Towards a Complimentary Relationship of Metaphysics and Empiricism

A Scientific Fable of Teamwork

It wasn’t like I’d never brought it up before. I told him right at the start I was getting mad. “Do you mean to tell me that I can’t trust science? That’s crap, you moron.”

 Wally pouted, “What do you know about it. You don’t even know how a toaster works.”

 “Do so. Electricity toasts bread.” I pushed my fist in front of my mouth in thought. “Those red things inside, that’s electricity.”

 “Okay, I’ll give you that one.”
 “Would you imbeciles shut up. I trying to read,” Sally put her finger in the book to mark her page. “I’ve got a history test tomorrow.”

 “So read then. Nobody’s in front of the book,” I offered. Immediately sorry that I started off on the wrong foot, I decided to enlist her help. You ever thought about science, Sal? I mean can you trust it?”

 She put her pencil in the spot her finger was and put the book of the counter next to the sofa. “I need a break anyway.” She looked briefly to the floor, pushed her blue hair out of her eyes. “I’ll answer if you get me a beer.” She waited until Wally stood up. “And put it in a glass; I ain’t no heathen.”

 “You can trust science, can’t you?”

 Sally shrugged before starting,“Well, sure, if it’s done well. It gives you answers that can be proven to be good,” she smoothly transitioned from book speak to brother speak. It was a skill she developed unconsciously over the years. “But, it can go bad.”

 “How so?” Wally plopped down at the far end of the couch.

 She took a big gulp of brew before she continued,“There’s this story my prof told about the history of geology. Geologists pretty much all believed at one time that rocks were all made less than seven thousand years ago. This is a long time ago, but not so much for a rock.”

 I jumped in, “Heck, they’re older than dirt.” They both gave me the stink-eye so I shut up.

 “Well anyway, everybody pretty much believed in the creation story in the bible. And then the people that didn’t were not itching to make enemies, so, you know?” she paused for effect. “The problem was that there were all sorts of rocks that were hard to account for. They added to their explanation Noah’s flood from the bible to account for the layers of rock they discovered.” The beer was satisfying, so she used it to fuel what she could recall. “I don’t know, but perhaps you could make sandstone or shale and stuff like that, but it would take a lot of time and pressure. But they figured it was a deep flood, and all that water was so heavy.” She took a drink and gathered her thoughts. “Pretty soon, the rocks then that they should have been trying to account for magically became the evidence that they needed to prove they were right. You might think they’d stop and ask where’d the water go? But they just claimed it soaked in or evaporated or some other stuff. When you want to believe something, it doesn’t take much persuasion to find out you’re right. Ignorance is bliss. Anyway. science was happy.”

 When Sally paused to take another swallow, Wally spoke up, “Seems kind of heavy on the magic.”

 “Science doesn’t deal well with boat rockers. Then along comes this professor Hutton. He looks at the cliff near the sea shore and being a geologist he claimed to know how the rocks were really made. He even claimed he could account for granite and other sorts of stones that the other side had been trying to disregard. He said they were made in volcanoes and the molten rock slowly cooled to make these sorts of examples. Then he really made nuisance of himself by claiming to have crunched the numbers and discovered the earth had to be way older than believed.

 “The other side was really mad. First they pointed out that the earth was sure as shooten’ less than seven thousand years old. Everybody knew that! Then they began to pile on, like in football. They next made their case that volcanoes came about because of underground coal fires. Everybody knew that! They realized that many volcanoes occurred where there was not much coal, yet there’s the heat. The evidence is staring you in the face!” She downed another gulp of her brew leaving a slow wave of suds to make its way down the glass. She was caught up in the story by this point. “They next decided to change the standards of proof. Maybe we can somehow challenge his mathematics. Or demand he can make his own granite. Of course, there were a few scholars here and there who were not team players who mumbled that our side can’t make it at all. But, they were quickly pulled back into line. Somebody pointed out that Hutton had already tried to make granite, but they happily noted that the stuff he made wasn’t very good. They all joined in by proclaiming, we could have expected as much. That sucker is trying to undermine the foundations of science.”

