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## CRITICAL STUDIES/BOOK REVIEWS

Gila Sher. *Epistemic Friction: An Essay on Knowledge, Truth, and Logic*. Oxford University Press, 2016. ISBN: 978-0-19-876868-5 (hbk). Pp. xviii + 370.

Reviewed by **Julian C. Cole\***

Gila Sher believes that our *basic epistemic situation* — that we aim to gain knowledge of a highly complex world using our severely limited, yet highly resourceful, cognitive capacities — demands that all epistemic projects be undertaken within two broad constraints: epistemic freedom and epistemic friction. The former permits (and encourages) us to employ our cognitive resourcefulness fully while undertaking epistemic projects, while the latter requires that such projects always be substantially grounded in both the mind and reality. *Epistemic Friction* is an exploration of the latter constraint — the former being left for later work — that demonstrates the complementary nature of three projects that Sher has been working on, largely independently of one another, over the past three decades: a dynamic, neo-Quinean model of knowledge, a substantivist theory of truth, and a foundation for logic. More specifically, in *Epistemic Friction*, she expounds an integrated theory of knowledge, truth, and logic that draws on and deepens her earlier work on these three topics. While readers of this journal are most likely to be interested in two specific components of this book — an indirect correspondence theory of mathematical truth (see Chapter 8, Section 4) that Sher uses to illustrate her manifold correspondence theory of truth (see Chapter 8) and a foundational account of logic (see Chapter 10) — they would be well served by exploring it in its entirety, for while I will argue that its main ideas are unlikely to be correct in their current form, it is certainly both insightful and engaging. Indeed, at nearly every stage, Sher provides a novel and thought-provoking interpretation of well-known issues and literature in all three of the aforementioned areas.

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This review proceeds as follows. In Section 1, I offer a summary of the main ideas of Sher's book, which, unfortunately, can neither cover all of these ideas nor do full justice to those that it does cover. In Section 2, I offer a significant challenge to these ideas.

### 1. SUMMARY

In Part I: Epistemic Friction, Sher explicates the notions of epistemic friction and epistemic freedom, with a greater emphasis on the former than the latter, and outlines a new foundational epistemic methodology which she calls foundational holism. The notion of epistemic friction has its roots in the work of numerous philosophical figures, of whom Sher emphasizes Kant, Wittgenstein, and McDowell. She characterizes her own understanding of such friction using seven principles (pp. 9–12):

- (1) The general problem of epistemic friction is the problem of setting adequate constraints on our system of knowledge so as to avoid empty theories and maximize genuine knowledge.
- (2) A central constituent of epistemic friction is the requirement that our system of knowledge be well grounded. This requirement has two parts: (a) our system of knowledge must be grounded in reality or the world, and (b) our system of knowledge must be grounded in the mind. Groundedness in the world is veridicality, *i.e.*, compliance with substantial standards of truth, evidence, and justification. Grounding in the mind might include conformity with transcendental principles (Kant), compliance with inculcated principles of rationality (McDowell), and agreement with rules of language (Wittgenstein). But it also importantly includes other things as noted in principles (5) and (6) below.
- (3) The grounding of knowledge in the world is not necessarily restricted to experience. Knowledge has to be grounded in reality, and while experience undoubtedly plays an important role in its grounding, the nature of the grounding reality and the grounding mechanisms is an open question. In particular, the possibility that knowledge is partly grounded in non-experiential facets of reality, or that the grounding mechanisms are partly non-experiential, is not ruled out.
- (4) The grounding of knowledge in the mind has two aspects, passive and active. Knowledge is grounded in built-in or naturally developed principles of cognition; but it is also grounded in principles freely, intentionally, and critically developed, selected, and/or decided upon by us.
- (5) Knowledge is grounded in the mind in a broad sense, both on the voluntary and on the involuntary level. On the voluntary level it is grounded in methodological, theoretical, and pragmatic-practical principles, from unity, systematicity, economy, and veridicality (thought of as a norm created by the mind) to simplicity, economy, and practical applicability. On the involuntary level it is grounded in physical, biological, psychological,

and possibly transcendental principles. And on a mixed, partly involuntary, partly voluntary level, it is grounded in social, political, linguistic, and other principles.

