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POTENTIALITY, ENERGY AND SWAY:
FROM ARISTOTELIAN TO MODERN TO POSTMODERN PHYSICS?

1. THE PROBLEM OF COMPARISON / 28
2. ARISTOTLE ON POTENTIALITY / 36
3. ENERGY IN MODERN PHYSICS / 34
4. THE POVERTY OF MODERN SCIENCE / 36
5. THE POVERTY OF ARISTOTELIAN SCIENCE / 38
6. TOWARD A POSTMODERN PHYSICS / 34-41

Heidegger argues in several texts that modern science embodies a way of revealing that dominates its objects. That is, science “mathematically” projects an automatic conception of objectivity, and then accepts only those data which are verifiable and calculable in accordance with this projection. Modern science is thus inherently “technological,” even before it is applied to the construction of machines: our modern surveillance of beings is a type of cognitive manipulation, even when we refrain from mechanical manipulation.

Well after he had established this interpretation of modern science, Heidegger encouraged us to think through the problem of the relation of science and technology for ourselves, perhaps in order to remind us that philosophy is nonmathematical—that it is not the application of any axioms. Heideggerian or other. He asked at the end of his life, in 1976, “Is modern natural science—as one supposes—the foundation of modern technology, or is science itself already the fundamental form of technological thinking, the determining preconception and constant incursion of technological representation into the executing and organizing machination of modern technology?” This essay takes some steps toward addressing Heidegger’s question.


3 Neuzeitliche Naturwissenschaft und moderne Technik, Grundwort an die Teilnehmer des ersten Colloquiaums vom 14-16, Mai 1976 in Chicago,” in: Reisen und andere Zeugnisse eines Lebensweges 1910-1976, GA 46, p. 747. The German text and another English translation are also available in Radical Phenomenology: Essays in Honor of Martin Heidegger, ed. John Sallis (Atlantic Highlands, N.J.: Humanities Press, 1978), pp. 1-4. An earlier form of the present essay was read at the 200 Heidegger Conference at Fordham University, which was organized by Prof. Babette Babich and devoted to the question that Heidegger asks in his “Grundwort.” My thanks go to Prof. Babich for hosting the conference, to Prof. Lawrence Hacht for his commentary on my essay, and to the other participants in the conference for their insights.

It will be obvious that I am consistently indebted to Heidegger, and I will refer to him at several points, but my goal is to initiate an independent line of thought.

What should be our first steps in thinking through the essence of modern science and technology? In the case of science, we could ask whether it has its own definitive conception of being. In the case of technology, we could ask what it means to make and use things. (Whether or not technology is ultimately something more than making and using—such as a way of revealing—and whether or not modern technology essentially differs from traditional handicraft, modern technology certainly emerges from the universal human activities of making and using things, and has some essential relation to these activities.)

These first steps soon lead us to the question of power. One of the central ontological concepts of the fundamental modern science, physics, is the concept of power as energy. Being, travels, receive it, conserve it, and are transformed into it and out of it. Further, in order to understand this power, we must employ one's own power and employ the power of things. Is the modern physical concept of energy related to the modern technological way of deploying and employing power?

This essay focuses on the first part of this problem—understanding the conception of power that characterizes modern science. This can be done only by way of contrast to other modes of “science,” that is, organized ways of knowing—for only if there are other, at least partially legitimate, ways of knowing there is any such thing as “modern Western science,” as distinguished from science as such. We might compare Western science to Chinese science, for instance. It may make more sense, however, to contrast modern Western science to Aristotelian science. Modern Western science defines itself in opposition to its own predecessor, Scholasticism. Scholasticism relies on Aristotle's project of understanding the principles and causes of beings, and this project attempts to preserve and surpass the best of earlier Greek thinking. The thought of Aristotle, then, is the crux of pre-modern European knowing.

In what follows, then, I compare Aristotle's concept of σωφρόνος (potentiality) to the modern concept of power as energy. I then propose that both the Aristotelian and the modern standpoints have problematic limitations. Modernity's difference from Aristotle thus suggests the need for a transformation—not a return to Aristotle, but the development of a postmodern alternative to both Aristotelian and modern science, which I label "away." An extensive exploration of away and its relevance to technology falls beyond the scope of this essay—but we can expect that a change in our understanding of power would have deep consequences for our use of power and our approach to the powers of nature.