 Feeling my side was floundering I chimed in, “But this Houston dude was right though, and science is trustworthy.”

 “Hutton was dead twenty years, and people were still finding scientific papers making a case for the flood theory.”

 “It works eventually though.” I stated with a fake pride, trying to rescue something from from the ashes.

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 “Whether we like the findings of these replications or not misses the point. As long as psi studies meet the standards of sound, empirical replications, we’re ethically obligated.”

 “You’re actually missing the bigger picture here, Lawrence. Our credibility is a bigger issue. Everybody knows full well that they’re dead wrong. All credible science is on our side. Extraordinary claims, require extraordinary evidence!”

 “What is this a platitude festival?” I turned towards Wallace as the final appeal. Jorge and I knew at the outset, he hated these institutional quarrels, but that’s why he made the big money.

 We took our seats and Jorge set a fresh cappuccino on the boss’s desk within his easy reach.

 He pursed his lips at the sight of the crinkled paper cup, but accepted it without comment.

 He breathed in the aroma of cappuccino and crinkled cardboard and began. “I’ve read over the correspondence, and I’ll state at the outset that is not a clear cut as either of you believe.” He paused for effect and took a small sip. Averting his eyes to the desk, he ever so subtly shook his head before he looked in turn from my face to Jorge. “The consensus in the scientific community is that psi research does, in fact, threaten to undermine scientific credibility.” He paused for effect. “My gosh, scholarly journals systematically avoid publishing their research. Even professors are taught to toe the line and avoid the topic...that is if they want tenure.” He caught me starting to shake my head. “Except for Stanford.”

 I broke in regardless, “One of China’s best researchers in psi was made Provost of one of their best universities.”

 “I did not know that.” You could nearly see the gears turning in his head, “Nonetheless, we’re not in China. He looks away, “Jorge, you’re clearly changing the standards of replication on anything that smacks of psi.”

 “Everybody here knows that! It is for the benefit of good science, though.”

 “Yet, as you say, it is not only common, in the West,” he nods to me to keep things cordial, “but it is universal practice?” He gestures with his index finger as he ponders the issue.

 “Absolutely. We can even sell it as being can super rigorous, actually.”

 He tighten his jaw and nods assent. With that settled, he looks back to me. “I heard you got another science of mind study that claims that consciousness is an illusion?” He smoothly changed the topic.

 “As you might imagine, they’re stumped as to what might count as straightforward replication.”

 He took a sip of cappuccino and leaned back in the good chair. “Who’s asking the question?”

 “Beats me?”

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Metaphysics as an ontological foundation for the scientific enterprise has had a had a long history. The purpose of the above sketches are not to denigrate religious motivation. Faith, when not wedded to fanatical intolerance, has much to recommend it. As the Dali Lama stated in a speech to Professor, David Cope, a scholar and friend of mine many decades ago, “All religions try to raise and develop good people. They also help individuals cope with difficult situations. There is a need to develop harmony between these traditions” (Dali Lama 1994). Nor do I intend to especially pick on science for uncritically embracing materialist assumptions (Smith 2003). My case is that the scientific enterprise often rides on metaphysical foundations that deserve critical analysis, and I plan to lay out the sort of structural framework that is likely to support the empirical enterprise, rather than ones that hinder scientific progress.

 Some fine and noteworthy scientists do ignore the philosophy of science due to pragmatic concerns that they anticipate might rightly divide their energies and focus. They perhaps labor away on practical projects likely to improve our quality of life. Furthermore, due to their particular project avoiding scientific metaphysics may be justified and efficacious.

