex systems in the strict sense -- are not reducible to the sum of the properties of the individual components.

I want to emphasize that complexity theorists are becoming increasingly convinced that analogous dynamics are at work in some aspects of the nonliving world as well as in living things (Philip Bell 2023; Matt Strassler 2024). Abiotic and biotic coherent networks also show self-organization in response to constrained interactions such as positive feedback loops and autocatalytic processes. It is these constraints that weave together erstwhile isolated and independent processes into interdependent and integrated wholes. That is what we mean by *complex systems*. By *complexity*. Even physics nowadays acknowledges that constrained and intertwined processes can generate novel and *complexly* strongly emergent dynamics like the lasers mentioned earlier. The novel qualities and powers of super-fluids and superconductors, of molecules and cells, the biosphere, biological ecosystems and social organizations from insects to primates --even human minds and cultures – are homologous examples of emergent parts-whole dynamics far from equilibrium.

To repeat: mereological powers are actively influential (shall we say causal?) but not as ***efficient causes*** as Newtonian mechanics would have it. Specifically: coherent dynamics far from equilibrium such as these are products of the interplay among ***types of constraints***. Once an integral whole coalesces in response to some forms of constraint, a novel feature of the world emerges. Complexity theory can explain why *More [sometimes is] is Different* (P.W. Anderson 1972). That emergent is not new stuff; it is an *emergent* dynamic. We must resist the temptation to reify: emergent complex systems are not new *things*. But then neither are they "other than" stuff and forces.

More precisely, novel emergent dynamics are novel ***constraint regimes***: real, *interdependent* and interlocking –and genuinely new -- powers and capabilities that arise *as stabilized and interlocking constraints*. By acting as ***constitutive and governing constraints top-down***, constraint regimes integrate components into complex wholes that can persist over time. Constraint regimes ***are*** not stuff; they are qualitatively different behaviors and properties that arise from the interplay of ***enabling constraints*** among erstwhile *independent* entities. Once the interdependence achieves closure, ***constraint regimes define*** those novel wholes; they sustain the way they "hang together" as coherent unities. The defining constraint regimes that comprise lasers and super-fluids, living organisms and social organizations, for example, preserve the overarching coherence of those emergent relational interactions by regulating, tuning, and modulating ***top-down*** the individual components and processes from which the interlocking

interdependencies that make up the coherent whole arise in the first place. It is in *that sense* that complex dynamical systems can be said to exhibit various degrees of self-regulation, autonomy, and agency.

Crucially and unlike massed aggregates, constraint regimes can exercise and display ***regulatory powers*** to influence top-down the behavior of the components that make them up and even of the contexts from which they emerged. It is in virtue of such mereological powers and capabilities that emergent constraint regimes of complex systems persist in a state of ***metastability,*** which state they embody by regulating and modulating components in response to the constraints of the ever-changing environment in which they exist. It is in *that sense* that complex dynamical systems exercise top-down causal powers.

Top-down causation has been a controversial philosophical topic for centuries, but complex dynamics finally offers a way to understand mereological relations where parts to whole and whole to parts relations are tractable – and all without violating principles of causal closure and conservation of mass and energy. All the while, moreover, these top-down mereological powers account for the possibility of ***standing causes***, for which Newtonian physics had no room.

Newton knew his theory couldn't handle the "three-body problem" – it couldn't precisely predict trajectories when three planets or stars interacted. We now know that three body problems arise whenever context enters the picture. Context-dependent constraints simultaneously create complex and irreducible entanglements of milieu and component; this manifests a processual and relational ontology that cannot be understood in terms of the old classical disjunction between Form and Matter (or Mass).

Enabling and governing context-dependent constraints we now understand weave their magic at every time scale and in every domain of reality -- physical, chemical, and biological. As Moreno & Mossio state, the "their doing is its being," to which I add, "with constraints serving as drivers of its doing."