1. THE PROBLEM OF COMPARISON

What does it mean to "compare" modern and Aristotelian science? Can we simply point out a series of different features and discuss their respective advantages? If so, what language, what concepts, can we use as a neutral medium in which to represent those differences? One might reply that the neutral medium is the natural medium—the concepts and words that come naturally to anyone who is experiencing nature without prejudice. But phenomenology has taught us just how difficult it is to put forth a neutral medium and perhaps impossible—it is to be "natural" and "unprejudiced" in our description of phenomena. As Heidegger puts it, "the 'natural' is always historical"; in other words, what we take for granted is just the residue of a historical process in which sense is constituted and configured.4

If we accept this view, then what is left of our project of comparing two modes of science? Maybe we should abandon the notion of a neutral language and use two languages—one ancient, one modern. Then we can simply let the contrast between the two speak for itself. In this case, however, do we also give up all right to judgment? Are we then reduced to making the innocuous observation that two approaches are "different," without hope of showing that one discourse, language game, or system is truer than the other? Indeed, one of Heidegger's remarks on the topic seems to suggest that because ancient and modern science are completely incommensurable, all judgment would be inappropriate:

We cannot say that the Galenic doctrine of freely falling bodies is true and that Aristotle's teaching, that light bodies strive upward, is false; for the Greek understanding of the essence of body and place and of the relation between the two rests upon a different interpretation of beings and hence conditions a correspondingly different kind of seeing and making and things. No one would presume to maintain that Shakespeare's poetry is more advanced than that of Aeschylus. It is still more impossible to say that the modern understanding of whatever it is, is more correct than that of the Greeks.5

Do we, then, have to give up the very question of the truth of a way of doing science?

Heidegger is not claiming exactly that, however. He forbids us to say that the modern understanding is "more correct" (richtiger) than the Aristotelian understanding. Since truth, for Heidegger, is not correctness but unconcealment, we might still be able to ask whether one or the other mode of science goes deeper in its unconcealment of being. We might be able to make this judgment by counting up the number of successful predictions made by each mode of science, or by establishing that one approach is practically more advantageous than the other; however, we may come to see that the way of unconcealment that is typical of an approach is relatively rich or impoverished.

The crucial question is what "rich" and "poor" would mean here. I propose that a "rich" way of unconcealment is a way that brings a qualitative plurality of phenomena to light, that remains open to genuinely new experiences, and that makes it possible to discern connections between human beings and other beings without reducing all beings to the same level. A "poor" way of unconcealment forces all experiences into a single mold, leveling the phenomena and making them display themselves only according to its strictures. In particular, such a way of unconcealment might tend to conceal the distinctively human features of our being, highlighting instead certain features that we share with all beings—the ontological lowest common denominators, so to speak. This approach would lead to a reduced understanding—or, for those who suspected its inadequacy, it could create a sense of a violent and incomplicable rupture between humanity and the rest of the universe.

Even a superficial acquaintance with Heidegger's writings on science and technology makes it clear that he sees modern science as a "poor" way of unconcealing in


The opening of the passage just quoted does forbid us to say that Galileo's doctrine is "true" (wahr). But this clearly means "true" in the sense of "correct," since Heidegger contrasts it with "false" (falsch). The issue here concerns ways of describing natural phenomena, rather than the accuracy of particular descriptions. These ways of describing cannot be termed correct or incorrect—although, as I am about to argue, they can be said to unconceal beings either rigidly or poorly.
the sense just explained. Modern science, in his judgment, powerfully reveals an abundance of correct facts, but at the price of reductiveness.

If it is fair to try to form a judgment about the relative richness or poverty of a way of unconnenting, then we do not have to give up the question of truth when we realize that "the natural" is always historical. Instead, we have to find a way of thinking historically about truth as historical. Comparisons between two modes of science, two scientific discourses, might then be possible—not from the secure standpoint of some neutral, ahistorical language, but with the tentative touch of bilaterals (of dialogues) who try to venture as far as they can into the things themselves with the help of the languages into which they have been initiated, always trying to push themselves and their words to their limits. 7

If the project of comparing two modes of science seems provisionally legitimate, then we are faced with a series of questions:

1. What is the crucial difference between Aristotelian and modern science?
2. Despite the undeniable productivity of modern science, is Aristotelian science superior in some respects? That is, is Aristotle’s way of unconcealing somehow "richer?"
3. Does Aristotelian science in turn have its weaknesses—aside from its inability to generate the theoretical and technological payoffs that are distinctive of modern science? In other words, is there a nonmodern way of criticizing Aristotle?
4. If we find that both Aristotelian and modern science prove to be limited or poor in certain respects, then can this judgment point us toward a new way of knowing—a postmodern science, so to speak?