- (6) A central friction requirement is substantiveness: the setting of high standards of discovery, explanation, justification, informativeness, depth, theoretical significance, rigor, systematicity, intellectual interest, and the like for all theories in our system of knowledge.
- (7) The central friction requirements — groundedness in reality (veridicality), groundedness in the mind, substantiveness, *etc.* — are universal. They apply to, and are in principle satisfied by, our system of knowledge as a whole and each of its branches individually. This includes logic, philosophy, and mathematics, along with the social and natural sciences.

Sher's new foundational epistemic methodology is built around two principles (p. 24):

- (1) Every branch of knowledge, *qua* branch of knowledge, requires a substantial grounding in reality, *i.e.*, justification of its veridicality.
- (2) The grounding relation need not be strictly ordered.

These principles reflect that, for Sher, there is no inherent connection between grounding our system of knowledge in reality and doing so in a strictly ordered manner. Thus, Sher's project is *foundational* without being *foundationalist*, *i.e.*, she provides a critical, explanatory, and largely normative theory that tackles the central epistemic question of whether, to what extent, and how humans are in principle capable of acquiring knowledge, and what constraints such knowledge should satisfy, without adopting what she takes to be the flawed foundationalist methodology of requiring a strictly ordered grounding for such knowledge. By placing no preconceived demands on the order in which epistemic grounding is conducted nor on the resources used in such grounding, Sher's foundational holism is both highly flexible and somewhat more demanding than its foundational predecessors, where the increased demand is a consequence of requiring a grounding for *every* branch of knowledge. It should also be noted that, in contrast to Quine's well-known single-unit holism, Sher's foundational holism is structural in that it regards our system of knowledge as a structured network of relatively independent, yet interconnected, units. More formally, Sher (p. 28) maintains that:

- (1) Foundational holism involves, in addition to the *traditional* holistic idea of a rich network of connections *among units of knowledge*, the *new* idea of a rich network of connections *between units of knowledge and reality*.
- (2) Foundational holism not only *permits* connections between units of knowledge and reality . . . , it makes such connections *mandatory*. And it makes them mandatory not just for some, but for *all* branches of knowledge.
- (3) Although foundational holism regards knowledge as grounded not just in reality but also the mind, it never regards the grounding of knowledge

in the mind as a substitute for its grounding in reality. All knowledge is grounded both in reality and in the mind, and the former is *integral* to its *veridicality*.

In Part II: A Dynamic Model of Knowledge, Sher delineates a general model of knowledge. Her starting point is Quine's model in 'Two Dogmas of Empiricism' [1951], which she takes to have the positive features of recognizing a significant interface with both the mind and reality (center and periphery), of being richly holistic by acknowledging an elaborate network of connections between diverse units of knowledge, and of rejecting the traditional division of units of knowledge into those grounded in reality and those grounded *solely* in the mind. Yet Sher finds Quine's model lacking in two important respects: (i) the structure of Quine's model is overly static in virtue of its taking the center and the periphery to be fixed and (ii) Quine's understanding of the center and the periphery are too narrow. By contrast, according to Sher, 'center' and 'periphery' should be understood as job descriptions occupied by different items at different times and during different epistemic investigations, reality should be understood as incorporating features that Quine's model ignores (*e.g.*, formal, abstract properties), and the mind, far from playing only the kind of pragmatic role assigned to it by Quine's model, embodies numerous resources for use in discovering and justifying knowledge.

Accordingly, in developing her model of knowledge, Sher seeks to provide a model that possesses nine important characteristics (p. 40):

- (1) A systematic yet flexible structure.
- (2) A broad, significant interface with reality.
- (3) A broad, significant interface with the mind.
- (4) A rich, holistic network of interconnections, encompassing both connections among units of knowledge and connections between units of knowledge and reality.
- (5) Non-bifurcation of units of knowledge into units grounded in reality and units grounded in the mind (or units substantially grounded in reality and units exclusively grounded in the mind). All units of knowledge are substantially grounded in both.
- (6) A broad, yet substantial conception of mind, reality, unit of knowledge, truth, evidence, and justification.
- (7) High standards of substantiveness and veridicality for all disciplines.
- (8) A flexible and dynamic conception of epistemic inquiry.
- (9) A significant role for active freedom in the project of knowledge.