To summarize: the universe's tendency to progressively self-organize into ever more complex and coherent units generates novel and emergent powers in open systems far from equilibrium. In response to constraints. The dynamics that emerge are not just the sum of the particles and forces that comprise them. They are *systems of constraints* (like virtual governors that keep metronomes mounted on a shelf synchronized) which display unexpected and qualitatively novel powers and capabilities (like synchrony) arising at each phase transition to a new integrated dynamic. Each novel capability is a manifestation of a new relational constraint regime. As yet another example, a new world of capabilities – what we call the biosphere – was created 2.3 billion years ago when blue-green algae called cyanobacteria catalyzed an oxidation reaction that released O_2 from seawater. Another new world of capabilities opened up when a bacterium first engulfed a mitochondrion and generated the novel constraint regime we know as

eukaryotes. Subsequently, and thanks in no small measure to a new enabling constraint, sexual reproduction, yet a third new overarching constraint regime, *lineages,* emerged as a result; *its* qualitatively novel property is *evolvability*.

Complex dynamics like these are not the effect of individual components added together– a laser is not massed-together individual photons. A eukaryote is not just two bacteria clumped together. As mentioned earlier, lasers are *integrated* dynamics; more precisely, they are *emergent* properties created when individual photons become *organized as pure waves*. The resulting wavey organization, remarkably, can cut, coagulate, and remove tissue, which the individual photon could not. Likewise, living things can reproduce and evolve because of their organized constraint regimes (genetic codes expressed or suppressed in response to particular environments and timing schedules – that is, in response to their attunement to local context-dependent constraints). When two cells integrated into a eukaryote there arose a novel type of entity – i.e., a novel type of constraint regime—arose, along with its concomitant emergent powers and capabilities. The biosphere too is a novel form of metastability that emerged from biophysical dynamics once organized into a novel constraint regime.

The lens of complexity theory open up conceptual room to conjecture that psychosocial processes (including human *cognitive* and *affective* processes such as symbolic thought and the emotions of compassion and vengeance) might likewise ***be*** such emergent properties, powers, and capabilities of constrained interactions among various anatomical structures, physiological dynamics and environmental conditions. Over evolutionary time, these constrained and interlocked collective dynamics– intertwined with each other as well as with features in the world –created progressively complex unities. As Robert Artigiani argues, complexity theory allows us to also hypothesize that ***moral values*** might likewise represent recently emergent qualities and novel capabilities of homologous, ever more complex interlocking social interactions among ever more complex biological organisms. All in response to the interplay of a variety of *types of* constraints. These are all novel and very real properties with active powers to bring about change. *Just not solely as efficient causes*. The hypothesized dynamic is spiral, but not repetitive. I speculate that it is an aspect of reality, not just an epistemological tool with which we organize and handle our experiences.

But to return to the conceptual framework in place during the last 125 years: By relying exclusively on efficient cause as the sole mechanism to bring about change, and on internal primary properties as the locus of *essence*, the entrenched theoretical framework was closed to the very possibility of mereology. Academics simply had no causal language with which to conceive of this sort of relational, integrative, and processual ontology; they had no language in which to articulate the systemic interdependencies and mutualist relations that generally characterize far from equilibrium complex dynamics. Efficient causes

can produce motion but on their own cannot bring about qualitatively novel and actively causal *types* of existents. *That* is why the received theoretical framework philosophers adopted from modern physics had to view interactions between individual entities (living or non-living) and the wider context in which they exist as *epiphenomenal*. It held that things that *appear* to be coherent wholes (like organisms) are in fact ultimately reducible to individual isolated particles careening about a featureless space of possibilities in response to forceful impacts. In time, all the jostling about would settle down into a final and homogeneous thermal state of white noise, the heat death of the universe.

That was the ruling picture of the universe especially in university philosophy departments until quite recently when non-linear, theories about far from equilibrium thermodynamics began to shake up the existing conceptual landscape with innovative ideas like *complex attractors* and *fractals* and a new theoretical framework with which to model these relations. Until then, however, the notion of coherent and integrative totalities arising from processes other than efficient causes got shoved back into the closet of philosophy and science for another century.

Readers should keep this new lens on ontology and epistemology in mind because it informs the critiques presented throughout this essay.

