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Aristotle has been making a comeback in contemporary philosophy. In a process that began in the second half of the 20th century, mostly in ethics, and spread over time to the various areas of philosophy, from metaphysics to the philosophy of science, several philosophers are beginning to self-identify as "Aristotelian" or "neo-Aristotelian". This movement, now growing past its embryonic phase, has been offering diverse and valuable contributions to various debates in analytic philosophy. Curiously, one of its most unlikely contributions is to be witnessed within the philosophy of biology, an area where Aristotle had been deemed, for some time now, long dead and buried. That Aristotle lives, moreover, is William M. R. Simpson's *Hylomorphism* central claim. Released as part of the Cambridge Elements compendia on the philosophy of biology, *Hylomorphism* is at once brief and profound. In just over sixty pages, Simpson offers a short history of hylomorphism (chapter 1), a categorization of its contemporary strands (chapter 2), and an innovative analysis of its relevancy in the philosophy of physics (chapter 3) that lays the foundation for an evaluation of its applicability in the philosophy of biology (chapter 4); all of this expounded with remarkable conciseness, providing an overview of the *status quaestionis* whilst venturing it into previously uncharted territory.

The book starts with a genealogy of hylomorphism, its fall and rise (chapter 1). Simpson retells the usual story: having dominated philosophical thought from antiquity up until the high Middle Ages, hylomorphism was discarded by the moderns alongside the broader Aristotelian system. The progressive "fragmentation of the unity of substance and physicalisation of the concept of matter" (p. 7), with its roots in late medieval philosophy, ushered a change in modern philosophical sympathies, now aligned more with Democritus than with Aristotle, embracing a corpuscularian/atomistic understanding of matter, wholly devoid of form. Simpson contends that analytic philosophy is

a direct heir of this philosophical and scientific revolution, as can be seen in its championing of a sparse, minimal ontology that is in line with our "best physics". This paradigm, however, is being recently reevaluated, as it becomes clear to some that maybe "the scientific revolutionaries threw the metaphysical baby out with the bathwater when they rejected the metaphysics of Aristotle along with his antiquated physics" (p. 11): emergent phenomena, the failure of reduction and microphysicalism, the revival of essentialism, the turn to practices in philosophy of science; all have all played a part, Simpson argues, in the recent reassessment of hylomorphism.

One of the key contributions of the book, which implicitly animates the entire project, lies in granting a definite and irreducible place to biology and its object of study. Simpson aptly notes that the philosophy that effectively subdued hylomorphism may have "exaggerated the unity and universality of physics" (p. 12), mistaking arbitrary methodological limitations for ontological realities, and taking as given what were, in fact, value-and-theory-laden interpretations of physical phenomena. In "providing an alternative characterisation of the ontological relationship between physics and biology" (p. 13), and ultimately, between physics and ontology, hylomorphism is thus able to resist physicalist reductions of biological organisms and evade supervenience, granting the existence of real, irreducible biological powers.

It is the search for an ontology that provides space for biological substances, to be distinguished from mere heaps, and that can have real causal influence in the world, that thus guides Simpson's categorization of the various forms of hylomorphism (chapter 2). As with any movement that grows into maturity, queries about self-identity inevitably arise, and Simpson makes a particularly relevant contribution to the neo-Aristotelian movement's self-understanding. The various modern strands of hylomorphism are organized around two axes: first, those who understand matter and form as metaphysical constituents (such as Koons, Jaworski, and Koslicki) and those who understand matter and form as metaphysical concepts (such as Marmodoro, Fine, and Johnston); then, those who embrace a powerist ontology (Koons, Marmodoro, and Jaworski) and those who embrace a non-powerist ontology (Koslicki, Fine, and Johnston). This new taxonomy, on top of providing some much-needed nuance on previous attempts at similar categorizations, also clarifies the specific version of hylomorphism that Simpson believes more suitable for a hylomorphic philosophy of biology:

a constituent-based, transformative version of hylomorphism grounded in a powerist ontology.

The non-powerist and concept-based hylomorphisms are rejected because Simpson is interested in a version of hylomorphism that robustly distinguishes natural substances from artifacts and takes matter and form to actually contribute to the physical being of a substance; the transformative aspect, contra a merely structural approach to hylomorphism, in turn, follows from two concerns: 1) maintaining the unity of the substance, and 2) avoiding the charge of causal overdetermination. A transformative conception of hylomorphism successfully establishes 1) by arguing that all the powers of the parts of a substance are grounded and depend on a single substantial form; and avoids 2) by showing that, upon "transformation", physical entities cease to have the "same force-generating powers they possessed in the wild" (p. 43), that is, novel irreducible powers emerge when the parts are caught up in a substantial whole.

