

Against border patrols

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Introduction: The ascendancy of science

Science, physics especially, has enjoyed a long history; it has been around since the time of the ancients. This is not to say that it has always been esteemed by ordinary people, whether in its products (theories), its personnel (individual scientists) or simply as a cultural institution. The high status science enjoys in our own era is a recent development, no more than about a century old. Jimena Canales (2015) documents the meteoric rise of physics into high repute in the early 20th century. She argues that this ascent came on the heels of a certain confrontation with philosophy, which at the time enjoyed much greater respect. At the epicenter of the encounter was a debate that took place in Paris in April 1922, on the subject of the nature of Einstein's conception of time in the theory of relativity. This was an encounter between the then-celebrated French philosopher Henri Bergson and the then-not-all-that-famous Albert Einstein. Physics, according to Canales, enjoys its current ascendant status and muscular image at the expense of philosophy—one might even say the “feminization” of philosophy in the eyes of a larger world as an enterprise concerned more with subjectivities of experience (for instance the experience of time) than with objective and immutable realities.¹ Canales describes the “backstory of the rise of science” as one achieved at the price of antagonistic relations with other disciplines, philosophy most especially; and she traces the contemporary lack of communication between scientists and humanists back to the interactions surrounding this episode in the early 20th century. “The scientist's views on time came to dominate most learned discussions on the topic, keeping in abeyance not only Bergson's but many ... artistic and literary approaches, relegating them to a position of secondary, auxiliary importance. For many, Bergson's defeat represented a victory of ‘rationality’ against ‘intuition.’ It marked a moment when intellectuals were no longer able to keep up with revolutions in science due to its increasing complexity. For that reason, they should stay out of it.” (2015, 6)

To put it bluntly, Canales's (2015, especially chapter 2) documentary evidence points to the fact that Einstein, in the follow-up to this episode, intentionally and unfairly depicted Bergson, who enjoyed a very wide readership, especially among women, as failing to understand the fundamental concepts of his theory of relativity. Einstein depicted the philosopher as concerned only with scrutinizing, defending and employing folk concepts. He depicted philosophy, not so much as mistaken and therefore to be set right by the newest discoveries, but rather as simply and irredeemably disengaged from the realities of the physical world. “The time of the philosophers does not exist,” Einstein said, not that the philosophers have made mistakes in their conceptualizations of and/or attributions to it. He positioned philosophy as ultimately incapable of the intellectual innovations required to grasp objective realities. Thus the self-conception of mid-and late 20th-century, so-called “analytic” philosophy—which persists in

¹ Canales (2015, 479) argues that Bergson himself experienced a feminization, due at least in part to his popularity among women readers and in part to the fact that Einstein never acknowledged any merits in his views.

many philosophy departments to this day—as a discipline concerned exclusively with concepts and their application by the common folk—is no accident: it seems that we have Einstein to thank, at least in part, for that self-conception.

As well as suspicion among scientists in regards to philosophy, Canales also traces the roots of logical positivism—a movement internal to philosophy considered by some in the home discipline as itself amounting to a form of scientism—to the aftermaths of the encounter in Paris between the scientist and the philosopher. Einstein was not alone in attempting to lop off some branches of philosophy from the rest of the tree of knowledge (though he was perhaps more thorough than the preeminent luminaries of logical positivism). There has been for some decades now some discussion of the extent to which philosophy has overcome the influences of logical positivism in its own ranks. Philosophy's recovery at this date can be measured in the numbers—not inconsiderable—of philosophers nowadays who take themselves, under the banner of “naturalism” (cf. Spurrett 2008), to be participating in an ecumenical effort to make sense of the world as a whole, including but not confined to the human experience in it, rather than as “servicing” other disciplines through analysis of concepts construed as more-or-less arbitrary human constructions.

Since the Bergson-Einstein clash, philosophers have appeared to physicists to be easy, open targets. Several prominent physicists today are re-enacting this self-same stratagem from Einstein's playbook.² Like Einstein, they depict science as concerned with objective topics, whereas philosophy (according to their folk tales) has its gaze turned inward, as it devolves into frivolous and foolish questions. With this false view of philosophy in their sights, they propose that philosophy should be displaced by science. And some of them (prominently represented by Stephen Hawking) actually believe they're beating a dead horse, or anyway a moribund one. Some philosophers, to be sure, are prepared to bury philosophy as an aprioristic discipline, joining the ranks of those who pursue philosophical questions with empirical methodologies. May they prosper. But other philosophers, in their turn, heap condemnation upon the “scientism” that prompts intrusions into philosophy by scientists poorly placed to pass judgment— intrusions, according to them, where science does not belong (cf. Haack 2009).