By way of clarifying characteristic (8), note that Sher's model of knowledge is dynamic in the following sense: it allows for movement of cognitive elements within it from the center all the way to the periphery and *vice versa*, where this movement is typically in two dimensions — time and context. Diachronically, such movement of our concepts, statements, and theories is a consequence of their changing in response to changing circumstances. Synchronically, such

movement of our concepts, statements, and theories is a consequence of their falling within a multiplicity of contexts that place them in different positions in the model.

Sher's model of knowledge has important implications for a variety of traditional philosophical dichotomies. For instance, it promotes a view of reality that is neither Platonist nor nominalist, where these are opposing views concerning the existence of abstract objects. Rather, it accepts that there is a single reality that possesses both experiential and abstract features, where features of both kinds serve to ground particular branches of knowledge. Sher's model also rejects the rationalism-empiricism and the *a priori-a posteriori* dichotomies. It maintains that human intellect plays a central role in *all* of our knowledge, that our intellect and sensory perception are two essential, yet interconnected, elements in *all* such knowledge, and that the respective contributions of our intellect and sensory perception to particular branches of knowledge vary along a continuum, with some branches, which Sher labels quasi-apriori, relying very heavily on our intellect and others relying very heavily on our sensory perception. Moreover, in terms of the realism-anti-realism dichotomy, Sher's model embeds a robust form of realism that regards an independent reality as both the target and ground of all human knowledge, yet is more flexible than most forms of realism in its understanding of the ways in which particular theories can be connected to this reality.

Among other things, Sher's model of knowledge requires a substantive theory of truth. In Part III: The Structure of Truth, she provides such a theory. After considering and rejecting various reasons for adopting a deflationary approach to truth, Sher outlines a substantivist theory by way of two core principles and a third universal principle, all of which she obtains by adopting a cognitive rather than linguistic perspective on truth.<sup>1</sup> As a preliminary to understanding the first of these principles, observe that, as Sher uses 'immanent', 'transcendent', and 'normative', thought/cognition that is directed at the world from within a particular theory or point of view is in the immanent mode, thought/cognition that moves beyond a particular immanent mode of thought/cognition and takes into consideration both that thought/cognition and the world is in the transcendent mode, and thought/cognition that critically evaluates the relationship between thought/cognition in the immanent mode and the world is in the normative mode. Moreover, according to Sher, thought/cognition in the transcendent mode need not be from a 'God's eye' point of view; the adopted point of view, while in some respects more powerful than the immanent one, can still be wholly human. As Sher (p. 166) explains, transcendence 'is something quite simple and commonplace, like ascending to a *Tarskian metalanguage* (metatheory) or moving 'sideways' to *another* (e.g., *background*) *language* or *theory*.'

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<sup>1</sup>The difference between the first two principles and the third lies in the fact that the former 'capture something very *basic* and *general* at the core of truth, something central to *all* truths' (p. 218), while the latter 'is concerned with a *partial* and *highly specific* determinant of truth, one among many other determinants' (p. 218).

With these preliminaries in place, Sher's first core principle of truth — the *fundamental principle of truth* — states that (p. 171):

- (1) Truth arises in the cognitive environment of three basic modes of human thought: the immanent, transcendent, and normative modes.
- (2) Truth is a transcendent standard or norm for immanent thoughts, a standard of measuring up to reality for such thoughts, or of giving a positive answer to 'the question of truth' — the question of whether things are as a given immanent thought says they are — as it applies to such thoughts.