While I cannot fully answer these questions here, I propose that we can make some inroads into bringing up the Aristotelian concept of ἴδιως and the modern conception of energy, and assessing the difference between them with Heidegger’s help.

2. ARISTOTLE ON POTENTIALITY

Near the beginning of the Nicomachean Ethics (I, 5) Aristotle lists some popular candidates for the good: the life of pleasure, the life of moneymaking, the life of study, and the political life. To the modern reader it may well seem that he has left out an important candidate: the life of power. The closest relative to such a life in Aristotle’s thought is the life of politics. Of politics he says: “It is the life of those who either honor or virtue. Why is power not even mentioned as a possible ultimate goal? The answer must be that Aristotle would dismiss the power-seeking life for much the same reason that he dismisses the moneymaking life. Money is essentially a means to an end—it is good of itself only as a tool. It proves its value only in its own disappearance, only in the event in which it is replaced by something further good. 8 The possession of money is only a special case of power. Power is the capacity to do something, and it is only an indispensable means to this end, not the end itself. Power need not use itself up in its use, as money normally does (my power to write is not destroyed by my act of writing). But power always has its being only as a way to some further goal. To anyone who said, “Power is the good,” Aristotle would reply, "The power to do what?" He would point out that this "what," whatever it might be, would necessarily be a higher good than the power to do it.

In the Politics, too, Aristotle avoids granting power a paramount status. He distinguishes among various types of rule—such as the rule of master over slave, of husband over wife, and of a political leader over fellow citizens—insisting that each is different in kind and has its own distinctive end (Pol. 1, 1-2). Those who view the goal of politics as domination are confusing political rule with rule over slaves (Pol. 7, 1172). Even in the case of rule over slaves, the goal of this rule is not "sheer power," as we might call it, but the furthering of the master’s προσαρµάτων of living well (Pol. 1, 4, 1254a7). Power is always the power to achieve some particular end, and there is no such thing as power per se for its own sake regardless of its further purpose. As insightful as these thoughts might be in regards to human action, they are rooted in an interpretation of being that far exceeds ethics and politics. Given Aristotle’s understanding of the very notions of “power in itself” and “power for its own sake” are ontologically incoherent. We need only recall a few points from the Physics and Metaphysics.

Although Aristotle does not have a finished system, if there is a master concept in his thought it may well be actuality—ἐνέργεια or ἐνέργεια (Heidegger calls ἐνέργεια “the fundamental word of [Aristotle’s] thinking.”) The concept of ἐνέργεια is so primordial that it cannot be defined (Met. 6, 6), but in rough terms, it indicates being-at-work—the performance of the function (ἐργον) that is the distinctive end (τέλος) of a certain kind of thing and is thus crucial to the thing’s form or essence. (This is, at least, the central meaning—for there may be as many meanings of actuality as there are meanings of being; Met. A7, 1017b1-3). As Heidegger puts it, ἐνέργεια is “standing-in-the-work in the sense of presenting in-itself in its being or actuality (if we may keep the traditional translation), the entity comes forth, emerges as what it is.” 9

Actuality’s holdmate is ἴδιως, potentiality—or as Heidegger suggests we should call it, appropriateness. 10 Aristotle insists that potentiality has being—it is not nothing.


9 The History of the Concept of θέων, p. 218, “Von Wesen und Begriff der θέων,” p. 350. Heidegger would strongly object to keeping the traditional translation, for he proclaims that with the Latin translation of ἐνέργεια asactus “the Greek world was toppled” (ibid.). I will consider this reason for his historical claim below (section 4), but it seems convenient to use the traditional translation, with the caveat that we may need to reinterpret the meaning of the word alongside Heideggerian lines.