It is my own conviction that science and philosophy are entirely too closely intertwined ever to be divorced, albeit not so closely tied as to be completely indistinguishable. Still, it would prove impoverishing, if not entirely fatal to both, should we attempt separating them forcibly. This does not mean they do not have distinctive and identifying features. The possession of distinctive and identifying features, whatever that might come to, does not mean that a philosopher can always be assured of being able to investigate philosophical subjects without wading into waters that physicists have navigated; and similarly in reverse: no physicists can be assured that the territories they investigate are proprietary to their discipline. What the intertwining does mean is that if we try to lop off those parts of philosophy that are heavily intertwined with the sciences, they would have to be re-invented (and badly at that) elsewhere. Where, after all, would we find a home for that discipline that critically examines (rather than superficially codifies) practices and methodologies—principles that belong squarely in the

² The most egregious is perhaps Lawrence Krauss who, in reaction to David Albert's negative view of his book *A Universe from Nothing*, called David Albert—who incidentally holds a PhD in theoretical physics—a “moronic philosopher” in a self-servingly opinionated interview in the *Atlantic* (April 23, 2012). Wearing his ignorance of philosophy as a badge of honor, he there (falsely) proclaims that philosophy as a discipline is without merit, taking credit for work done by practitioners of other disciplines.

space of epistemology? Physicists who declare that physics has the appropriate tools to study certain topics formerly thought the preserve of philosophy (for example, scientific methodology) end up making epistemological claims—they end up doing philosophy, and doing it badly.

Scientism, whatever its central features (and the subject, as this volume demonstrates, is controversial), involves poor relations between the sciences and other disciplines. If only for this it must be combatted. But what is it to combat scientism? Many of those who wield the “scientism” bludgeon against others insist on better self-policing (on each side) of the boundaries between disciplines. “Separate but equal” might be their slogan. Unfortunately, these users of the label “scientism,” such as for instance (and very prominently) Susan Haack (2009)—are not in the business of illuminating for their audiences where precisely those boundaries lie. The very idea of boundaries is something that their philosophies might not even admit of, and quite typically they regard concern over the location of boundaries with suspicion—as a sign of unhealthy preoccupation with science (Haack 2009 again). So how can it make sense to insist that certain lines not be crossed when their location, and even the very existence of lines, is in question?

Now I am myself a believer in boundaries. But I am also a believer that one should travel. Still, I commend mindfulness when crossing boundaries. (I will by the end of the paper have revealed my commitments regarding boundaries between disciplines.) But while I think it’s healthy to be aware of the existence of boundaries, I do not favor policies of securing the boundaries. I think some boundary transgressions are healthy and advance knowledge—*cross-fertilization* is a better word for these crossings than *transgression*. To be sure, there are bids at hostile takeover that must be forcibly repulsed. They are *reductions*, and their exercise must be carefully policed. I am against certain hostile takeovers; but my reasons are neither because they are reductions nor because they are “scientistic”, but only because they rest on demonstrably bad arguments. (Some takeovers rest on unexceptional argument, and in that case the takeover must be allowed.) However no amount of border patrolling can reveal the flaws in a bad argument for hostile takeover. Fallacies must be exposed for fallacies in the usual way—through philosophical examination of the takeover arguments. (Philosophy is exceptionally good at exposing weaknesses of this sort.) So the “foul” I shall be calling is not the foul of scientism, nor even the foul of reductionism (since some reductions are perfectly warranted). Rather, I shall call foul on hostile takeover bids that rest on fallacies. These perhaps require no special name, since “fallacy” is severe enough—indeed the most severe foul that a philosopher can call. Still a moniker can help us notice similarities among such fouls: the term “reductionism” has already been recruited for this purpose. I shall demonstrate the moves of exposing the fallacy of reductionism by looking at the curious case of sociobiology.

If we are after better relations between the sciences and the rest of the intellectual world—and indeed we should be—we should endorse clear-headed appreciation of the virtues of scientific inquiry, as well as how science (the good stuff) is further improved by the well-functioning of other disciplines with which it has ties. I hope to provide some appreciation of that here. But I reject “separate but equal”; it motivates territoriality and bids at hostile territory grabs. At the very least, it sets the stage for border skirmishes on a grand scale. And these are simply counterproductive because border crossing can be good for all disciplines concerned (Thalos 2013a).

