

DRAFT

The Mutual Involvement of Modern Science and Modern Philosophy and Its Implications for Liberal Education by Michael Dink

I. The Philosophic Interpretation of Liberal Education, Socratically understood

In his magisterial historical study, *Orators and Philosophers*,¹ Bruce Kimball argues that the tradition of liberal education is not a unified one, but rather is divided into two opposing interpretations, that of the orators and that of the philosophers, each of which has prevailed in certain periods at the expense of the other. The oratorical interpretation, traceable to Isocrates, sees the goal as the development of virtuous and effective citizens, public servants, and even statesmen and the means as learning the arts of language, particularly of rhetoric, or persuasive speech. The philosophical interpretation, traceable, at least as an ideal, to Plato's dialogues, sees the goal as the pursuit of knowledge and the means as the learning of the arts of logic, mathematics and dialectic. Kimball argues that the so-called seven liberal arts of the trivium and quadrivium never formed a unitary program, but the primary, almost exclusive, focus was on rhetoric in one tradition and logic and mathematics in the other.

To put my cards on the table, I am an unabashed advocate of the philosophic interpretation of liberal education over the oratorical one, although I understand the true sense of that tradition somewhat differently than Kimball does.

My reasons for rejecting the oratorical tradition are all present, implicitly or explicitly, in Plato's *Gorgias* and never answered adequately by any of the advocates of that tradition. First, the proposed end is contingent and dubious. It is not clear, prior to some amount of inquiry, that citizenship is necessarily a good or the most important good for human beings. Second, it is not clear what the virtue of a good citizen consists in. An oratorical education must dogmatically presuppose answers to these questions, as Kimball acknowledges, since it does not engage in inquiry into them. Third, no argument is offered for the unlikely claim that mere training in persuasive speech constitutes an education in civic virtue. Fourth, it is not clear that there is a genuine art of persuasive speech.

If the philosophic interpretation of liberal education merely makes knowledge its goal, then it is to some degree open to analogous objections: 1) knowledge might be regarded as a contingent and dubious good; 2) it may not be clear what knowledge is or even if it exists; 3) however one might conduct a philosophic liberal education, it is not clear that it can lead to knowledge; 4) it is not clear that there is any learnable art or technique to philosophy.

Hence, if the philosophic interpretation of liberal education is not to fall prey to the same critique as the rhetorical interpretation, it must be based on a different understanding of the aim of a philosophical liberal education. I find such an understanding in certain aspects of Plato's presentation of Socrates.

¹ Kimball, Bruce. *Orators and Philosophers: A History of the Idea of Liberal Education*. New York, 1986.

Socrates supposes, correctly I believe, that all human beings care about guiding their lives by a correct understanding of their own good. More often than not, however, they act as if they had an adequate understanding of that good. When he questions them, however, they invariably show that they do not have such an understanding. He then asks them to join with him in a common inquiry in search of such a correct understanding.

This common inquiry into a correct understanding of one's own good is precisely what constitutes a genuine liberal education. It need not presuppose that knowledge is possible or good, only that the lack of an adequate understanding of our own good is not good. In his youth, Socrates famously cherished a hope that the teaching of Anaxagoras might reveal why it was best that everything was as it is. When that hope was disappointed, he turned away from the inquiry into nature to examine the truth of things in speeches.

In the *Apology*, we see at least one version of this inquiry through speeches, in which he takes upon himself, in response to an enigmatic reply from the Delphic oracle, the cross-examination of those who claim to know [about the human good]². This makes sense as a place to start in the inquiry into the correct understanding of one's own good.

This is precisely the basis of the form of liberal education that focuses on the reading of great books. Those great books are read because they put forward the most significant claims to know about the human good that are available to us. They are read because we want to understand and to evaluate their claims to know, so as either to find something that will contribute to the correct understanding of our own good or at least to have reasonable grounds for rejecting their claims.

The claims that they make are significant and worthy of examination for two reasons. First, the fact that they have been found worthy of reading and study by many people over a long time gives them a prima facie claim to be taken seriously as possible sources of wisdom. Second, the same fact also suggests, what further reading and reflection confirm, that they are the sources, acknowledged and unacknowledged, of many of our own beliefs about the human good, which need to be examined to determine how reliable they are. That examination is facilitated by tracing these beliefs to their sources, where they are often most powerfully and cogently articulated.