Sher's second core principle of truth — the '*manifold*' *correspondence principle* — states that:

Truth is a matter of a substantial and systematic connection between thought and reality, a connection that has to do both with the way the world is and the way our mind operates. This connection might be quite intricate and take different forms in different fields. The forms it takes depend both on what aspect of reality a given thought targets and on the cognitive resources available to us for reaching it. Abstracting from differences, this connection holds between a given thought and reality when the aspect of reality it targets is, directly or indirectly, yet systematically, as it says it is. (p. 186)

Accordingly, while truth arises from there being a systematic connection between thought and reality, the said connection can take manifold forms, where the fact that it can take manifold forms allows us to exercise our epistemic freedom in constructing a bridge between thought and reality. Indeed, Sher (p. 189) claims that manifold correspondence possesses three distinctive features:

- (A) Correspondence is, in a deep sense, a matter of both world and mind.
- (B) Correspondence need not have a simple form, like mirror, copy, or isomorphism; it might have a far more intricate form.
- (C) Correspondence might take several forms, varying from field to field.

As for Sher's third principle of truth — the *logicality principle* — it states:

*Logical structure* is a central factor in rendering sentences true or false, a factor that works in the same way in *all* fields of truth. (p. 218)

While different in kind from the previous principles in virtue of concerning a partial and highly specific determinant of truth, Sher includes discussion of this principle in her account of truth because 'this determinant is uniquely important, lying, as it does, at the root of a powerful and systematic method of inference essential to knowledge' (p. 218).

To illustrate and illuminate feature (B) of manifold correspondence, Sher provides a discussion of mathematical truth, with an emphasis on arithmetical

truth. She begins by asking whether there are aspects of reality that, to be captured correctly, would require a discipline like pure mathematics. Her answer is ‘yes, the *formal* features of objects and properties’, by which she means the features of objects and properties that are invariant under all one-to-one and onto replacements of objects by objects (*e.g.*, self-identity and cardinality properties, such as the second-level cardinality property of being of cardinality THREE). Such features, Sher notes, attach to objects and properties simply in virtue of their being objects and properties. Accordingly, they attach to all possible objects and properties, not merely to real/actual objects and properties. Moreover, it is clear that there are regularities and laws that govern the formal features of reality (*e.g.*, laws governing self-identity and the ordering of cardinalities), which, in virtue of the aforementioned, possess a modal force strong enough that their adequate representation requires a discipline as modally strong as pure mathematics. Sher further notes that:

... if mathematical theories (or some mathematical theories, or significant parts thereof) are theories of the laws governing the formal features, or formal behavior, of objects in the world, then these theories (or significant parts of these theories) are true or false in the *correspondence* sense, broadly understood. If, and to the extent that, the laws of, say, our current arithmetic theory are — directly or indirectly, but in a systematic manner — the laws governing the relations between finite cardinalities in the world, then current arithmetic is true to reality. In other words, if, and to the extent that, current arithmetic or set theory is committed to a correct description of the laws governing real cardinalities, then its standard of truth is a *correspondence* standard. This, however, does not mean that its correspondence with reality is *direct*. It is an open question *how* (in what manner, exemplifying what pattern) true mathematical theories do, or might correspond to reality, what the route of mathematical correspondence is or might be ... (pp. 198-199)

Following up on the last two sentences of this quote, Sher (p. 199) next observes that ‘analysis suggests that the level at which cardinalities ... arise in reality is the level of properties of properties, but in modern arithmetic and set theory cardinalities are individuals’. This, she correctly observes, presents us with a puzzle: if formal features of reality typically reside at the level of properties of properties, why, in mathematics, are they typically studied as individuals? Her answer is provided in this passage:

... [humans] seek to know things about the world which might not be directly accessible to us. How do we go about it? That depends on how our cognitive apparatus, and in particular our intellect, works. Suppose we are so constituted that our intellect works more effectively when we deal with systems of individuals than with systems of higher-order objects. Suppose the most natural or effective way for us to make discoveries and develop theories of any subject matter (or of formal subject matters, or