Science as public reason

“Science is neither a philosophy nor a belief system. It is a combination of mental operations that has become increasingly the habit of educated peoples, a culture of illuminations hit upon by a fortunate turn of history that yielded the most effective way of learning about the real world ever conceived.”

-- EO Wilson (Consilience, 45)

Whatever science is, it commands respect—and rightly so. Science represents hard-won knowledge. That’s why there are so many pretenders (known to their detractors as *pseudosciences*). And that’s also why the word of high-ranking scientists carries weight even when they speak on topics outside their areas of expertise.

If we conceive of science the way that EO Wilson’s statement encourages—or, in more academic terms, as *theoretical reasoning*, a conception that is very close to that put forward by Paul Hoyningen-Huene (2013)—we should find no fault in the idea that science is to be called upon in treatment of all questions of how the world happens to be. If we adopt this conception, there can be no question of over-enthusiasm for science, no question of uncritical deference to it, no concern for policing its borders and no worries over its unwillingness to acknowledge its limitations (such concerns as feature in a highly-influential recent article by Susan Haack). For according to this conception, science simply has no boundaries. If, on the other hand, we should define science more narrowly (ghettoize it, if you will), as that which is typified in the activities or products of physicists, chemists and maybe also biologists—the so-called *natural scientists*—then obviously there should be great concern for ensuring that the goblin does not emerge uncritically from its ghettos to infiltrate where it has no business. Then, and only then, should we be concerned about “scientism.” Obviously, then, a great deal hangs on how we conceive of science.

The fact that so much depends on the choice of conception is reason enough to engage with old problems about the borders of the sciences—reason enough for those who are concerned about “scientism” to concern themselves about lines of demarcation. For there can be no serious worry about illicit crossing of boundaries, if the borders are themselves fluid or lacking stability in the academic imaginary. It is a simple philosophical mistake, for those who worry about science overstepping its boundaries, to proclaim that identifying those boundaries is of no moment.

My own vote is in favor of a conception of science roughly like that of EO Wilson’s. Hence I cannot acknowledge the possibility of over-enthusiasm for or unwarranted deference to science. All enthusiasm for science is warranted, so long as we recognize that science is inherently fallible—that it’s not mathematics—and moreover that science cannot guarantee that technology will eventually cure all our ills. Healthy enthusiasm for science can follow from a true appreciation of what science is and what it’s not: as divine as it might be, science is not another name for Almighty God.

This does not, however, mean that I agree with certain high-profile scientists when they pronounce the premature death and displacement of philosophy. They are committing simple-minded intellectual errors, to say nothing of the gross discourtesy and grand-standing on the part of a few. My aim here is not to take these confrontations case by case. Rather, my aim here is, first, to illuminate the true threats to our common knowledge enterprise, via a case study of sociobiology’s hostile bid for takeover vis-a-vis the subject of explaining human behavior. My objective is to illuminate a class of mistake which threatens the joint enterprise by shrinking the space of that which deserves illumination. A diagnosis of

“reductionism” (not mere reduction, but reduction via bad argumentation) will be in order—it is a threat that has earned a special label. My aim ultimately is to contrast this threat (already bearing its special label) with the simple-minded challenges that we are being encouraged to label “scientism” and diagnose as some sort of border transgression. The point shall be that reductionism as a threat calls forth vigilance, but borders need no special policing. Moreover, calling out a foul on reductionisms is not a form of border patrol. To make this case, one has to be clear what one means by science, and have a sense of what one means by borders even if we cannot say where exactly they fall. So let’s begin there.

I take science to be a public, not private, knowledge enterprise. This is a loose characterization of science, and so not an especially controversial one. What it is meant to do is to correct a certain hyper-individualism (present for example in the Wilson quote at the head of this section). The contention is that science is of necessity something that is open to (and indeed has been subjected to) public scrutiny; that science is a culture of generating and curating a body of ideas/concepts/theories/evidence or what-have-you that have been so scrutinized. A person’s private thoughts, however well-conceived, don’t qualify as science simply for being good thoughts. This is not a place for advancing arguments for this contention, but I will mention one reason for thinking in these more public-oriented terms: while individuals contribute many different kinds of things to science as individuals, what they cannot do is provide quality control. QC is a systemic undertaking provided to science by scientists as a group. And science is nothing at all if not something subjected to stringent quality controls.