10 Ibid., p. 218, German p. 355. Again, Heidegger objects to the traditional translation, for he explores in section 4 below. Heidegger’s more extended essay on Aristotle on ἴδιως is the 1931 lecture course Aristotle’s Metaphysics Θ 1-3. On the Essence and Actuality of Force, tr. Walter Brogan and Peter Warnek (Bloomington: Indiana University Press, 1995), Aristotles, Metaphysics 6.1-3. Von Wesen und Weislichkeit der Kraft, GA 33. This is a sympathetic interpretation that only hints at the limitations of Aristotle’s thought (e.g. pp.
ing (Met. θ, 3)—but also that it is subordinate to actuality. Actuality is prior to potentiality in three ways. Every potential being (say, a chicken egg) is generated by an actual being of the same kind (in this case, a mature chicken); the potential being is intelligible only in terms of the actual being; and the potential being possesses the form less than the actual being does (Met. θ, 8). To sum all this up in a way that Heidegger would prefer, we can say that those beings that are apt to come forth yet have not fully emerged into presence are less complete in their presence than those that have fully emerged.11 The principle seems circular, almost tautological—but perhaps this is the case with all first principles, and we should not confuse being circular with being inconsequential. The implications of the actuality of the potential over the potential pervade Aristotle's thought—from ethics to physics, from biology to theology. If, for instance, there is no place in Aristotelian ethics and politics for power as an end in itself, this is because dórōs—the potential or appropriateness for a certain work—is subordinate to évēpēs—the performance of this work.

The priority of actuality over potentiality also permeates Aristotle's Physics. Here he considers the realms of the beings that are intrinsically subject to motion, where "motion," or "becoming," is understood broadly, encompassing not only local motion (change of place) but also change of quality, quantity and form. Aristotle's most general definition of motion is, notoriously, that it is the actuality of the potential insofar as it is potential (Phv. ΙΙΙ, 1). I take this to mean, for example, that before I walk from Central Park to Times Square, I have the potential to do so, but the potential is not being actualized. After I have walked to Times Square, the potential is not being actualized either—for I am actually there already. The motion, then, is precisely the process during which my potential to walk from Central Park to Times Square is being actualized as potential: it is unfolding itself, displaying itself in its capability. In Heideggerian language, to move is to come to presence.

Coming to presence, however, always remains subordinate to full presence. To put it in a formula, "coming is for the sake of being" (De Partibus Animalium, Ι, 1, 640a19). In particular, motion is subordinate to the active actuality that Aristotle in some contexts calls propēs. A kóivon, or motion, tends intrinsically toward its own termination—for just as my money is spent in being spent, motion is spent when it is consummated and consumed in actuality (for example, when I reach Times Square). A propēs, however, is ongoing even when it is fully actualized. According to Aristotle, such activities include seeing and thinking (Met. θ, 6, 1048b30-35). The act of seeing is fulfilled at every moment in which it goes on; it does not tend toward its own termination, and thus is not a motion. In short, seeing and thinking are ends in themselves; for Aristotle, this is not a "value judgment" but an ontological fact.12

The question of propēs takes us full circle to Aristotle's ethics and politics: any behavior that must be understood as kóivon rather than propēs—for example, the production of useful things and the tēxenos that guides it—is inferior to propēs, is "slavish" (Pol. ΙΙΙ, 4, 1277a26). It should thus be assigned to slaves—whose purpose is to further the propēs of the master.

A few other consequences of the priority of actuality over potentiality are worth mentioning. For one, the principle makes evolution impossible: if a chicken egg is always produced by a chicken, then the species chicken is eternal. It is inconceivable that there would be a process by which new forms of beings might develop. Furthermore, in theology the principle implies that the perfect being is the most actual and, thus has no potential at all. Aristotle's god is not omnipotent but omnipresent (Met. Α, 7, 1072b5-16). Rather than potency, the god is sheer actuality, the pure performance of the highest propēs—thinking.

What does all this have to do with the character of Aristotle's science, with the richness of his mode of knowing as a way of unconcealing? We are not ready to make any judgments on Aristotle's science before we contrast it with modern science, but if the highest actuality of the omnipotent being has turned out to be thinking, then surely the potential is not irrelevant to the question of science. In keeping with Heidegger's insight that all knowing presupposes a sense of being, I have not laid out Aristotle's "epistemology" and then shown how it applies to the question of the potential. Instead, I propose that Aristotle's views on knowledge are determined by his understanding of actuality and potentiality. Hence, according to Aristotle, knowing is fulfilled or actualized when, provoked by our perceptions of present beings, we grasp them in their very way of presence—in their being (in more traditional terminology, human experience moves toward intellectuality, toward the "inductive" grasping of essence.) Intellection (vērō) grasps being, and does so with out motion, without any residue of potential—which is why it is the divine activity. In vērō, the presence of present beings becomes fully present to us.13 Then we can proceed to "demonstrate" (make evident) various patterns and characteristics of beings.