 Many other scientists unwittingly embrace rather naive assumptions about contentious philosophical issues. They may have heard of three branches of commonly held philosophies of science (The Aristotelian, the Neo-Platonic, and the Mechanistic) and pick one, or one of their many subdivisions and iterations, without much critical introspection and they proceed with their scientific endeavors (Hueck 2024). Occasionally their metaphysical choice leads them and others astray. I’ve found in even prestigious scientific publications that scientists have taken this approach. In one I will not single out, a scientist claimed that idealism could not provide an answer he clearly needed because “it mistook our way of knowing the world with the world itself,” figuring that this statement alone settled the issue. It was not an especially compelling case.

 Other more philosophically inclined scientists are so disturbed by what is believed to be an apparent undecidability between the philosophy of science positions, that they declare metaphysical foundations that underpin the empirical enterprise are a waste of intellect (Hueck 2024). Obviously many researchers fall somewhere between these viewpoints.

 Finally, there are other scientific like writers Sagan and Hawking, whose popular books I reviewed*,* who both claimed that science should replace philosophy, only to awkwardly engage in philosophy themselves. In fact, Hawking contended that science had already replaced philosophy since philosophy only deals with pseudo questions. He then presented a resurrection of a materialist version of logical positivism with no apparent appreciation of its self-defeating aspects. Their excursions into philosophy were unhelpful endeavors.

 I grant at the outset that science, when it is done effectively, produces answers that are demonstrably true about how the world works. It is a self-correcting methodology that when exercised without bias makes numerous positive contributions to knowledge. Since the scientific enterprise rests upon ontological foundations the combination of scientific inquiry and metaphysical grounding ought to be a complimentary pairing. Yet, scientific methodology has led to advancements that at first glance seem to dwarf those of metaphysicians. This may in part arise from optics. While a major scientific advancement can often create clear changes in the lives of a population, a needed clarification in the metaphysical domain and its affects and its influences are less immediately appreciated. The cutting edge of either discipline honestly lies outside of the appreciation of all but a small part of any population regardless. The honest weight of the evidence alone within either discipline should be the prevailing feature when modification is necessitated.

 First laws of formal, analytic logic can be trusted. Yet, we need to recognize caveats. Philosophy and the sciences have historically built upon analogies which they use to make sense of the world. Many of these are so ingrained in our thinking that to question them seems to strain credibility. Consider the belief that atoms are infinitesimally minute little solar systems that spin around and bang into each other. It makes for a clean image; it’s easy to visualize, and it helps make sense of chemistry, pressures and the like. But more recently the science of particle physics tells us such a view is untenable and does not comport with reality. The view of particle physics and the naive analogy of a little solar system are incompatible (Kasrup 2014). Logic tells us so, and logic can be trusted. One or both need to be adjusted. As I evaluate the evidence, I see no need to alter the view of particle physics to mitigate the difficulty. The analogy was confused at the outset. New evidence can perhaps reopen the issue at a later date, but provisionally this view is the winner as particle physicists can demonstrate the truth of their position.

 Admitting that mathematics can be tied to formal, analytic philosophy, it may also be connected to an analytic discipline that previously used logic alone. Recognizing several facts about the use of mathematical tools are also required. The incompleteness theorem by “Kurt Gödel implies that we can never list a set of correct mathematical principles from which solutions to all mathematical problems can in principle be derived” (Williams 2024). This applies to logic as well as mathematics. Wittgenstein’s claim that there are no surprises in logic is wrong (Williams 2024). Recognizing this fact, we may feel compelled to forego metaphysical speculations, and restrict the philosophy of science to the fields of logic alone. We need to resist this natural impulse. Mathematics is a tool of science, and a tool of philosophy. We need to appreciate that mathematics cannot stand in the place of philosophy, although some within the scientific community uncritically suggest the attempt. Terms like *beauty* or *justice* and other human centered conceptions have a clear place in human values. They have no any clear translation into mathematical terms. Much of value will resist any efforts towards this reduction and replacement to mathematics alone.