Answering the question of what science is has indeed been construed as a sign of an unhealthy preoccupation or obsession with science—as a sign of scientism (Haack 2009 again). Even though the topic launched the whole discipline of philosophy of science in the 20th century, is still controversial, and generates renewed interest now and again. And indeed there’s no way around grappling with this question in an honest way, in a world in which the amassed bodies of work published in highly-ranked journals (never mind the effluvia outside of these venues) outruns any single person’s ability to master the material in question. We live in a world in which no single individual can certify the value of everything that relentlessly assaults us by way of claims to truth. And indeed we’ve always lived in such a world, but the magnitude of this problem has been growing exponentially for several hundred years. We feel the problem most acutely when we consider the education of the most intellectually vulnerable among us—the children. We ask ourselves: to what do we want these young minds exposed by way of authoritative ideas? And the question of how to define science then becomes quite urgent.

Scientism and boundaries

Scientism, according to the kind authors of the corresponding Wikipedia entry, has been multiply defined:

- ❖ a term used to refer to belief in the universal applicability of the scientific method and approach, and the view that empirical science constitutes the most authoritative worldview or most valuable part of human learning to the exclusion of other viewpoints (Sorell 1994)
- ❖ "the view that the characteristic inductive methods of the natural sciences are the only source of genuine factual knowledge and, in particular, that they alone can yield true knowledge about man and society" (*New Fontana Dictionary of Modern Thought*)

- ❖ the dogmatic endorsement of scientific methodology and the reduction of all knowledge to only that which is measurable (Outhwaite 2009)
- ❖ “Pejorative term for the belief that the methods of natural science, or the categories and things recognized in natural science, form the only proper elements in any philosophical or other inquiry” (Blackburn 2005)
- ❖ indicates the improper usage of science or scientific claims. This usage applies equally in contexts where science might not apply, such as when the topic is perceived to be beyond the scope of scientific inquiry, and in contexts where there is insufficient empirical evidence to justify a scientific conclusion. It includes an excessive deference to claims made by scientists or an uncritical eagerness to accept any result described as scientific. (Haack 2003, 2009)
- ❖ "science, and only science, describes the world as it is in itself, independent of perspective" (Blackburn 2005) with a concomitant "elimination of the psychological dimensions of experience" (Haack 2003)

We can take each of these as a suggestion for how to use the expression. Each suggestion characterizes a pejorative usage, a term of abuse, but without offering a usable criterion for serious diagnosis. One can put these (multiple) definitions to diagnostic purposes only if one already knows what “science” denotes. Some authors of other chapters in this volume would like to use the term more constructively, less vaguely, without the shaming, as a badge of honor.

A preponderance of usages of the term as a term of abuse—if not merely as a waggle of the finger or a clicking of the tongue—function to mark the target of criticism as having transgressed a boundary. And all too often it is taken for granted, without argument, that boundaries are clearly established. This is not helpful. And all too often it exaggerates the distance and heightens the antagonism between the parties without clarifying the underlying sources of antagonism (which are often personal grudges or jealousies)—thus generating more heat than light. But there is a common enemy worth patrolling against, as I will now explain. And it has all the surface features of a boundary dispute, without actually being such a dispute. Its name is *reductionism*.

The common enemy: reductionism

I propose in this section to examine at some length an example of a purported boundary skirmish. I will pronounce a diagnosis of “reductionism” upon it, owing to faulty reductionist reasoning (“nothing-but”ery). The prognosis is good relations between the sciences of biology, sociology and philosophy, among others, on condition that the nothing-but-ery is rejected.

Ever since E O Wilson published his seminal work *Sociobiology* (1975), research on human ethology (of quite variable scientific quality) has been conducted in departments of Ethology, Anthropology, Biology, and now Evolutionary Psychology. And throughout that time this research has been protested by both academics and lay people, and even by highly respected biologists (cf. Gould and Lewontin, 1979) as bad science as well as bad social policy. The critics have complained that sociobiologists following Wilson’s program are committed to (among other things) a form of genetic determinism and an excessively enthusiastic adaptationism (bad biology), and that they tend to be dismissive of the contributions of learning and culture (bad science generally), all of which have knock-on effects of harshening social

conditions on people who are still socially disadvantaged (bad policy) (cf. Downes 2014 and Driscoll 2013).

The fundamental premise of the sociobiological program is that human behavior is subject to explanation via an adaptationist model: behavior B prevails in a variety of human behavioral contexts today because it conferred a higher fitness than the (behavioral) alternatives to it at a time when natural selection was acting on various aspects and “internal mechanisms” of the human brain. This highly controversial model for explaining human behavior has proliferated in recent decades, flowering into such fields as “evolutionary psychology,” “human ethology,” “evolutionary anthropology”, among other labels.