11 "In the Essence and Concept of Φως," Heidegger blurs the distinction between kóivon and propēs by insisting that évēpēs is "the higher state of nothingness" (English p. 217, German p. 345). This interpretation is at best misleading, and I can only suppose that Heidegger is trying to give the Aristotelian understanding of being a reading that is literally as "dynamikos" as possible, for the sake of bringing it closer to his own conceptions. To counter Heidegger's reading, we need only point out that he refers to "the movement of seeing" (bid.), whereas Aristotle's point is precisely that seeing is not a kóivon or movement. It is odd that Heidegger does not even mention the word propēs, which Aristotle uses to characterize being. We could also note that the Aristotelian god, who is complete évēpēs and is performing the propēs of thinking, is utterly free of kóivon—the god is precisely the unmoved mover (Met. Α, 7, 999a18-19).

12 As Heidegger puts it in an elucidation of Aristotle's dórōs, "God is not powerful, and omnipotence, considered properly, is a concept which dissolves, like all its companions, into this air and is unthinkable. Or, if God is powerful, then he is weary and in any case something other than what is thought in the vulgar representation of a God who can do anything and thus is degraded to an omnipresent being": Aristotle's Metaphysics Θ-Ι, 135, GA33, p. 135.


14 Because vērō is both a grasping of actuality and an actuality itself, Aristotle can conclude that the divine activity (the activity that is most fully) is a self-presencing, a grasping of and to itself (vērō τοιαύτη: Met. Α, 9, 1070b55).
Newton’s formulation mass tends to continue moving in a straight line—but toward nothing in particular. The notion of \( p_0 + \Delta \) drop out of physics. Seeing and thinking—Aristotle’s favorite examples of \( p_0 + \Delta \)—now have to be conceived in terms of change of place, as complex systems of local motion. (This approach cannot do justice to the phenomena in question—at least, if we follow the modern philosophers who distinguish consciousness from matter because they find it incoercible to reduce perceiving and thinking to local motion. They assume, however, that that which is intelligible in terms of local motion—which is precisely the assumption that makes these thinkers modern instead of Aristotle’s.)

Instead of merely inverting Aristotle, then, modern physics establishes a new language that prescribes from both Aristotle’s "actuality" and his "potentiality." What does this new language achieve? First, there is no doubt that it brings clarity, unity and mathematical precision to our descriptions of spatial motion. But aside from this type of fruitfulness, the modern approach generates a new pair of concepts—energy and power. Energy is freed from function. No longer the driving force and movement more anticipations of full presence. To be present means nothing other than to move (rest is only a special case of motion), and movement is itself power—f or it is kinetic energy. This power is literally in-finite: it is not bound to any particular "end," but is simply the capacity to resist or redirect other movements. To resist which movements, to redirect them toward what? It does not really matter.

Just as Aristotle’s principle of the priority of actuality has an aura of circularity, modern physics operates in accordance with a principle that seems no less self-evident: energy (the power to affect a motion) makes possible all work (the establishment of any particular motion or system of motions). But the liberation of power that is expressed in this tautology has implications just as far-reaching as those of Aristotle’s principle in biology, a theory of evolution becomes not just a possibility but a demand (Descartes already calls for it). It is no accident that “existentialism”—the liberation of human freedom from a preestablished human essence—was first practiced already in Renaissance humanism. Freedom—not “goodness” as the actualization of a form—now becomes the ground and goal of distinctly modern ethics and politics. Banished from nature, goodness takes refuge in the subject, where it will take the form of freely posited “values.” God, metaphysically conceived as the “perfect” (that is, fully actual) being, has already been sentenced to death by existentialism, and Nietzsche’s “will to power” lies around the corner.

Power itself in power, for the sake of power, now becomes thinkable.

3 For Heidegger’s comments on the Newtonian concept of force in contrast to Aristotelian physics, see What is a Thing? pg 85-86, Die Frage nach dem Ding, pp. 66-68.