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The first part of this monograph examines the conceptual background and sociopolitical conditions that drove academic philosophy especially in Britain and the United States to this intellectual impasse-- with a particular focus on their negative consequences. As a case study, I propose we consider how and why luminaries of European philosophy like Bergson, Cassirer, Heidegger, Husserl, Merleau-Ponty, Kierkegaard, Nietzsche, Camus and Sartre, even Marx were systematically excluded from the North Atlantic canon of metaphysics, epistemology, and ethics. Likewise, for most of the last hundred years, Anglo-American university philosophy departments lumped together the philosophical schools to which many of these thinkers belonged --Phenomenology, Existentialism, Structuralism, Constructivism, Deconstruction, and Postmodernism -- as *Continental Philosophy*. All were then dismissed as belonging more in literature and psychology departments than philosophy proper. That same worldview categorized Americans Emerson and Thoreau as well as Spaniards Ortega y Gassett and Unamuno (along with Montaigne and Isaiah Berlin) as essayists, not philosophers. French Existentialists Sartre and Camus clearly belonged in the literature departments (just ask the Nobel committee!). Freud's theory of the superego was excluded from epistemology and relegated to the psychology department to keep company with Koehler's Gestalt Psychology and Husserl's Phenomenology. Most likely because his reductionism bottomed out at the scale of transactions on material production, Karl Marx was shunted into the political science and economics departments, where Marcuse, Lacan, Gramsci, and Althusser would keep *him* company a few years later. Down the hall but still in the general category of social science not philosophy,

Comte's ideas were safely ensconced in a new discipline, sociology, with an even newer subdiscipline, sociology of science, carved out a bit later for Robert Merton and Bruno Latour. More recently, the rest of the philosophical lot (Derrida, Deleuze and Guattari, and Foucault, to name the most prominent) were likewise dismissed along with Whitehead's Process philosophy, and for the same reason: they were thought to belong more to psychology or sociology than philosophy proper.

And on and on.

One needed only to ask PhD candidates in the process of deciding upon a dissertation topic at most universities in Britain and the United States at the time: you "specialized" in existentialism or continental philosophy at your professional peril. Even a homegrown American school of philosophy like Pragmatism was not taken seriously in its own country – until American philosopher Richard Rorty in the late 1970s returned some respectability to Pragmatism. But only barely, especially after Rorty veered off into advocating teaching empathy in the schools.

This is not ancient history. Even today, reductionist and deterministic approaches that echo a Newtonian mindset still predominate, in physics as well as philosophy (see Gillett 2016; Frank, Gleiser and Thompson 2024).

A second aim of this essay is to show how upon closer study it becomes clear that the excluded authors and schools of thought did have something in common: each in their own way *tried to bring context back into philosophy.* And so I begin with a careful analysis of arguments in favor of and against the Positivist movement of the early decades of the twentieth century, as well as of the philosophical heirs of Positivism begotten at Anglo-American universities (Emotivism and Prescriptivism, to name two). My purpose in each case is to point out how, repeatedly, objections to the received Positivist paradigm created an opening in which context might have been taken seriously, metaphysically and epistemologically. But North Atlantic Philosophy which, having been stripped of context by Positivism, did not welcome this approach. Instead, giving context a role was actively rejected. Doubtless because of Positivism's stated intent to emulate physics and thereby articulate a science-informed philosophy– one compatible with the dominant emphasis on atoms and the forces of efficient causality -- Anglo-American professional philosophers simply doubled down on Positivism's uncritically accepted presuppositions. *The Blind Spot* (2024) brilliantly chronicles this lacuna. In consequence, by mid-century, *modern* presuppositions about metaphysics and knowledge acquisition had become entrenched as the foundational worldview in academic circles; it functioned as the background "that goes without saying."

Historian of science Robert Artigiani narrates (2023) how, in contrast to what was going on in professional philosophy, working physicists on the European continent during the first half of the twentieth century struggled mightily to make sense of flagrantly context-dependent spookiness in the

quantum realm. Entangled particles and superposition were already muddling experimental outcomes but self-described Positivists like physicists Born, Einstein, and Heisenberg explicitly refused to turn away from that philosophical worldview. Not so Niels Bohr, whose choice of the ying/yang symbol on his Danish coat of arms, was met with raised eyebrows. Einstein explicitly renounced Positivism, but his realist metaphysics presupposed a concrete form of ontology based on localized particles. Academic philosophers followed suit, holding fast to the belief that the weird paradoxes thrown off by the quantum world would in the end get sorted out and science would settle down with a clean and reducing theory of elementary particles propelled by forceful causes. Even decades later, only a few writers of fiction such as American John Barth and Colombian Jorge Luis Borges had hazarded the leap to address quantum puzzles (See Eggington's sparkling *The Rigor of Angels* (2023) for parallels between Kant, Heisenberg, and Borges).