Thus, contrary to Kimball's claim, the reading of great books is not merely an accommodation of the "liberal free" ideal of critical thinking to the rhetorical tradition's interest in inherited texts, but is an intrinsic part of the Socratically understood philosophical interpretation of liberal education.

II. The Place of Modern Science in Liberal Education, in its Socratic interpretation

So far, it may seem that modern science would have no place in a liberal education Socratically understood. After all, the young Socrates, disappointed in Anaxagoras's failure to address the human

² This specification of the content of the claims to know is not made in the text of the *Apology*. Nonetheless, it is suggested both by Socrates' choice of those to be examined about their claims to know (politicians, poets, and craftsmen) and by his strenuous disavowal of any interest in "the things in the heavens and beneath the earth."

good, turned away from the inquiry into nature. In the *Apology*, the claims to know he examines are those of the politicians, poets, and craftsmen, not those who claim to have knowledge of nature or the cosmos.

Yet it is not clear from the text of the *Phaedo* that Socrates regarded his turn away from the inquiry into nature as final or definitive. Rather, he describes his turn to speeches as a “second sailing” in search of cause and compares it to studying something by examining its reflection rather than by looking at it directly.

Moreover, the desire to achieve a correct understanding of one’s own good inevitably leads to a concern with the distinction between knowledge and opinion and to the consideration of whether opinions about one’s own good can be replaced by knowledge. This concern in turn leads inevitably to a broader concern about the nature of knowledge and how it might be achieved. Hence any serious claim to knowledge, about any subject, becomes relevant to the Socratic inquiry into one’s own good.

In today’s world, moreover, it is modern science that makes the most prominent claim to know, so prominent that its very name is an appropriation to itself of the Latin word for knowledge, an appropriation which seems to mark an implicit claim to be the only legitimate kind of knowledge, a claim made explicit by many of its advocates.

One might object, however, that modern science does not claim to know about the human good, and thus does not belong in a liberal education conceived as an inquiry into the human good. To this, it must be replied that the claims to know of modern science are relevant to the inquiry into the human good in a number of ways. First, those who do interpret modern science as the only legitimate claim to know and as eschewing claims to know about the human good, thereby declare knowledge of the human good to be impossible. This is a claim highly relevant to the inquiry into the human good. Second, even if modern science is not interpreted as excluding other avenues to knowledge of the human good, it is nevertheless hard to deny that the claims it does make, under many interpretations, alter the landscape of that inquiry in fundamental ways, threatening to undermine appeals to, for example, the human soul, teleology, freedom, and human superiority to or even distinctiveness from other animals. Third, by its great success in increasing human power over nature, including perhaps even over human nature, modern science intensifies the urgency of the questions about what understanding of the human good can guide and restrain the use of that power.

III. Modern science requires interpretation

It has been a presupposition of my remarks so far that there is such a thing as “modern science,” which is significantly distinct from earlier forms of the inquiry into nature. This is a presupposition widely, but perhaps not universally, shared. It is shared both by those who think modern science has replaced the darkness of superstition and vain philosophy with the light of empirical reason and by those who think that modern science threatens to strip the world of any support for a meaningful human existence. An alternative is to see the inquiry into nature as a long standing human practice that has undergone continuous change and development in the course of human history with varying degrees, not necessarily monotonically increasing, of cognitive success. Attention to this diachronic continuity, however, should not induce us to neglect the question of synchronic discreteness. In other words, how discrete and distinct

is the thread identified as “the inquiry into nature” at any one time in relation to other inquiries, beliefs, and cultural practices?

There is a plausible case to be made, though no doubt not a definitive one, that the following cluster of ideas emerged roughly at the same time in the Greek speaking region of the eastern Mediterranean: the idea of demonstrative mathematics, the making of a clear distinction between nature and convention, as well as between knowledge and opinion, the attempt to gain knowledge of nature, and the quest for knowledge that comprehended both non-human nature and the human things, i.e., philosophy,. From this time forwards, there were debates about, and rival answers to the question, of how knowledge of nature might relate to other kinds of human knowledge, beliefs, political arrangements, and practices.