35 DICARTES: Discourse on Method, AT 45, One could argue, however, that the origination of "new forms" is still uninnovative, as it was for Aristotle. The classical concept of form no longer has any role in modern natural science (the biological concept of "species" is a remnant that has to be reconceived). As effectively as we can describe different species of living things and recog- nize their evolution we are puzzled if we are asked to identify the ontological differences among humans, fish, amoebas and amino acids. The "higher" beings are more complex, but in essence, from the modern point of view, all these systems are just configurations of local motions. As William James in The Principles of Psychology (1890), what is living is just a special case of what is motion. See also Gay Scier (1909), what is living is just a special case of what is motion. (Gay Scier, p. 61). Of course, being true to power is neither 

36 DICARTES: Discourse on Method, AT 46, The word proper can no longer have any natural meaning. The question of appropriate-
Is the modern conception of power linked to the modern way of knowing, the modern mode of science? As we have seen, according to Heidegger, modern science is essentially "mathematical"; it projects the character of its objects in advance. This mode of knowing is not unrelated to the Aristotelian comprehension of forms through intellect; in both cases, what is grasped is present beings in their own way of being. (For modern physics, this means representing the invariant laws of nature by means of formulas.) However, for Aristotle, the object of science is essentially "receptive of form." For the moderns, in contrast, the mind constructs forms—as Kant argued so emphatically. This means that the modern mind or subject is conceived as preceding form, as the grounds of form. The subject's power to construct form is thus prior to the actuality of objects—and this subject, when it constructs the forms of objects, constructs it precisely in such a way that the power of objects is construed as prior to their actuality. Just as in Aristotle, there is a peculiar symmetry between modernity's way of knowing and modernity's understanding of what it knows. It may be that an age's understanding of the nature of being is the basis for both that age's knowledge of beings and its knowledge of knowledge itself, even though it may sometimes seem that one of these two sorts of knowledge precedes the other.

4. THE POVERTY OF MODERN SCIENCE

How can we begin to assess whether the Aristotelian and modern conceptions of potentiality and power are "rich" or "poor"—that is, whether their ways of understanding beings are fertile or reductive? Aristotle seems to have an immediate advantage because of the intrinsically pluralistic character of his concept of actuality. For Aristotle, nature consists of natures—distinct ways in which beings actualize their specific forms and functions. Although we can investigate "being qua being," the investigation of a distinct region of beings—living things, for example—will always require a fresh appreciation of the unique characteristics of this region (cf. De Anima I, 1, 11-19). The specific natures cannot be derived from the universal.

In contrast, modern science displays a leveling tendency. Even though in practice psychologists, biologists and chemists use concepts that are unique to their disciplines, there is a widespread conviction that these concepts are the same, in principle, to be reducible to the concepts of the fundamental modern science—physics.27 There is a tendency to focus on factors that lend themselves to study by our physics (what

26 Although it eludes the priority of Évérpes, modernity does not escape the understanding of being as presence. The energy of a thing is merely a set of relations it has to the motions of other things, relations which can be calculated in accordance with the permanent laws of nature. Is possible, then, is still understood in terms of what is fully present—namely, natural law.

ARISTOTLE: De anima III, 4. Our also has a productive aspect, but—so it seems—it activity consists in "producing" the reception of the forms by the passive our, where production means an enabling, much as light enables colors to shine forth (De Anima III, 5). This production is not a making, but an allowing-to-come-to-presence.

28 As Heidegger says, natural processes are reduced to measurements of local motion: What is a thing? p. 87, Die Frage nach dem Ding, p. 68.

29 What we are seeing here (the lateral prefrontal cortex) seems to be a global workspace for organizing and coordinating information and carrying it back to other parts of the brain as needed, Dr. Duncan said. "It is the relative performance of this cerebral workspace, he said, that intelligence tests appear to measure." NATALE ANGERER ("Die Braut des Konfus: A Key Position Solver," Die neue New York Times, July 21, 2000. For Aristotle's claim that both formal and material investigations are necessary when studying living things, see De Partibus Animalium I, 2, 640b5-641a18; De Anima II, 1. In making this claim Aristotle is combating the reductive tendencies of many of his predecessors; reductionism is not even an assumption of modern vi


31 Aristotle call the material and efficient causes) at the expense of the distinctive ways in which phenomena are actualized (the so-called formal and final causes). For instance, today it is a commonplace to claim that some cognitive processes are "really" the functioning of a particular part of the brain—as if discovering the material basis for the ability were all we needed in order to understand the essence of this ability.

Why does modern science have this reductive tendency? The answer may seem easy: because of the power of modern science to construct abstractions about beings: rather than receiving their multiplicity of forms, it stamps them with a single form of its own, representing them as uniform. For the same reason, modern science is intrinsically "technological": things become nothing but objects that are representable by the subject; objects that are susceptible to conceptual molding. This is the case well before the triumph of mechanical manipulation, "technology" in the usual sense.