of certain formal subject matters) is to do so on the first-level; we may be better at discovering formal regularities and constructing systematic theories of such regularities when we think of them as involving individuals rather than higher-level properties. Our cognitive tools — especially our intellectual tools — may work better in a first-level setting than in a higher-level setting. Now, if reality itself does not supply us with a first-level formal setting, we can exercise *epistemic freedom* and create a first-level setting for studying the formal by ourselves. We can use our imagination, creativity, ability to discover (or figure out) relations between phenomena, *etc.*, to construct a first-level model . . . of reality, or of those parts/aspects of reality we wish to study. This enables us to develop a first-order arithmetic theory that gives a correct, albeit indirect, account of cardinalities in the world. Arithmetic, in that case, describes the laws governing cardinalities by describing laws governing their first-level simulations. The key idea is that while the subject matter of mathematics (or significant parts of mathematics) is external — mathematics seeks to discover formal laws governing *reality* — mathematics is a *discipline created by and for humans*. As such it might reach the world in ways that are advantageous for humans but circuitous from the point of view of correspondence. Such a correspondence can be as *accurate* and *systematic* as direct correspondence in spite of its roundabout nature. Laws of arithmetic and set theory may not be connected to reality through the same route as laws of other sciences, yet they might be connected to it just as deeply. (p. 200)

While Sher never formally discharges the suppositions in this passage, she clearly believes that our cognitive tools do work better when they deal with systems of individuals and their properties rather than systems of higher-level facets of reality. Accordingly, in mathematics, we postulate fictional<sup>2</sup> individuals with appropriate properties that are systematically connected with real second-level properties and their third-level properties. Consequently, mathematical reference to and correspondence with reality is indirect or composite. On a surface, simple level, mathematical singular terms refer to (posited) mathematical individuals, the variables of mathematical quantifiers range over such individuals, and mathematical predicates refer to the properties of such individuals. On a deeper, composite level, mathematical singular terms refer to second-level properties, the (first-level) variables of mathematical quantifiers range over such properties, and mathematical predicates refer to the third-level properties of such properties. Thus, we have the idea of an indirect correspondence between mathematics and reality and a second instance — over and above the standard one — of the manifold ways in which thought can

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<sup>2</sup> Throughout most of her discussion of mathematical individuals, Sher simply refers to them as posits and provides few details concerning the ontological status of posits. Yet, on page 210, she uses the term ‘fictional’ to characterize constructed/created posits.



correspond with reality. We also have the outlines of an account of mathematical truth that Sher argues shares some themes with a number of earlier accounts of such truth (*e.g.*, those of Aristotle, Frege, Quine, and some contemporary fictionalists) and provides answers to many of the philosophical puzzles that have plagued philosophical accounts of such truth. Such puzzles include what Sher calls the identity problem, the applicability problem, the modal force problem, the large ontology problem, the cognitive-access problem, and the ‘mathematics as algebra’ problem.

Logic, as Sher conceives of it, is a branch of knowledge. Indeed, given the role that it plays in other branches of knowledge, it is an extremely fundamental and important branch of knowledge. Given Sher’s foundational commitments, this means that, like all branches of knowledge, logic requires a foundation. Consequently, Part IV: *An Outline of a Foundation for Logic*, is devoted to a foundational project that few of a foundational bent have even attempted: outlining an appropriate foundation for logic. The problem for most, and the reason why so few have undertaken this type of foundation project, is understanding how logic could be grounded in reality. Sher’s answer is simple: logic, like mathematics, is grounded in the formal features of reality. Slightly more formally, Sher defends three theses concerning logic:

*Thesis 1: Function (Task) of Logic* (p. 255):

Logic’s task is to develop a method of inference which is both highly general and has an especially strong modal force. More specifically, its task is to develop a method for constructing inferences that transmit truth from sentences to sentences with an especially strong modal force and regardless of field of knowledge.

*Thesis 2: Mind and World* (p. 259):

Logic is grounded (requires a grounding) both in the mind and in the world, and these grounds are interconnected.

*Thesis 3: Logic is Grounded in Formal Laws* (p. 271):

Logic (logical consequence) is grounded in formal laws governing reality — laws governing formal features of objects and properties — and it is the broad applicability and strong modal force of such laws that underlies (and explains) the generality and strong modal force of logic.