The founding argument of the research program is roughly this one, advanced by Wilson in a number of publications (see especially 1978):

1. Biology explains animal behavior, utilizing principles of natural selection.
2. Human beings are biological too; they evolved by natural selection.
3. The human brain, like any other organ, is a device for survival and reproduction.

Therefore, biology explains human behavior too, utilizing principles of natural selection.

While here is not the place to mount a defense of my view on a range of sociobiological explanation, I will venture a brief summary. My view is that the sociobiological model of explaining behavior is a fine model, but one model among many eligible models, many of them framed entirely in nonbiological terms. But so long as standards of evidence for applying it are respected, it is eligible to compete alongside other eligible models. The model is ineligible, however, if the (quite high) evidential standards for proposals purporting evolutionary adaptations cannot be met. Meeting these standards is important to ruling out competing models of explanation (including other evolutionary models). At the heart of many critic complaints of sociobiological models is the concern that many sociobiologists neglect their due diligence vis-à-vis these standards of evidence. And while many critics of sociobiology would simply like to reject all sociobiological proposals, I have no such agenda. I simply insist that sociobiologists make their case, like all other biologists, one argument for one behavior at a time. And this means that the general argument above—that would with one stroke sweep away all competing models of explaining behavior—that argument is flawed. As a philosopher, I shall undertake the task of exposing the flaws, naming them, and making a motion to dismiss the argument from the legacy of knowledge to pass down to our children.

Before exposing this argument’s decisive flaw, I draw your attention to the second premise of the argument, which states that human beings are biological. It is most definitely a true statement, so the flaw in the argument is not to be located in this statement. This true statement, however, often does double duty: it is sometimes understood as saying: human beings are biological—and nothing more. This is the nothing-but-ery that qualifies the stance of this argument as reductionistic. It is the reductionism for which we shall impugn the argument, not the simple fact that it declares human beings to be biological—among other things.

Here now is my argument to expose the reductionism in this argument—the flawed attempt to dismiss competitors to sociobiology with one sweep. If one accepts the argument above as valid, one

must also accept as valid a second argument with exactly parallel logical structure but slightly different content words (differences bolded):

1. **Physics** explains the behavior of **physical bodies**, utilizing **physical principles**.
2. Human beings are **physical** bodies too; **physical principles** apply to them.
3. The human brain, like any other organ, is a **physical body**.

Therefore, **physics** explains human behavior, utilizing **physical principles**.

If one accepts the conclusion of this parallel argument, one is explicitly denying the need for biological theory—indeed for evolutionary theory—as independently valuable in the enterprise of scientific explanation. Whence biology, as such, is made irrelevant. And sociobiology swept away with it. The logic of the reductionistic argument sweeps the board of all but physics.

Thus if one accepts the original argument as valid, one is obliged to conclude that it is a self-neutralizing threat. Better to deny the validity of the original argument: if biology is not to be made an irrelevant theory, then it cannot be thought to threaten other, otherwise well-supported, theories of human behavior, *simply on the grounds that human beings are biological too*. When the argument is revealed as reductionistic, the would-be reduction can be rejected purely on that basis.

The point is *not* that all reductions have to be banned, but that reductions, when they are successful, are acceptable *not* on the strength of reductionistic arguments (like the one we have just examined) but instead on the strength of the evidence they present for the proffered model of scientific explanation of the specific bit of phenomenon under scrutiny. We must police to ensure that when a reduction (or indeed any explanation) is proclaimed, the evidence for it is in good order; it is just another day in the academy. No extraordinary measures are required. And certainly no special measures to ensure that biologists remain in their corner, and everyone else do likewise.

The end of acrimony? Let's return to an old theory of science

CP Snow, who coined the term “two cultures” to describe the divide in our contemporary era between the sciences and the humanities, bemoaned the fact of a divide, and held that it kept humanity from solving many of its problems. If Canales’s research sheds light on anything, it sheds light on the fact that the divide is entirely an accident of history. Things could have gone differently. Had there been nothing to be gained by appearing to be at odds with one another, Einstein and Bergson might well have come away with an understanding of each other as working in complementary ways rather than at odds. And even if one of them (Bergson, say) was in error, the other could have acted as a corrective. The dispute need never have gone to a place where one party was accused of chasing after unicorns in a chariot of fire. The rift was not inevitable—and certainly not required by the logic of each of the disciplines in question.