But perhaps this answer is a little too easy. We should at least pause to consider the paradox that the reductive tendency of modern science coincides with the power that seems, on the face of it, liberating and open-ended. Power is no longer the potential to actualize a pre-established form—instead, it has an open future, an infinite realm of flexible possibilities. Nature is no longer mere reproduction, but allows for genuine creativity—one might think. However, the in-finitude of modern power is purchased at the price of a restriction of the character of beings in general. They are conceived in terms of non-teleological change of place; the lack of a teleological liberates the power, but it is set loose upon a universe that has been reduced to the merely calculable and measurable. It is as if in order to create infinite freedom, we had leveled all the mountains and filled all the valleys, setting up an infinitely traversable wasteland—one endless road, with no curvatures and no destination.

We could also consider the poverty of modernity via Heidegger's terse proclamation in 1939 that with the Roman translation of Évérpes as acta, "with one blow the Greek world was toppled." In the Roman conception, according to Heidegger, "actuality" means doing or effecting, and "potentiality" means "the ability" (Hemeligen). He claims that this way of thinking makes it seem plausible that potentiality is prior to actuality—which I have argued (although Heidegger does not say so here) is precisely the modern view. From Heidegger's attack on the "Roman" concepts, then, we may gather something about how we would judge modernity (this may be true of all his remarks on the Roman Empire). What does the "Roman" approach miss? If we extrapolate a little from Heidegger's essay, we can see that the "Romans" take potentiality and actuality as features posessed by individual entities—as an entity's power to act and its action itself, understood as altering itself or other entities. What has been lost is the ontological sense of Êöion and Évérpes—the way they describe the emergence of presence...
encing of entities, rather than faculties or behavior of present entities themselves. The Roman understanding of power—and by extension, the modern understanding—is a symptom of the oblivion of being. This oblivion, in Heidegger’s interpretation, takes the form of “technology”—an unquestioned understanding of beings as representable objects and exploitable resources.

5. THE POVERTY OF ARISTOTELIAN SCIENCE

Should we return to Aristotle, then? Was modernity a mistake?

This is not, of course, Heidegger’s view. Although he interprets Aristotle sympathetically in many texts, he makes it clear that the fundamental experience of being that underlies Aristotle’s concepts is not the destination of his own thought. The Greeks understand being as “stable, enduring, permanent,” whereas we moderns are “at the point in time of becoming” and “every being is more than nothing other than becoming.” Heidegger does not question this ground, and his questioning brings him into the region of time and Ereignis.

Heidegger would say that even if being could make sense to us only as presence, we would still be called upon to think of the ground of this sense of being—its enabling origin—and that for this reason, we need to go further than the Greeks. But for our present purposes, we can catch sight of the limits of Aristotle’s thought by questioning in a more concrete and empirical direction, and with particular reference to potentiality and actuality. We can ask: are there aspects of our experience of beings that are the product of Aristotle’s principle of the priority of actuality over potentiality? First, there are facts that are more conveniently and elegantly described in modern concepts, facts that we all think of when we consider the advantages of modern science. Our astronomical observations invite a conception of space not as geocentric, but as heliocentric, as Euclidean. Though this view was anticipated by earlier philosophers, it is a modern view of scientific practice.

But facts and observations alone do not make a revolution. We could have continued to tinker with the Ptolemaic system to accommodate our new astronomical observations, and today’s “creation science” reminds us that evolution is not the only conceivable interpretation of the facts, either. Furthermore, we should not list the advantages of modernity over Aristotle while forgetting modernity’s own potentiality—its future-directedness. We need to respect the richness of Aristotle’s conception of nature while catching sight of its weaknesses. The task is delicate, and it brings us back to the problem of language. Do we have the words and concepts with which to criticize Aristotle without simply rehearsing the founding moves of modernity?

On ἐνεργεῖς and ἔννομοι as modes of presencing, see ibid., p. 219, German pp. 356-7. Only a few years earlier, in 1935-36, Heidegger himself was translating Søren Kierkegaard as “force” (Kræft, in quotation marks) and “capacity” (Vermogen): What is a Thing? p. 85, Die Frage nach dem Ding, p. 66. Heidegger himself, then, was not fully “de-Romantized” until at least the late thirties (a process, one could argue, not unrelated to his development of the concept of Dasein).


10 For Heidegger on Aristotelian place vs. Newtonian space, see What is a Thing? pp. 83-4, Die Frage nach dem Ding, pp. 64-7.