 Rather than the focus upon mathematics and logic alone, I would suggest that philosophy ought to use model-building methods much more widely and systematically. It won’t solve all philosophical problems, but it will enable progress to be made. We can discover mathematically how things work in a given model. Of course, someone can always challenge the model, accuse it of being misleading. But the model-building spirit is that you can’t rule out a model just by being negative. It was never meant to correspond exactly to real life. Instead, if you don’t like a model, the challenge is on you to build a better model, one which explains what the previous one explained and more besides. Instead of just locking horns, the critic is forced to do something constructive. This is not to say that heuristical applications are necessarily unhelpful. For example, using a computer model to visualize how innovative chemical compounds may be fashioned or creating a digital model to teach a robot not to crash into things are often helpful as long as they are not asked to carry more epistemological weight than originally intended.

 Explanatory analogies can also arise from the grammar and semiotic scaffolding of languages. Care should be taken to ensure that simplistic analogies do not arise from our failures to critically examine language and how it shapes thought. The careful examination of languages can mitigate the conflations of formal analytic logical analysis from varieties of categorical confusions and the like to which languages can sometimes lead us. One may be tempted to accept a premise as commonsense without more serious parsing, and this is especially true if language inadvertently clouds an issue. Even a statement like, “I think, therefore I am.” seems in part indubitable due to grammatical necessities. For instance, if one instead suggested that there is thinking occurring, which was Hume’s suggestion, this might be a fairer starting point. Or when Kant pointed out that previous versions of the ontological argument treated *existence* as a characteristic, when it was in fact a *precondition to having characteristics,* this was a helpful distinction. These examples are intended only illuminate and detail the power of language to clarify or obfuscate an issue, not to weigh in on the above debates.

 One must also recognize that humans are held captive to mistaken analogies that arise due to problems of scale that confront us at the extremes both at the very large and small levels of reality. We are often prisoners of our perceptions of size and magnitude. You may use mathematics to get some sense of say how many atoms exist in a random drop of water, but the typical mind can not appreciate this number. At the large-scale we may inquire as to how many light-years our galaxy is across, and how many galaxies there are the universe. I can offer the numbers, but if you’re like me, I make the self-evident claim that these are beyond my imagination, shake my head and do something else. I state this fact to suggest that being prisoners of our perceptions of scale can lead us into unhelpful ill considered analogies. For example an object, like a chess piece is made of building blocks (littler hunks of plastic or wood, and the like). This in turn is made of smaller objects and so on until you get to the objects at the bottom. Science claims that at the bottom, if there is one, what we have are not objects at all or if they’re objects they don’t behave like objects are supposed to. They are closer to quantum entangled *somethings*.Our perceptions of scale get in the way of clear thinking, and they also pave the way to what appears to be philosophical overreach, such as the emergence of fictitious objects at the quantum level without their having ontological necessity. Metaphysical speculations, while necessary to the philosophical enterprise, must give way to the demonstrable facts given by sound empirical practices. The scientific disciplines also needs guidance from the best in philosophy to both guide its research and to render it human-centered. I recall a special issue of *Scientific American* many years ago that carefully analyzed the construction of the world’s best violins, carefully detailing every aspect that they could research. The scientific article, while independently fascinating, had nothing to say about the beautiful tonal qualities of a good violin in the hands of a master musician. Without this interconnection I wonder why anyone would care about the science of violin construction at all (<https://www.scinetificamercan.com/article/the-physics-of-violins/> 1962).

 In addition to the power of metaphysics to guide and underpin scientific inquiry it can at its best make connections between scientific disciplines that might otherwise go unnoticed. This leads us to another aspect in the marriage of sound metaphysical speculation and science. Effective metaphysics can efficaciously trace previously unattended connections that arise between various disciplines of human thought. An often used example involved masters of geometry. Euclidean geometry is formulated so that if one takes away any of its postulates and axioms you can cleverly work with the ones that are left to resupply the one that was missing, all except for the parallel lines postulate. The parallel lines postulate was therefore viewed as necessary to how the world works, but not logically necessary to the science of geometry. This I can relate clearly, but what follows may be less clear to the geometrically challenged. Bernard Riemann wrote a rather broad paper suggesting a differential geometry with smooth manifolds including a Riemannian metric (which bears his name). This metric produces an inner product upon tangent space maintaining local notions of surface areas, angles, lengths of curves and volumes through the use of geodesics. From those, some other global quantities can be derived by including local contributions. What is especially helpful about this is that it can be applied to differential manifolds of higher dimensions. It was a logically consistent geometry where parallel lines could indeed meet. It was logically consistent, but geometry scholars figured it did not comport with reality. Still, they figured, “a good show” (Sklar 2008).