While the idea of formality, understood in terms of the notion of invariance, is raised and employed during Sher’s discussion of mathematics, it is not until Chapter 10 that the details of this notion are fully explicated. It is also at this point that Sher explains how grounding logic — and, by parallel arguments, mathematics — in the formal features of reality accounts for its generality,

necessity/strong modal force, topic neutrality, abstractness, basicness, strong normativity, certainty, and quasi-apriority.

Also included in Chapter 10 are an interesting evaluation of the relationship between invariance and logicity, an extensive critique of the proposal that logic *is* standard first-order logic, and an informative discussion of what Sher takes to be the relationship between logic and mathematics. Historically, two perspectives have dominated thought about the latter relationship: logicism, which takes mathematics to be reducible to logic, and mathematism, found in some versions of intuitionism, which takes logic to be reducible to mathematics. Sher, by contrast, promotes the idea that logic and mathematics share a ground/foundation, *i.e.*, that neither is more basic or fundamental than the other. As Sher (p. 321) explains ‘both logic and mathematics are grounded in the *formal* aspect of reality, but they approach this aspect in different ways: mathematics *studies* the formal; logic *devises* a method of reasoning based on it’. Further, there is an important third element to Sher’s account of the relationship between logic and mathematics: it is not merely that they share a common ground but divide labor concerning this ground; they also co-operate with each other in highly fruitful ways. As Sher puts it (p. 323), there is a ‘constructive circularity’ between these two disciplines.

## 2. A CHALLENGE

As we have seen, all truth and knowledge for Sher is a matter of a systematic connection between the mind and an independent reality. Moreover, her choices clearly indicate that, while her approach to truth and knowledge is meant to cover all branches of knowledge, as she sees things, the challenging cases for it to handle are logic, philosophy, and mathematics. I am not convinced. It seems to me that even more challenging cases arise in the social sciences, for we certainly would not want to deny that the social sciences delineate various truths; yet, in many cases, these truths do not concern an independent reality, *i.e.*, a reality that exists (largely) independently of human minds. Consider, for instance, the claims ‘When full, the United States Supreme Court has nine members’, ‘The border between the United States and Canada runs through Lake Erie’, and ‘The First Amendment to the United States Constitution protects free speech’. Each, I take it, is true; indeed, in an important sense, each is objectively true for each possesses its truth value independently of the choices, preferences, feelings, *etc.* of any particular individual who assesses that value. Yet equally clear is that there would not be a United States Supreme Court, a border between the United States and Canada, or a First Amendment to the United States Constitution if there were not human minds. Accordingly, none of these objective truths concerns an independent reality. Thus, it would seem, none of these truths is true in virtue of there being a systematic connection between its content and such a reality.

The problem for Sher’s account is that much of the, at least *prima facie*, subject matter of certain of the social sciences simply would not exist if there

were not human minds. All of the following, for instance, are within the *prima facie* subject matter of certain social sciences and, at the same time, would fail to exist if there were not human minds: the economy, systems of government and their instances, laws/legal systems and their instances, education systems and their instances, and various corporate entities.

How might Sher respond to this observation? One — I think disastrous — response would be to insist that, since truth is a matter of a connection between thought and an independent reality and the economy, systems of government, legal systems, education systems, corporations, *etc.* are not facets of an independent reality, there are not any truths concerning these items. Essentially, this response would, very implausibly, deny that the relevant social sciences are sciences.

A second — somewhat better — response would be for Sher to try to treat items such as the economy, systems of government, legal systems, education systems, corporations, *etc.* in the same kind of way that she treats mathematical individuals. Specifically, Sher could claim that, just as mathematical individuals are not the real subject matter of mathematical theories, the economy, systems of government, legal systems, education systems, corporations, *etc.* are not the real subject matter of the relevant social sciences. Like mathematical theories, which indirectly correspond to higher-order properties of (an independent) reality, the relevant social scientific theories correspond indirectly to certain, as yet unspecified, facets of (an independent) reality. The problem with this response, it seems to me, is that pragmatic, teleological considerations play such a large role in the construction of the *prima facie* subject matters of the relevant social scientific theories that there simply is not likely to be a systematic, indirect correspondence between these theories and any facets of (an independent) reality. There certainly is not the same kind of simple relationship between these theories and facets of (an independent) reality that there is between arithmetic and (independent) cardinality properties.