One set of answers, originally given by Aristotle, kept alive by Islamic and Jewish thinkers, and reconciled with their religious texts, traditions and practices in various ways, was reassimilated in the 12th and 13th centuries by Christian thinkers, who incorporated them into a theoretical synthesis with their religious beliefs. This scholastic synthesis contained a version of Aristotelian natural philosophy as the widely accepted framework for any ongoing inquiries into nature. No doubt, there were some practitioners of inquiry into nature who either ignored this framework or were beginning, more or less consciously, to chafe against and start to wriggle free of it.

Some thinkers, however, notably Descartes and Bacon, thought that radically new modes of pursuing the inquiry into nature were desirable, and that the old framework was, on many levels, an intolerable obstacle to the introduction and success of these new modes. They therefore undertook the task, correspondingly multi-layered, of articulating the new modes of inquiry, critiquing the old framework, providing a new framework, and persuading many different kinds of audiences of the feasibility and desirability of abandoning the old framework, permitting and even supporting the new modes of inquiry, and accepting the new framework.

It is, of course, a complex historical question as to what the actual effects of these efforts by Descartes and Bacon were, and to what extent the modes of inquiry now practiced by modern science were influenced by their proposed articulation, and to what extent the various competing frameworks by which we still seek to understand these modes of inquiry and how they fit into our lives, were influenced by the frameworks proposed by Descartes and Bacon.

While I am myself inclined to think that their influence in both respects is quite important, albeit not simply governing, the main point I want to insist upon is that the activity of inquiry into nature, in spite of, and perhaps to some degree because of, its tendency to claim to be comprehensive, has always stirred up questions about its proper place in relation to the rest of human activity, belief, and aspiration to know. In other words, modern science, no less, and perhaps more than its ancestors, stands in need of, and has had no lack of, interpretations, in which attempts are made to address the questions it provokes. A liberal arts study of the modern science version of the inquiry into nature must concern itself with these questions and with the interpretations that seek to answer them. To study modern science apart from them is no less fatally illiberal than the failure to study modern science at all.

IV. Some interpretative traditions in making philosophical sense of modern science

While I have acknowledged that there is room for doubt about the importance of Descartes and Bacon for the development of the practice of modern science, it seems to me that there is much less room for doubt about their importance for the tradition of the interpretation of modern science.

I would therefore like to sketch the roots in Descartes and Bacon of three strands of that interpretative tradition: epistemological, ontological, and political.

Embedded in the methodological account of the new modes of inquiry that they advocate are a number of epistemological claims. First, inquiry cannot begin from the everyday common sense interpretation of the world, and especially not from the Aristotelian philosophical codification/transformation (corruption?) of this interpretation. Some of the things that need to be rejected include: the reality of sensory qualities (color, warmth, hardness, softness, etc.), the articulation of objects into readily recognizable natural kinds, and as things with properties (explained as composites of matter and form), the explanatory priority of life to non-life, and the explanatory power of ends in relation to living things. Second, the form which knowledge must take is that of a law of action, and, in Descartes's case, a mathematical law of motion. Third, the method for arriving at these laws will be primarily experimental, that is, questions must be posed to nature such that experiments can be contrived whose observable results will answer the questions, negatively or positively. Fourth, there is some methodological divergence between Descartes and Bacon, the former asserting the possibility of deduction from self-evident principles down to a certain point after which experiments then become necessary, the latter insisting on extensive and methodical induction before any ascent to axioms is attempted.

The subsequent history of modern epistemology seems to flow primarily from this point of divergence, centering on the relative contribution of a priori, formal, deductive reason, on the one hand, and observation through the senses of experimental results, on the other. Emphasis on the former put one in the "rationalist" camp, on the latter, in the "empiricist." Kant made an attempt at a grand synthesis, attributing the possibility of coherent experience of a law-governed world, and hence of science itself, to a priori principles of the human understanding as the synthesizers of a manifold of sensory input under the a priori forms of space and time. Kant's grand synthesis was in part undermined by particular results of modern physics, i.e., challenges to causality and locality in quantum physics and challenges to the independence and uniformity of space and time in relativity.