 Another group of geometry scholars combined forces to work out the details of an other non-Euclidean effort. There creation is called Lobachevskian geometry, which is the geometry of pseudospherical surfaces, creating through their efforts a constant negative Gaussian curve. This can be visualized as a saddle surface where at least in some regions they create what appears locally as a hyperbolic plane. Once again they have a non-Euclidean geometry where parallel lines could meet. It was logically consistent, but it does not seem to fit with reality (Sklar 2008).

 Here the story may have ended, but for Einstein. There was first the cleverly devised experimental efforts of Michelson and Morley and their attempt to measure the motion of the Earth relative to the aether. They found no evidence for luminiferous aether using the Earth’s motion as a standard. They not only found no evidence for aether, their discovery cast doubt on the whole idea as aether as a medium that carried light waves. Whether Einstein was influenced by their work is presently unknown. But through their help or by thought alone he came to the conclusion that Newton’s theories needed revision (Sklar 2008).

 A first set of revisions were suggested in Einstein’s 1905 paper “On the Electrodynamics of Moving Bodies.” The theory he presented can be seen logically growing out of the confluence of only two postulates:

1. The laws of physics are invariant in all inertial frames of reference.

2. The speed of light in a vacuum is the same for all observers (light speed invariance) (https://www.deanza.edu/faculty/lunaeduardo/Postulates%20of%20Special%20Relativity1.pdf)

 His theory overturned the Newtonian position. The mathematics for working through his special theory of relativity had already been accomplished by the geometries realized in the Lobachevskian model. This hyperboliod model of geometry provides a mapping of events one temporal unit into the future in Minkowski space that flawlessly provides the scaffolding necessary to support special relativity and its pragmatic form in the modern era. These sorts of unexpected connections between disciplines are precisely the sorts that push scientific discovery forward. These are the sort of relationships that may be efficaciously mined by sound efforts within a philosophy of science that is not bounded by naive intuitions and unexamined metaphysical assumptions (Sklar 2008).

 In 1915 Einstein published his theory of general relativity. His efforts in this work still stand as the accepted current description of gravitation in modern physics by refining Newton’s law of universal gravitation. He created a unified description of gravity as a geometric property of space and time into a curving spacetime of four-dimensions which is directly related to both energy and momentum of all present matter and radiation. These relationships are specified by his field equation and partial differential equations. Like his earlier work, it has now become the standard model in large-scale physics. The behavior of geodesics when employed to the study of differentiabie manifolds of higher dimensions is made possible by the earlier work of Riemann, whose efforts in logic and geometry challenged the common metaphysical foundations of its day. Naive and largely unexamined metaphysics pushed his efforts out of the mainstream. Yet while other disciplines drew greater attention Riemann’s efforts provided the framework for Einstein’s theory of general relativity and even proved to generate valuable insights into algebraic and differential topology (Sklar 2008). An effective philosophy of science may work to discover and examine these connections between disciplines of scientific discourse in a manner that is complimentary to all disciplines involved.

