

# Nascent Cybernetics, Humanism, and Some Scientific Challenges

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## *Abstract*

*I argue in this paper that certain broad programmatic concerns offered by Norbert Wiener regarding the then-nascent field of cybernetics help us to see how the field has a certain kind of implicitly humanistic orientation. I take this orientation to be emergent or manifest in regard both to its interdisciplinarity and, in particular, to the way in which it highlights the need for not-just-scientific values to be at play in the evaluation and reception of its work. I marshal these points in response to some key recent varieties of scientism, namely those defended, respectively, by Alex Rosenberg and by James Ladyman, Don Ross, and David Spurrett, which have been philosophically resurgent of late. I contend that a humanistic approach to the sciences, following generally upon Wiener's cautionary points, escapes some obvious problems that ultimately beset varieties of scientism, particularly relating to the role that various values often play in and around scientific work.*

**Keywords:** *scientism, humanism, values, cybernetics, Norbert Wiener*

## **1. Introduction: Wiener's Warnings**

In the introduction to *Cybernetics*, which was written several years in the wake of the American bombings of Hiroshima and Nagasaki, Norbert Wiener expressly worries about the potential misuse of cybernetic technology. "We have contributed," he notes, "to the initiation of a new science which . . . embraces technical developments with great possibilities for good and for evil" (Wiener, 1948/1961, p. 28). He takes the good potential of the nascent field to be manifold and to include, for instance, promising interdisciplinary prospects in an increasingly over-specialized academic world, in addition to groundbreaking opportunities for human enhancement through, e.g., the development of more advanced prostheses (Wiener, 1948/1961, pp. 25ff.). He admits quite readily, though, that such prospects could easily be misused or overstep their anticipated bounds, as through the potential decimation of portions of the workforce through the mass introduction of more advanced robotic technologies (Wiener, 1948/1961, pp. 27–8). Ultimately, Wiener offers the following take in regard to how we might maximize such good potential while staving off the bad: "The answer, of course is to have a society based on

*human values* other than buying or selling. To arrive at this society, we need a good deal of planning and a good deal of struggle . . .” (Wiener, 1948/1961, p. 28, emphasis added).

I think that in Wiener’s basic reckoning with the prospects of the nascent field of cybernetics, there is a kind of simple acknowledgement of at least several key points pertaining, broadly, to science and society that are deeply instructive of the need for a kind of integrated *humanism* of the sort that is particularly resistant to varieties of *scientism*—which have, in certain cases, become philosophically resurgent of late.<sup>1</sup> I take the opportunity, then, to highlight some of these points and then draw attention to ways in which they protect against scientific ways of thinking that have been on display recently among certain philosophers—namely Alex Rosenberg, and also James Ladyman, Don Ross, and David Spurrett.

### 1.1 Varieties and Values

An initial concern that Wiener articulates in regard to cybernetics is the way in which the sciences have with time become more *specialized*. He notes, in a manner that would likely be increasingly resonant nowadays:

[S]cience has been increasingly the task of specialists, in fields which show a tendency to grow progressively narrower. Today there are few scholars who can call themselves mathematicians or physicists or biologists without restriction. A man may be a topologist or an acoustician or a coleopterist. He will be filled with the jargon of his field, and will know all its literature and all its ramifications, but, more frequently than not, he will regard the next subject as something belonging to his colleague three doors down the corridor, and will consider any interest in it on his own part as an unwarrantable breach of privacy (Wiener, 1948/1961, p. 2).

In his view, then, there is a certain uniquely promising potential to doing varieties of scientific work across (sub-)disciplinary *boundary* lines—in the case of cybernetics, perhaps especially between physics and biology, in attempts to study and chart the human body with particular reference to its nervous and various other control systems (cf. Majewski, 2018, pp. 60–1). Indeed, Wiener adds, “[i]t is these boundary regions of science which offer the richest opportunity to the qualified investigator (Wiener, 1948/1961, p. 2). What I want to note here is the way in which Wiener flags the value, in

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<sup>1</sup> For a recent summary of some extant humanistic responses to forms of scientism, see Stenmark (2018, pp. 73ff.)

particular, of an *integrated* and *unifying* approach that potentially characterizes the budding scientific field. I contend that this sort of emphasis, like various others to follow, is particularly a mark of a humanistic orientation.

A second—and arguably more important, for our present purposes—point which comes through especially in these passages is the way in which looming developments in cybernetics occasioned Wiener to be concerned about the maintenance and articulation of more *broadly human* values, to help *steer* and channel such developments. But notice how he is keen to characterize such values as *human* values. That is to say, in some basic sense, he takes such values not *just* or mainly to be culled from the sciences or discovered by them; instead, as he emphasizes, they are more broadly *human*—and so presumably, I argue, emergent within or characteristic of a *variety* of human pursuits and forms of inquiry, and not just the sciences.