How exactly hylomorphism can avoid 2), the charge of causal overdetermination, is established by a deep look into the philosophy of physics (chapter 3). Therein lies the book's greatest contribution: Simpson's response to Kim's causal exclusion dilemma. This problem has plagued the various forms of modern hylomorphism (Howard Robinson (2014, 2021) has built an entire argument against hylomorphism on its basis) and was yet to get a fully fleshed successful response – for instance, Tabaczek's (2019: 80-81) appeal to understand strong emergence and downwards causation in terms of formal causation rather than efficient causation was bound to only convince the ones already in tune with the general Aristotelian causal schema.

The crux of Kim's argument is that there can be no difference in the higher-level phenomena without a difference in the basal – physical – phenomena; as such, the former is fully determined by the latter. Emergent properties are precluded from having any top-down causative effect on their own physical basal properties. The threat of causal overdetermination insulates the lower-level physical phenomena.

What Simpson masterfully demonstrates is that such an argument, relying on the causal closure of the physical, does not, as its proponents often think, follow from physics. The priority of the microphysical expounded by Kim, Simpson argues, is not a physical given. When one actually looks into our best theories of the microphysical, in the case, quantum mechanics, microphysicalist claims fall apart: "The notorious 'measurement problem' of quantum mechanics […] remains an open problem in the interpretation of

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quantum mechanics precisely because of the role that macroscopic measurements seem to play in modifying the microscopic behaviour of physical systems" (p. 36). As Simpson explains, the dynamics of the wave function are at odds with microphysicalist expectations: a quantum system evolves over time linearly according to the Schrödinger equation, but upon measurement, the wave function collapses, no longer adhering to the Schrödinger equation; yet, such discontinuous modification could not have been predicted by the evolution operator of the wave function. On top of that, amongst the theories that account for such collapse, Simpson highlights a new model, the Contextual Wavefunction Collapse (CWC) interpretation, proposed by Barbara Drossel and George Ellis, that explicitly "drops the assumption that the temporal development of every microscopic system in nature is causally closed under exactly the same microscopic dynamics" (p. 39), proposing instead that "the quantum measurement issue can be resolved by carefully looking at top-down contextual effects within realistic measurement contexts" without the need to insert "an ad hoc term into the Schrödinger equation […] as in other derivations" (Ellis 2018, 11661). CWC, Simpson argues, provides us with a framework for understanding how higher-level properties, characteristic of the macroscopic context, influence the dynamics of quantum systems. This shows, contra Kim, that higher-level properties are not in fact overdetermined and redundant but powerful. Against the priority of the microphysical, Simpson proposes "the priority of the macrophysical" (p. 41) according to which "the macrophysical entity is the fundamental physical entity, and the powers of its microscopic parts are grounded in the macroscopic entity as a whole" (p. 42).

In giving a plausible account of how even in microphysics, higher-level phenomena shape the lower-level in non-determinate and unpredictable ways, Simpson successfully avoids Kim's argument, laying a solid foundation for anyone trying to establish an anti-reductionist edifice in philosophy. What is not so obvious, though, is whether this edifice has to look hylomorphic. Simpson rescues "strong emergence" and "top-down causation" from Kim's hostage, but it is not clear how those concepts would fit in hylomorphic garments. For instance, is "top-down causation" the same as formal causation? Or is it another form of efficient causation? Did Kim's argument even apply past efficient causation? How can "strong emergence" be grounded in hylomorphic terms? These are some of the questions that emerge from Simpson's response to Kim. While some have received tentative

answers, they primarily serve as signposts toward challenges that hylomorphists will need to delve deeper into.

The final ingredient in Simpson's hylomorphic recipe for biology is teleology. Having salvaged the macroscopic from the threat of overdetermination, Simpson then argues that a key feature of substances such as living organisms is a natural end-directedness that distinguishes them from mere heaps of matter (chapter 4). This end-directedness is, of course, non-intentional and fully intrinsic to the substance – not imposed "from above", so to speak – and can be grounded, Simpson argues, in a "constituent-based form of hylomorphism, in which substances of the same nature can be unified by their substantial forms" (p. 64) that escapes the various problems found in etiological theories of normativity.

Finally, contra the somewhat common assertion that hylomorphism is inescapably tied to a rather petrified essentialism that is, in turn, inimical to evolution, Simpson argues that the new "extended evolutionary synthesis" creates space for a more thoroughly Aristotelian stressing of "individual organisms and their capacities" (p. 59) rather than populations, as was the case with the previous "modern synthesis". This is where the book's length comes at a higher cost, especially to those expecting a more thorough treatment of the philosophy of biology. Given Simpson's rather deep dive into how physics itself affords hylomorphic interpretations, one would expect the same treatment for biology. Simpson mentions how the "modern evolutionary synthesis" lends itself to hylomorphic interpretation, but there is a plethora of other developments in biology that are moving in a similar direction. For instance, the rise of evo-devo, Denis Noble's work in systems biology – that actively defies the reductionistic "DNA makes RNA, and RNA makes protein" dogma – could have been considered and would further strengthen Simpson's argument. Of course, this attests more to the limits of the format in which the argument is laid out than to the limits of the argument itself.

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