 Philosophical frameworks of many sorts might can suggest efficacious research possibilities. This is a very real benefit to both philosophical discourse and the science that it motivates. For instance, a Kantian might hold that even physical objects are not readily given, but they instead arise through a combination of sensory input and concepts. The Kantian mode of participatory realization wherein the life of the organism and its entelechy can become the object of scientific research can open itself to a wealth of pragmatic concerns. At the very least it can be argued that its participatory aspects facilitates a richer conception of nature as well as an appreciation of livings beings within its domain. A Kantian approach may provide structural taxonomies that can be fruitfully assessed through empirical approaches. A modernized version of transcendental philosophy must probably need to set aside the notions of being completely free of the empirical methodology and with it the purity of the a priori. Yet the a priori validity of knowledge does not exclude the chances of its empirical discovery. It is suggested that Kant’s reflections on non-pure synthetic knowledge actually suggests the sorts of approaches that may be researched wherein the a priori could be discovered empirically, even if not decisively proven (Hermann 2020). Whereas, I chose a Kantian perspective as a model, these sorts of philosophical starting points may be used to guide any number of empirical studies of connections and may be fruitfully explored in exposing and mapping the directions of empirical research. Since human based values are often co-existent with philosophical underpinnings the practical nature of the scientific research into these realms may often be expected at the outset.

 Object focused varieties of materialism may lend itself to any number of large-scale disciplines. It can be efficaciously used to develop new, more powerful, more efficient devices, machines, and assorted discoveries with greater dependabilities and functionalities than ever before. These are the sorts of convergences of metaphysics and empiricism that would have stunned the imaginations of previous generations. Due in part to how questions of scale do not work and play with well with our commonsense, materialism seems practically self-evident. It does run afoul in some disciplines of science though. Given the number of atoms they find in a drop of water, even if the atoms are at the quantum level are undetermined, the world of cause and effect appears to serve us effectively in our connection to nature. It’s striking dominance in our contemporary philosophy of science seems less helpful (Rydman 2024). It does not work effectively at the smallest known levels of reality, (Kastrup 2014) and it pushes contemporary materialist philosophers of mind to suggest consciousness must be somehow less than real or even some sort of persistent illusion. I do not find these outcomes especially compelling.

 Philosophies that concentrate their focus upon the inter-connectivities of knowledge and its sources will discover that their philosophical foundations lend themselves to numerous empirically testable aspects. The work that metaphysicians of this persuasion practice involves developing and coordinating ways of interpreting experience with the interpretation of our own personal experiences that each of us encounter daily. “Just as each individual is engaged in the project of seeing their own life steadily (by making sense of, or fitting together, one’s own experiences, memories, feelings, and desires), a good metaphysician should aim to see life itself steadily – which may require drawing on the expertise of other disciplines such as science and theology” (West 2024). As Emmet suggests, we ought to accept the clear fact that we are closely intermingled with the rest of reality. This will open empirical paths of experimentation that focus upon this rapport rather than trying to make sense of our condition by attempting to infer from perceptions to an external. The examination of this fact opens us to other real possibilities such as the insight that the structure of our ideas perhaps does not prove that the external exhibits an isomorphic structure (West 2024). These insights are likely valuable. I see no particular reason that aspects of this connectivity must lay outside of the purview of the empirical.

 My own previous metaphysical speculation falls very close to the idealist metaphysics of Bernardo Kastrup, in that his perspective best unifies the present scientific discoveries throughout empirical discourses and disciplines. It does not necessarily follow that Kastrup’s position amounts to a last word on the topic, although it fits best with our present empirical foundations.

 Perhaps even existential philosophies may find a helpful partner in the empirical realm. While seemingly distinct, empiricism and existentialism share a connection in their emphasis on the importance of individual experience. This is primarily derived from subjective lived experience which can be researched and empirically situated and studied. I will leave this proposed interconnection to others more qualified.