Meanwhile, back at the philosophical ranch as we will see, the modern perspective ensconced at Oxford University 50 years earlier had declared that only the methodology of analytic philosophy qualifies as Philosophy – and Borges and Barth's fiction was definitely not that. The few courses on Philosophy in Literature (Sartre, Ibsen, Tolstoy) or in Philosophical Anthropology (Ernst Cassirer, George Herbert Mead) sprinkled across American campuses –taught by secure tenured professors, to be sure – might be delightful. But they were definitely not philosophy. Not metaphysics; not even ethics. To paraphrase Kant's comment over a century earlier, bringing context into philosophy would turn philosophy into sociology. God forbid.

Consequently, for pretty much all of the 20th century and still to date, interdependence with the environment, with the milieu, the umwelt, the niche or habitat – call it what you may -- went unseen, ignored, or dismissed by professional philosophers in the Anglo-American academy who were mostly intent on emulating the conceptual framework and methodology of Newtonian mechanics.

Ignored, that is, except, that is, by four Englishwomen who did try to bring "philosophy back to life;" who attempted, in effect, to bring the full context of a lived life back into professional philosophy. The story of Gertrude Anscombe, Philippa Foot, Iris Murdoch, and Elizabeth Midgley at Oxford University 1939-1942 will provide the second case study: their private and professional lives are beautifully recounted in three recent and critically acclaimed books: *Metaphysical Animals: How Four Women Brought Philosophy back to Life*, *The Women are Up to Something,* and *A Terribly Serious Adventure*. First as students in the early years of WW2 and then intermittently as tutors and fellows after the war, the four women struggled,

> "To bring philosophy back to life, back to the context of the messy everyday reality of a human life lived with others. Back to the deep connection that ancient philosophers saw between Human Life, Goodness, and Form. Back to the fact that we are living organisms,

whose nature and habitat shapes the way we get on and flourish or wither in the world." (MacCumhaill & Wiseman)[vii]

These four so-called "metaphysicals" were concerned not only with what constitutes a life well lived; they reflected on how the complex natural and social environments in which they were immersed contribute to, afford, stymie, and in general shape a life well (or poorly) lived. Stated in the professional language of the era, the women understood that the fact-value distinction, first formulated by Hume and later consolidated by Positivism, was untenable. Context leaks into the lives of individual human beings and contributes to the likelihood that they will or will not act in a certain way. And what the consequences for their lives will likely be, for good or ill. Context might not determine behavior 1:1 as Newtonian collisions were assumed to do, but it is undoubtedly a strong influence. How does *that* work? But the philosophical establishment of the day dismissed them as *metaphysicals* precisely because Positivist philosophy had no room for mereological relations. Much less context-dependent causal relations. Fact and value were uncritically assumed to be non-overlapping domains – with each other and with the enveloping empirical reality.

The second part of this monograph will therefore be devoted to a closer examination of the philosophical contributions of these four philosophers who, according to one of their male colleagues were "*up to* something." Indeed they were. They were *on to* something! Our metaphysical women were trying to bring philosophy… back to all the interlocking interdependencies between human beings and the natural and symbolic worlds to which they belonged. *Belonged* – not just *were plunked into* – a relation very different from an atom in the empty vessel of Newtonian space and time. They tried to bring philosophy back to life. Back to the moral values that emerge from those interdependencies that constitute Wittgenstein's Forms of Life. These four very good friends understood that only by taking the rich and multidimensional tapestry of a full human life seriously can the interlocking and intertwining of empirical fact with moral value be made tractable. Their work set the stage for the later formulation of Virtue Ethics, Environmental Ethics, and a reconceptualization of Agency and Human Action.

The four changed the direction of Philosophy for decades to come. Alas, they were only partially successful in accomplishing their goal of breaking down the distinction between facts and values. In detailing their arguments against the Positivist worldview, the last section of the monograph will describe how the four women simultaneously struggled against -- but also reflected -- the history of 20th century philosophy. The received understanding of cause-effect relations, especially the prohibition against mereological causes and effects, was just too entrenched in professional philosophy circles to accept a new synthetic account of the interdependence of fact and value:

It would take another one hundred plus years for the Anglophone Academy to address the problem.

[i] There is some debate about whether this framework represents Isaac Newton's own worldview.