I have thus far refrained from advancing here any controversial theories of science, in favor of something quite neutral. But it will not serve us to proceed in this vein if we are to heal the rift between the sciences and the humanities—if we are to correct misconceptions of each by the other. Those

disciplines routinely accepted as natural sciences (physics, chemistry, biology, most prominently) do not share a common core, either in methodology or in any other way. What's more, there are counterexamples in their combined bodies' narratives to almost every philosophical account of a science. Except the one I shall advance. My goal in outlining this theory here (I've defended it to a much greater extent in Thalos 2013a) is nowise to advance any sort of demarcation criterion between the sciences and everything else—which is in any case a hugely ambitious task. The goal instead is to illuminate the commonalities between sciences and many nonscientific enterprises, including philosophy. The aim is to illuminate the notion of public knowledge, and so display what they have in common rather than what divides them. Why they are entwined and cannot be prized apart. Why their kinship allows them to function well when they learn judiciously from one another. And I don't claim any originality in this theory of science. Indeed it is the oldest theory of science that there is. It was framed by the great ancestor of all the natural sciences—Aristotle.

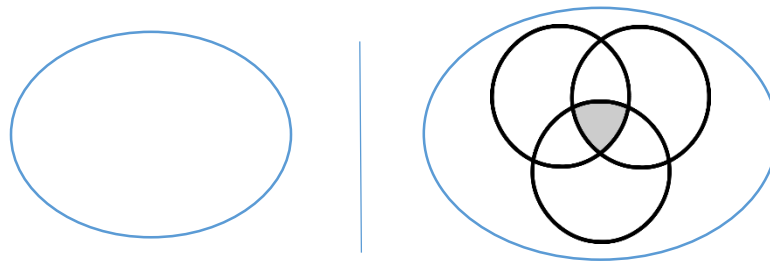


Figure 1: The Aristotelian space of reasoning forms

It is undeniable that Aristotle made the largest and earliest contributions to advancement of the very conception of science. In my estimation, his insights are unsurpassed. He begins with the space of reasoning. Figure 1 depicts the Aristotelian picture of the space of reasoning, and reasoning practices. I attribute the first articulation of a gulf between theoretical and practical reasoning back to Aristotle, who distinguished strongly between “common sense” (where that also included common or “folk” theories of everything) and disciplinary thinking, which includes distinctive disciplinary modes of reasoning (represented by the overlapping circles in Figure 1). These latter are discipline-specific, refined forms of reasoning—*taught* forms that we learn to employ when we step into the role of apprentice in a scientific practice. This is a view of the space of reasoning norms that I very much support.

What I like best about this picture is the line. It represents the difference between distinct reasoning enterprises, dividing common sense (practical reasoning) from pure theoretical reasoning. Theoretical reasoning is a pure enterprise—an enterprise with a single goal: truth. *Pure* in this context means simply unmixed with other concerns. Pure reasoning is strategically simple—there is one goal only, and no other objectives are balanced against it. In pure reasoning, all the resources of inquiry are put in service of the single goal. In theoretical reasoning, one simply pursues truth; one does not work out what to do about it, nor balance the value of this pursuit against the value of other pursuits. Truth is the only objective of theoretical reasoning. Of course we are talking about the (ideal or normative) enterprise of reasoning; we are not talking about reasoning as performed in real time by real individuals. The latter must be a subject for another occasion.

By contrast, because practical reasoning is allowed, even required, to comprehend many goals, it is a mixed enterprise, in which one of the primary tasks is to balance objectives one against another in a context-sensitive way—which is quite different from weighing evidence as to truth. Some philosophers hold that truth is just another good that one can balance against others. Others maintain that truth is not even a legitimate human aim—humans aim at advantage through and through. (Some pragmatists can be read this way.) That’s the subject for another occasion as well (but cf. Thalos 2013b). Long story short: for the Aristotelian, truth is an unconditional imperative; it’s not a good in the sense of being susceptible to being enjoyed and balanced against other goods. This is not an implausible idea: truth is not something that is directly enjoyed and experienced by individuals. Specific truths might be directly experienced, but not truth as that which they have in common and to which knowledge claims answer. Truth, in the singular, has a dignity and not a utility. In the economy of theoretical reasoning, utility has no place.