 Whereas I have suggested as much previously I now will address more directly the role of metaphor in the connection to science and philosophy. I believe that unhelpful metaphors are often used to carry a considerable weight in pushing the directions of science and philosophy. In fact, I find that some contemporary scientists suggest that their employment in the philosophy of science does direct damage to the general empirical enterprise. While I admit that there is something right about this complaint it could be more fruitfully addressed in this manner. Let’s agree, that often in defense of an epistemic privilege of science some metaphorical expressions, like other figures of speech, are diverted merely to fulfill heuristic functions. Scientists often suggest that when they use metaphor it is not intended to express a precise definition that is inaccessible to anyone but specialists. Nearly always in practice this contention does not hold. In spite of what they often claim, scientists are not using metaphors as substitutes or paraphrases of more precise literal expressions they employ with colleagues, but are the way of expressing their commonly expressed ideas. Lexicality as it is used by specialists and the metaphors they employ are part of their technical vocabulary. Metaphors are part of language, and to pretend otherwise or point to others, claiming that they’re to blame is unhelpful. The consequences of metaphors are part of the theoretical system wherein they arose in the same way axioms and postulates of geometry are a part of the theoretical system in which they operate (Palma 2018). Furthermore, when scientists attempt to blame non-scientists as the source of a problem, I suggest we’re in this together. Yet they are, nonetheless, right in demanding a careful examination of explanatory metaphors. They occasionally carry more weight than they deserve. To claim that philosophy of science is muddying the waters with metaphor is more emotionally effective than pragmatically so.

 My position is that metaphysical speculation and ontology have always been connected to the scientific enterprise. They drive each other forward. I also speculate that any attempts to make it metaphysical speculations superfluous to empiricism robs science of an overarching framework within science can work its craft. While I’ve struggled to advance a marriage of science and philosophy that is complimentary, I’ve also avoided a number of questions, such as the limits of ontological speculation that philosophy is entitled to hold and how this may place limits upon its usefulness. While I have suggested that the philosophy of science can be driven by subtle errors that can be defended against, what can it do to prevent mistakes merely from overreaching ambition? The metaphysical foundations of science should not be contradicted by clearly discovered, replicatable empirical facts within specific the domains to which it is employed. This should limit the tendency to hubris that is all too human.

 Science today presents to us facts that not only counter-intuitive, but challenging to common metaphysical speculation. Intuition specifies only certain events are possible. Therefore when particle physics demonstrates the error of the following notions: that causes antedate their effects, that identity over time supervenes upon facts about how time works, that dispositions reduce to categorical bases, and the like, metaphysicians may feel a bit lost at sea without a clear sense of direction. Given these facts, metaphysical philosophers rightly question whether helpful metaphysical speculation is actually possible. In one sense it certainly is, people are doing it; I do it myself. I also contend that philosophers of science can also forge headlong into these difficulties by reconsidering what is logically possible. This needs to be a careful and painstaking enterprise. I believe that science, rather than philosophy, must distinguish which of the possible fundamental structures of reality obtain, and this reality needs to be true and non-contradictory. If different specialized sciences provide actual contradictory findings, logic specifies that some of them are mistaken. No discipline of science should be allowed to claim that their respective partial view of the whole has a special access to truth. This task alone belongs to the science of being and ontology. Whether these metaphysical approaches focus upon transcendental idealism, objects and varieties of causal relationships, thoughts and varieties of idealism, connections between ideas and any combination of the above, or any of the many supposed foundations is not as important to my methodology as the fact that it should always reflect the well supported facts that science have discovered. Particle physics may cast doubt on the reduction of the world to atomic objects. It does not follow from this fact that talk of objects is somehow simple-minded. You may not have overpaid for your television set at all. Paying attention to factors of scale may be helpful here. I contend that no single discipline within science trumps the others. The duty of the philosophy of science is, in part, to wade through the scientific discourses and to discover unifying principles that can help make better sense of how these facts can be unified into a coherent whole. This overarching philosophical framework should always labor to be precise, as accurate as is possible, and detailed enough that it can push forward helpful scientific discourse. When metaphysical foundations are clearly in conflict with well supported scientific evidence, such as occurs between psi researchers and current the mechanistic scientists or between the Neptune theorists in geology and the old Earth proponents trustworthy scientists ought not to bury inconvenient findings. It surreptitiously subverts the marriage of science and philosophy. It is a bit like banning books (speaking as library trustee of questionable value) hiding from unpopular ideas does not lead to good ends.

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