It strikes me that both of these fundamental points, which Wiener highlights, draw attention to ways in which the sciences thrive within and depend upon a certain sort of cultural matrix—indeed, one that upholds and is animated by various central human values. The sciences are characteristically, in a word, component parts of a broader humanistic enterprise. It therefore follows, I contend, that varieties of scientism err inasmuch as they fail adequately to appreciate this sort of cultural placement and value-dependence of the sciences.

## **2. Scientism's Aspirations**

Prominent forms of scientism are often not articulated or defended as much by *scientists themselves* as they are by philosophers seeking to crystallize or defend in a principled manner what they take to be the scientific spirit (cf. Williamson, 2014, p. 31). To get a sense of a prominent, recent, “strong” sort of scientism, consider the following points from Alex Rosenberg: “Advocates of scientism like me . . . hold that science can answer all cognitively significant questions, and that such questions as it cannot answer are in one respect or another pseudo questions, based on mistaken presuppositions” (Rosenberg, 2018, p. 83). A question is “cognitively significant” for Rosenberg *only if* it is of the kind that can—at least in principle, eventually—be resolved by the sciences. He adds a caveat, as many other naturalistic or scientific thinkers do, about mathematics, which he takes to be, in a way, a most noteworthy and special kind of exception to this stated principle (Rosenberg, 2018, pp. 84ff.). But he takes it that a commitment to scientism bodes ill for many of the traditional or “big” questions of philosophy—pertaining to the existence of God, the question of personal identity through time, or the reality of free will—or at least that its means of resolving such questions will be unsatisfactory in

regard to the standards, often drawn from “common sense and received philosophy,” that we tend to have for them (Rosenberg, 2018, pp. 83–4; Rosenberg, 2011, pp. 2ff.). He spells out his broader line of thought in greater detail, in a way relevant for our purposes here, thus:

For scientism most of metaphysics is easy. Almost all of it can pretty much be read off of science: Reality is fermions and boson and the aggregation of them governed by the laws of physics. The physical facts fix all other facts . . . The biological facts—including especially the appearance of a “means/end” economy in nature will be explained as purely Darwinian processes driven by the second law of thermodynamics. . . . It will also follow from the fact fixing of physics that there is no free will or for that matter a self, soul, or person, which endures numerically but immaterially . . . (Rosenberg, 2018, pp. 84–5).

There is a risk to taking Rosenberg’s views as exemplary or representative. For as Johan Hietanen et al. note, Rosenberg might well be the *lone* prominent defender of, as they call it, the sort of “narrow-strong” scientism according to which *only* the sciences (and in reality physics) count as reliable means of attaining knowledge (Hietanen et al., 2020, p. 526). But as regards the specific matter herein under consideration, his views might in fact be more representative than uniquely extreme. Hietanen et al. claim, too, that Peter Atkins does not advocate for a strong-narrow version of scientism, but instead, as they term it, a “narrow-weak” one, according to which the sciences are not the *only* reliable means or procedures for “exposing fundamental truths about the world,” but just the *best* (Atkins, 1995, p. 97; Hietanen et al., 2020, pp. 524ff.).

Atkins, though, has defended a view very much like Rosenberg’s, at least on the matter of the cognitive significance of various “big questions.” He draws the contrast between “big questions” for which relevant evidence can be marshaled, e.g. regarding the age or fundamental structure of the universe, or the nature of consciousness. Questions such as these, Atkins contends, are characteristically amenable to “scientific elucidation.” He contrasts such empirically accessible questions with what he takes to those marked by “unwarranted extrapolations of human experience.” These include, e.g., questions about the purpose of the human race or the nature of the soul; and they are, for him, typically reckoned with by “wish-fulfilling speculation and the stimulation provided by the study of sacred texts” (Atkins, 2018). He also contrasts science and religion along similar lines, contending that the former—which he brands “the only path to understanding”—contends meticulously for objective, experimental analyses of the fundamental structure of the universe and its constituents, whereas the latter contents itself with introspection, incomprehensible explanations, and, in a

word, sentimentality (Atkins, 2006, pp. 124–5). (These considerations cast doubt upon the contention of Hietanen et al. that Atkins’s position is so easily distinguishable, as a more mitigated form of scientism, from Rosenberg’s.)

We have good reason, I believe, to disagree with both Rosenberg and Atkins regarding such a dichotomy pertaining to cognitively (and so, for them, *scientifically*) significant questions, and we need to look no further than the sorts of considerations that are adduced by Wiener—namely, those pertaining to the *human* values and interests that are pertinent to and lively in and around scientific research. To begin, consider a rather basic example to this effect. Should the federal government of the United States continue to *fund* scientific research and development the way that it does? This is the sort of question that many scientists and benefactors of the sciences care about deeply; but it is also a question that, fundamentally, is not *simply* (or largely) amenable to a scientific answer. Instead, it calls much more for some sort of a principled and pragmatic *political* answer than it does a properly scientific one. To answer it, one would likely need to adduce considerations pertaining to what the federal government *should* care about, and to what degree; and doing this would likely lead one back to something like its founding principles or documents, say, or the charters of the specific governmental bodies under consideration—which would explicitly gesture at or circumscribe concerns such as these.<sup>2</sup> The pressing concern that accompanies an example like this, particularly for Rosenberg and Atkins, is: Are questions like *these*—about how much, and to what degree financially, we should *care* about the sciences and their support—in fact cognitively or scientifically significant on their views? For data *can* be adduced to reckon in various ways with such questions; but it also seems that, at the end of the day, something like critical social values will carry much *more* weight in such deliberations—like concerns for bolstering the pursuit of truth, free inquiry, or ongoing exploration and its technological payoffs.