Contrast this distinctly Aristotelian view with two contemporary views on reasoning. First is the view that reasoning is undifferentiated, with no philosophically significant lines of demarcation. Pragmatism is a species of such a view. In pragmatism, every goal is balanced and traded against every other because no aim is unconditional. Utility is the very guide of life.

A second contrasting contemporary view (depicted in Figure 2) depicts reasoning as indeed differentiated, but the differentiated spaces are all overlapping, and in addition there are spaces also for “all-things-considered” reasoning—reasoning that transcends and crosscuts all the specific forms, where different considerations can be balanced against each other and where tradeoffs between different concerns are adjudicated. While this picture explicitly depicts a lot of differentiation in reasoning, and boundaries between different forms of reasoning, it doesn’t depict any kind of serious gulf—any lines of the sort we see in the Aristotelian picture of Figure 1, between practical and theoretical reasoning. The point now—and this is a point with which the Aristotelian most emphatically agrees—is that differentiation does not as such constitute a barrier to combination. The barrier or “gulf” between practical and theoretical denotes something else.

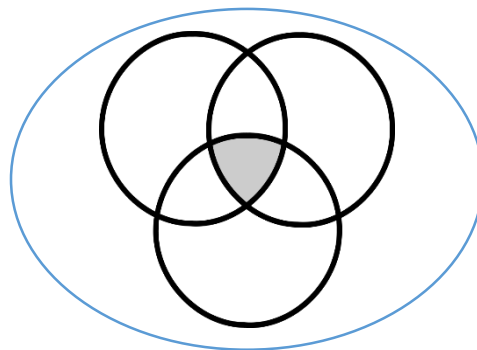


Figure 2: A contemporary conception of the space of reasoning forms

So why is there a barrier in the Aristotelian space of reasoning, where the contemporary picture of Figure 2 does not even acknowledge the space marked off in the Aristotelian picture as distinct? What does Aristotle's line denote? Answering this question will take us back to where we began—back to the question of what science consists in.

Practical reason

Aristotle, as we have already observed, distinguished strongly between knowledge and common sense. This is for a good reason. It is because he recognized the importance of reasoning as such, and the relevant discipline-relevant forms of it especially, in the securing of knowledge. For Aristotle, the reasoning basis of knowledge is deep. He held that intellectual inquiry – inquiry for the sake of truth – falls into natural categories that today we refer to as “disciplines,” differentiated by proprietary standards of inquiry (standards of reasoning broadly conceived). Aristotle insisted that standards of inquiry differ by discipline. For example, the standards of proof and evidence in logic and mathematics should not be applied in equal measure to the study of nature, or to politics. Three points will help us understand how Aristotle's idea is different from those that prevail today.

First, much of what counts as knowledge possession to a modern philosopher's sensibilities would not even amount to knowledge for Aristotle, since its reasoning basis is too shallow. The ability to correctly recite the price of tea in China, as a one-off event, would not count as knowledge. Second, and more importantly, a reasoning-oriented view of knowledge would resist the modern philosophical sensibilities that speak of having knowledge of isolated facts or propositions (*epistemically unconnected* is the technical term, cf. Hoyningen-Huene 2013). Finally, a reasoning oriented view would center on differences between individuals as bearers of knowledge, on the one hand, and communities, on the other. In recent times we have come to appreciate that “quality control” over a knowledge repository is a community undertaking (Longino 1990, 2002, and Kitcher 2001). Thus individuals, to possess knowledge, must be appropriately connected to a corresponding repository's safety nets for knowledge—to the bases of evidence (data, experiments, journal articles, etc.) as well as to networks of argumentation in support of a variety of (competing) ideas and theories. Knowledge—anything resembling knowledge of a complex world by limited knowers—will very likely bear these systemic qualities.

None of these points apply when we are considering instead the practical space of reasoning rather than the theoretical. Practical reasoning aims at action. And action is quite frequently, albeit not exclusively, something that has to be performed by individuals for personal ends (as contrasted with the aim of truth). Moreover, many beliefs are acquired simply for the sake of action—not for the sake of truth. The interests in those cases are not contemplative. These are the sorts of beliefs Aristotle refers to as “common sense.” They are “common” because they do not comply with specialized (discipline-specific) standards of inquiry—and are not obliged to do so. In fact, they do not comply—neither are they obliged to—with *any* standards. They are measured by the extent to which they serve their hosts, not the extent to which they adhere to standards that serve the goal of truth. Common sense answers only to its users.