This epistemological divide had an even more dramatic version on the ontological level, but not without the mediation of more particular Cartesian claims that went beyond the methodological ones cited above. From methodological skepticism about the categories and content of ordinary experience as the starting point of science, inevitably arise questions about the character of the objects known by modern science and the relationship of these objects to the objects of ordinary experience. Descartes' answer to this question was clearer, more radical, and more influential than Bacon's. In order to secure certainty and clarity for his new science, Descartes stipulated that its object must be that which we conceive clearly and distinctly about body, i.e., extension, figure and motion. This excluded from the object of Cartesian physics both soul and form, while reconceiving matter as nothing but extension. But since Cartesian science required a knower, as well as a known, he claimed to demonstrate the existence of a thinking substance, utterly distinct from body as extended substance. Descartes drew the explicit consequence that plants and animals, and humans insofar as their motions do not differ from animal motions, must be understood as machines, i.e., as complexes of matter in motion completely understandable on the basis of

the laws of motion. Meanwhile, the sensory perceptions that were formerly understood as receptions of form from external objects, resembling and hence conveying information about those objects, were reconceived as modes of the thinking subject, bearing no resemblance to external objects, and only problematically understandable as effects of those objects.

The ontological upshot was the separation of being into two self-contained and independent realms: one of bodies, as nothing but extended shapes, causing motion in one another according to certain laws, the other of “ideas” or “mental contents” which might also have causal relations among themselves. While Descartes himself proposed that there was interaction between these two realms at a single site within the human brain, most in the subsequent tradition abandoned this claim because of the great difficulties in giving an account of this alleged interaction. Those, like Hume, who followed Descartes in regarding the “ideas” as the source of all evidence, found, when thinking consistently, that it was impossible to make any inference beyond the realm of ideas to the existence of a realm of bodies. Taking this bull by the horns, Kant, Hegel, and Husserl all elaborated forms of “transcendental idealism” in which all knowing ultimately became a knowing, by a transcendental, or non-worldly, self, of a “world” constituted by itself.

The alternative path was to take some version of the Cartesian science of body as the starting point and to pursue the task of accounting for everything else as merely complicated consequences of the interactions of bodies moving according to the laws of motion, where everything else includes human behavior, consciousness, and knowing. This path can be called “materialist reductionism,” although the conception of what constitutes the “matter” to which everything is to be reduced, has been subject to constant revision due to developments within modern physics. There is even a question as to whether there remains any intelligible content to the notion of matter other than the object of the equations of physics. The advocates of “materialist reductionism” have included some philosophers, e.g., Hobbes, many practicing scientists, and many popularizing advocates of science.

Since it is hard for most of us, who are not bent on drawing out the logical consequences of *prima facie* untenable positions, to find any of these three alternatives (dualism, idealism, materialism) acceptable, many have turned to some version of what I would call an “anti-realist” solution. What these various versions have in common is an epistemological starting point that denies that it is possible, or perhaps even meaningful, for human beings to know “the way things are” or “what kinds of beings there are” or “what the world is really like.” One well-known advocate of the anti-realist standpoint, Richard Rorty, has famously debunked the realist tradition under the rubric: “Philosophy: the Mirror of Nature.”³

Here’s a rough catalogue of some of the more prominent forms of anti-realism.⁴ Logical positivism, a slightly cleaned up version of Hume, presumes that there are entities called “sense data” which are the only true “givens,” and that science simply consists in the development of procedures for reliably predicting which sense data will follow certain others. Instrumentalism is a more general version of this, one not committed to interpreting the field of prediction as consisting of sense data. Pragmatism

³ Rorty, Richard. *Philosophy and the Mirror of Nature*. Princeton, 1979.

⁴ I am indebted to the following book for assistance in articulating this catalogue. Laudan, Larry. *Science and Relativism: Some Key Controversies in the Philosophy of Science*. Chicago, 1990.

emphasizes that what is predicted is not just observational results, but results that matter for our practical lives. Wittgenstein offers a linguistic pragmatism, claiming that language, and hence any set of beliefs expressed in language, is meaningful only insofar as it functions as a practical tool. These positions restore a certain priority to the contents of ordinary experience, even though they differ as to the status of those contents.