Here we can avail ourselves of Heidegger’s help. Being and Time embraces the strenuous project of finding the words to describe experience in a way that steers clear of both modern and ancient prejudices. The entity at stake in this description is, of course, ourselves. Leaving aside the question of whether Being and Time is ultimately a dead end, we can recall some of its fundamental claims about Dasein. If Dasein’s way of being is “existence,” where this signifies that its own being “is an issue” for it: we have a relation to our own being such that we can either win it authentically or fail to win it. What enables Dasein to have such a relation to its own being is the dimension of the future, or Dasein’s coming to itself in its ownmost Selbständigkeit, usually translated as “potentiality-for-being,” is a potentiality that is not subordinate to actuality. We are fulfilled or “actualized”—we come forth as the beings we are—only if our “potentiality”—our “can-be,” our ability to be—is preserved. To take this possibility as bound to some particular form of fulfillment, however, would be to misinterpret our very essences. Thus, the assigning of an objective τότε to life is “the misunderstanding of human existence in general.”

This statement aligns Heidegger with modernity, in a sense: by raising possibility above actuality, he rejects the Aristotelian priority of ἐνεργεῖς. However, he also avoids the reduction of the modern notion of power as energy. To have possibilities is not just to be ready to affect the motion of bodies, but to be enabled to understand—to be ready to deal with beings of all sorts, including ourselves, in such a way that they are revealed in the plurality of their various modes of being.

If Heidegger’s characterization of Dasein is appropriate, then there is at least one entity—ourselves—for whom the priority of actuality over potentiality is invalid. This is not just a small exception to the rule; it means that the rule is fundamentally inadequate. Not only is a universe that can include Dasein a radically non-Aristotelian universe, but because understanding is a matter of possibilities rather than actualities, we must reconceive our way of understanding this universe. We need a non-Aristotelian and non-modern way of knowing, a “science.”

6. TOWARD A POSTMODERN PHYSICS?

Without losing sight of Heidegger’s question regarding the ground of the truth of being, it seems that we are also called to develop an interpretation of being itself—the being of all beings—that avoids the pitfalls of both the Aristotelian and the modern modes of science. Of course, a new understanding of being does not simply drop
Nietzsche observes that for traditional metaphysics, "the higher is not permitted to grow out of the lower, is not permitted to have grown at all." The highest must have its own, inviolate sphere of being, where it reigns as causa sui. Reductive modern conceptions also prevent the higher from growing out of the lower, in a different way: the "higher" things are merely rearrangements of the "lower," with no qualitative difference from them. The first desideratum for our concept of "sway" is that it allow for the evolution of new forms in such a way that these forms can be understood as higher than that from which they have emerged. The lower must be understood as coming forth with a sway that enables it not only to fulfill itself, but to exceed its own boundaries, to generate new beings with new capacities—including ourselves. Sway is not only sway over this or that, but also an indeterminate sway that opens new possibilities.

Second desideratum: we need to understand how beings can allow for mathematics, in both the numerical and the broader Heideggerian sense, without being exhausted by this mathematics. The reductive gaze of modernity is both possible and fruitful—but how? Our notion of "sway" needs to clarify how, as beings burgeon forth in an excess of possibilities, they at the same time leave themselves open to the mathematical and to "technology." This brings us to a third and final wish. Heidegger suggests that we can learn to use things in such a way that we work with nature and respect its potential, rather than forcing things to yield their energy. How can the sway of things work both with and in our own sway? If we allow for the excess—for the overflowing possibilities that emerge from each thing—as well as respecting the distinctive sway that pertains to each thing's nature, will we find a way to use things without abusing them? We must hope that an interpretation of the sway of beings would help us answer this question.

3 The young field of complexity studies, popularly known as "chaos theory," seems to hold promises here.
4 Aristotle offered an analogous interpretation of mathematics (Met. M, N), mathematics abstracts from concepts and value in order to focus on the quantitative. But if we abandon the Aristotelian conceptions of motion and actuality, his explanation will not suffice.
5 Thoughts about the place of the mathematical cannot be expressed in purely numerical or axiomatic terms—they require language in all its historicity. Because a postmodern account of nature will have to use historical language, modern scientists will dismiss it as unscientific philosophy or poetry.
6 The old windmill's "sails do indeed turn in the wind; they are left entirely to the wind's blowing. But the windmill does not unlock energy from the air currents in order to store it." Heidegger: "The Question Concerning Technology." p. 14, GA7, p. 15.