And so now we have an account of the line of Figure 1. It divides between knowledge, on one side, and other intelligent activity, on the other. Common sense is on the side of “other intelligent activity” because common sense enjoys no standards of inquiry. It is not a discipline. It is an activity of practical, as contrasted with scientific or disciplinary, life. It is not contemplative. Knowledge is relatively rare, at least in certain epochs, in that it is the product of science. It is commonplace only conditionally, and only to the extent that scientific knowledge is disseminated well and freely. If scientific inquiry had never been conducted, or if it were secreted in the temple of a holy priesthood, then there would be no knowledge spread across the face of the globe: the planet would be covered only in abject common sense, or in beliefs that have not been subjected to the high standards of evidence.

Aristotle’s theory of science and his conception of knowledge are one and the same conception. I propose to use the label “science” for all of what Aristotle would have called knowledge. Hence it applies to anything that accepts the authority of a coherent set of standards of inquiry that aim at truth.³ Coherent standards tend to be focused on special problems or topics; they comprise intellectual disciplines. Any enterprise without coherent standards falls on the side of “other intellectual activity.”

Philosophy is a discipline with coherent standards of inquiry; it also aims at truth. Thus philosophy is a science. This is not to obliterate the differences between philosophy and (say) physics. It is instead to uphold them. And to uphold them in a way that respects the separate dignities they represent. It is also to uphold the dignity of the pursuit of truth, and to distinguish it from activity that does not serve that noble goal. (It is noble insofar as its pursuit is orthogonal to pursuit of that which serves oneself.)

However this is not to denigrate intellectual activity that serves other masters: other masters must indeed be served—we aim at health, prosperity and happiness. They are worthy goals. May the efforts aiming to advance them also prosper. But the enterprises that aim at these ends cannot, insofar as they do so, be called science. They are something worthy, but they are something else. Science is indeed a term of commendation; but it is not the only one.

What then of scientism?

Science without boundary police

The account of science just laid out—meant as a revival of an old theory of Aristotle’s—does speak of boundaries. They are boundaries between rather than as a cordon around the sciences. Crossing such boundaries, if done right, can serve the sciences on both sides—such as when a discovery in mathematics render service elsewhere and when a discovery in philosophy can render service elsewhere. It is appropriate to the dignity of knowledge that it should be open—to both contributions and to appropriations—from those who are not officially initiated into the relevant specialisms. We have spoken also of enemies of the sciences—reductionisms that would obliterate entire disciplines with bad arguments. Of these everyone must be mindful, since bad arguments are not welcome anywhere. We have also spoken of common sense, as that which is not-science but which nonetheless might be useful in serving ends other than truth. When it is justified, it is justified purely in relation to those (non-knowledge) ends and by its (good) service to them.

³ I don’t say “comply” because accepting standards and actually complying with them (the difference between trying and succeeding) should not divide between science and non-science.

Imagine now a hypothetical scenario: someone, perhaps in imitation of Einstein, seeking to serve his reputation at the expense of a discipline (like philosophy), and to claim his 15 minutes in the spotlight, makes scornful remarks to the effect that philosophy is not science and hence lacking merit. Is this an intellectual error worthy of a special label, say “scientism”? Well it is certainly an intellectual error: the statement is flatly false because philosophy is a science, in the broad sense we have been courting. So yes, there is an intellectual mistake in this. But in a different regard there is a sideways truth—a truth that is misconstrued: philosophy is not like physics insofar as its standards of inquiry are different. That fact, to which all will happily assent, should not be minimized. But now how about the derogation? Statements like this one can be offensive, dismissive and condescending. And of course we can innovate a concept like “scientism” to fit the crime as so described. I prefer to call out the bad (meretricious) behavior, name its author as self-serving, and point out the clear fallacy. In my estimation, falsehood is a harsh enough foul. And this crime deserves no special name to raise it to heights of special scrutiny—better it should be called a flat fallacy, on all fours with the error of an earth-centered solar system.

Thus I hold no brief for “scientism” construed as a shaming term for border-crossers and disparagers of others’ disciplines. I can think of no good service that the border patrols it speaks of can be put to. I cannot think how a regulative theory of science, one that aims to preserve its dignity, illuminate relations among the sciences, and throw light on their distinctiveness from common sense, can be improved by border patrols. The boundaries between sciences require no policing. Indeed, we are better served by scientists acting the part of friendly kibitzers, helping each other and learning from each other’s findings and methods. We are better served by healthy exchanges over the fence (and under it too) than by borders to keep out intruders. Thus my vote is to deny a mandate to would-be border patrols.

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