For better or for worse, these anti-realist positions tend to weaken the claims of modern science to a special or unique authority. As a more effective tool for prediction, it stands on a continuum with other tools of prediction, such as ordinary non-methodical experience. It no longer has any critique to offer of other kinds of beliefs, except to point out that they offer less reliable predictions than science does. If there is to be such a critique, it must come from the anti-realist philosophers. To some it seems that the superior reliability of its predictive powers still gives modern science a stronger claim to the honorific name of “science,” albeit stripped of its former pretensions of incorrigibility and of ontological revelation. To others, however, this predictive power is a warrant of belief not radically different from other warrants, and that the inevitable consequence, again for better or for worse, of an anti-realist interpretation is a general relativism about claims for warranted belief. Richard Rorty is perhaps the most well-known thinker to allege this consequence.

Let us now return to the third interpretive strand: the consequences of modern science for moral and political questions. This has two “sub-strands”: the political conditions and consequences of the pursuit of modern science and the consequences of the content of modern science and its ontological interpretation for the content and status of moral beliefs.

Descartes and Bacon saw themselves as confronted with a situation in which political authority was connected with religious authority which was connected with theological beliefs which were connected with philosophical beliefs including beliefs about natural philosophy. They were thus understandably concerned with the consequences of seeking to promote new modes of inquiry which would require a change of prevailing beliefs about natural philosophy. These included the consequences for themselves and for others who might pursue the new modes of inquiry, as well as consequences for the stability and order of society, when beliefs understood to be foundational were questioned. They dealt with these concerns in a number of ways. First, to some extent, they attempted to conceal or to mitigate the tension between the new modes of inquiry and the current political and religious order. For example, in the *Discourse on Method*, Descartes claimed to be reforming only his own thoughts, he presented the world of his new physics as an imaginary one, and he claimed to provide proofs for the existence of God and the immortality of the soul on the basis of his new philosophy. Second, thinkers subsequent to Descartes and Bacon⁵, beginning at least with Spinoza, began to argue for the possibility and desirability of the separation of religious belief and political authority, and/or the separation of religious belief and natural philosophy. Hence new modes of natural philosophy would not be a threat to religious belief, or at least not to political authority. Third, an important feature of the new modes of inquiry advocated by Bacon and Descartes was the promise that they would confer on mankind new powers over nature for the benefit of mankind and the relief of his estate. This promise was offered as an incentive, not only to

⁵ Bacon himself had a somewhat different approach.

tolerate the new modes of inquiry, but to support them with funds and even, perhaps, institutions for education and research.

But this very promise of conferring on mankind greater power over nature made all the more urgent the question of how to arrive at an understanding of the human good that could regulate and guide the use of this power. While modern science's promise of increased power made this question more urgent, some of the interpretations of modern science seem to make the possibility of answering it more problematic. At the very least, the rejection of Aristotelian natural philosophy entailed the rejection of a kind of bridge, however shaky, between natural philosophy and moral philosophy. If man, like other natural beings, had a form or nature which determined the character of his activities and their excellence or perfection, then knowledge of this form or nature would provide a way of coming to know his good, understood as the excellence or perfection of his natural activities.

In addition, the reductionist materialist interpretation of modern science, if consistently adhered to, simply rules out any meaningful discussion of questions of the human good. To be sure, one might regard the bulk of modern moral and political philosophy as an attempt to avoid this consequence. Once again, it is Kant who gives a clear articulation of the dilemma and an impressive attempt at a solution. He sees the threatened incompatibility between the necessity and universality of causal connections demanded by science and the freedom to act one way or another required by human morality. His solution involves a sharp separation of both the self and the world into phenomenal and noumenal aspects, the former the realm of necessity, the latter the realm of moral freedom. Unfortunately the solution depends on a problematic interpretation of Kant's already problematic epistemology.

To the extent that the anti-realist interpretations of modern science weaken its epistemic distinctiveness and universalist pretensions, they might seem to open up a space in which to investigate questions concerning the human good. But insofar as the weakening of the epistemic claims of modern science tends towards a weakening and relativizing of all epistemic claims, the space opened up threatens to empty out of anything except the play of opinions.

This rough survey of the philosophic interpretations of modern science reflects my own opinion that, at present, none of the available interpretations is satisfactory. Hence, in my opinion, the quest for such a satisfactory interpretation remains one of the most urgent tasks of philosophy, and hence, one of the most urgent subjects for liberal education.