A third — I think best — response would be to articulate a different understanding of independent reality, according to which independence and substantiveness are not understood metaphysically, *i.e.*, in largely modal-existential terms, but epistemically (*e.g.*, in terms of the truth values of the contents of a particular theory being fixed independently of the choices, preferences, feelings, *etc.* of individuals who assess these values or in terms of these values being discoverable rather than stipulated). It is a well-known feature of social reality that, even though it would not exist if there were not human minds, the truth values of many contents that concern it are fixed independently of the choices, preferences, feelings, *etc.* of all particular individuals who assess them and so need to be discovered — see, for instance, [Searle, 2010]. Accordingly, this option is open to Sher. Indeed, given that, in Chapter 5, Section 4, she characterizes the independence condition on her realism in epistemic rather than metaphysical terms, one might be tempted to suggest that this understanding of independence is what Sher has in mind. I do not believe

that this is correct, though. Here are a couple of quotes that suggest otherwise (p. 97):

[Sher's] realist would ... say that the standard of adequacy of human theories must appeal to aspects of reality that are *largely* or *significantly* independent of our mode of cognizing them.

The true question of realism is not whether knowledge is dependent *only* on the world (and *not at all* on the mind) but whether its dependence on the world is *sufficiently significant* (strong, deep, thorough, systematic, substantial) to justify its being *genuine* knowledge. And to say that reality, as an arbiter of our theories, needs to be significantly (but not completely) independent of the mind is to say just that.

Further, there is a second reason to believe that Sher does not endorse response three to my observation: such an endorsement would bring into question many of her claims about mathematics. Suppose that Sher were to acknowledge that the kind of correspondence required for genuine truth and knowledge need not be correspondence with facets of reality that exist largely independently of human minds. In other words, suppose that Sher were to acknowledge that the said correspondence could be with facets of reality for whose existence humans are responsible provided that contents concerning those facets of reality are objective in the sense that their truth values are fixed independently of the choices, preferences, feelings, *etc.* of any particular individual who assesses them and, so, are open to discovery. Under these circumstances, there would be no need for Sher to characterize mathematical truth as being determined by an indirect correspondence with reality; she could simply claim that mathematical truth is a matter of direct correspondence with mathematical individuals that we construct for our representational purposes. The key observation here is that if items such as the United States Supreme Court and the border between the United States and Canada can be legitimately conceived of as individuals that we have constructed to serve our pragmatic purposes, where truth concerning these individuals is a matter of a direct correspondence between them and thought concerning them, then there is no reason why mathematical individuals cannot be legitimately conceived of in the same way. That is, there is no reason why we cannot legitimately conceive of mathematical individuals as facets of reality that we have constructed to serve our pragmatic purposes, where truth concerning these individuals is a matter of a direct correspondence between them and thought concerning them. Indeed, Sher herself has articulated the pragmatic function that such individuals would, according to this account, serve: they would facilitate our ability to engage in various representational activities concerning higher-order properties by allowing us to treat the subject matter of these activities as individuals.<sup>3</sup> Accordingly, if Sher endorses

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<sup>3</sup> See [Cole, 2013, 2015, 2017] for the details of an account of mathematics along these lines.

response three, posits introduced to simulate aspects of (an independent) reality should not be conceived of as fictions but as genuine facets of reality. Moreover, truths that, *prima facie*, are true in virtue of there being a direct correspondence between their contents and constructed facets of reality are indeed true in virtue of this relationship rather than an indirect correspondence between their contents and facets of (an independent) reality.

I will not speak for Sher on the issue of which, if any, of my three responses to the aforementioned observation she might prefer. I will simply note that, despite the significant interest and beauty of her integrated theory of knowledge, truth, and logic, it does not adequately capture cases of genuine truth and knowledge in the social sciences. Moreover, altering it to account for these cases correctly is likely to require substantial, rather than minor, modification.

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