In a related vein, consider an example like the ongoing development of brain-computer interface (BCI) technology. It seems that many would have the same sort of attitude toward it more generally that Wiener has toward the nascent field of cybernetics: one of a kind of guarded optimism. In other words, many would see the ongoing developments in this field as variously intriguing, hopeful, or promising; but also too, perhaps, as potentially ushering in unwanted dangers, risks, or challenges. Indeed, a good many people might think that a certain degree of BCI (or BCI *in general*) could be *detrimental* to us, even though it might offer some obvious apparent technical payoffs. It is not

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<sup>2</sup> Now, typically such funding of course just *continues* as part of governmental inertia. But if one were to ask this sort of question in a more halting, paradigm-shifting manner, these sorts of considerations would likely be the most apt or important.

at all clear, though, that doing any kind or degree of scientific labor could help to settle *these* sorts of disputes (to the extent that they can be settled at all).

Scientific work could tell us, say, that BCI technology could enhance the functioning of some part or system of the human body, but it could not tell us whether we ought to *want* such enhancements or find them *desirable*. This is not to say, of course, that the invocation of broader *human* values *just could* resolve such disputes. But it is to say that the normally satisfactory manner of approaching such questions is *precisely* by way of invoking such values. These might include having a keen concern, say, for the *autonomy* of human agents, which could be affected adversely by such technology. The kinds of considerations that end up winning the day in response to such questions are not—or at least we tend to think they *ought not* to be, in principle—considerations just or mainly drawn from the relevant sciences (or technology) but instead from a broader *normative* sense of the value and identity of human beings—say as having some sort of particular dignity or personal status that should not be transgressed.

Consider the second main example from Wiener in similar fashion. Scientific work, bearing various fruits in technology, might no doubt help us to engineer better, more sophisticated, or more competent robotic laborers; but again, it is ultimately beyond the pale of the sciences to tell us whether it would be *good* or *wise* to phase out human laborers, on a broader scale or *en masse*, by means of such simulacra. Indeed, such debates are currently happening with vigor. Various technologies have made it workable (or very nearly so) to achieve these sorts of results. But to this kind of point, I think Wiener is quite right: We need some sort of broader scheme or framework of *human* values to help us consider such questions and (attempt to) adjudicate them aptly. This is not, of course, to claim that there *just is* one such framework; but it is to say that advertence to something like this becomes needful fairly quickly in regard to such questions and concerns.

Consider a final example that perhaps highlights these points even further: climate science. A great deal of recent climate science shows us that global warming is and has been happening, especially over the past century or two, and that human activity, especially through the consumption of fossil fuels, has been a chief catalyst of these trends. One thing that climate science *itself* cannot tell or reveal to us, however, is whether it is *bad*, say, that these trends are in fact afoot. Most people take it for granted that this state of affairs *is* bad or lamentable, but this judgment itself is not derived from the sciences—but instead from a sort of basic human reflection on duties we have to the planet, say, or to future generations; or from religious sensibilities about how we ought to care for creation. (One might just contend, of course, that such a state of

affairs is somehow *obviously* bad, without advertence to anything further; but claiming this, too, would not be a scientific claim but instead something purportedly apparent, say, to anyone with normal and healthy cognitive capacities.) At any rate, the question of *whether* or *how much* we should care about the planet and its future is not obviously (or even in principle) a scientific one. Instead, it is *humane*, or more broadly human, in the way that I have been describing, and so calls for a sort of integration of a scientific perspective with insights drawn from other (non- or extra-scientific) domains or ways of thinking.

I take it that these sorts of examples all potentially pose issues for the kind of scientific view espoused by Rosenberg or Atkins. For in all three cases, there are important, decisive, deep questions at play; but also in all three, the sciences themselves seem unable to offer the kinds of answers we would typically seek to them. (Now, one might of course just claim that we tend to seek the *wrong* kinds of answers to such questions; but this retort would, to most, hardly seem satisfactory.) That is, in all three cases the relevant sciences and their results seem to interact quite gracefully with other not-just-scientific values or concerns that pertain more broadly, say, to our societies and the things that we care about or prioritize within them. A humanistic approach of the sort I am advocating would readily *expect* this sort of interaction—the general sort commended by Wiener—whereas a scientific one lacks the sort of integrated framework within which to reckon with it more deeply.

### **3. Humanism, Values, and Practices**

Acknowledging these concerns, following Wiener, in a certain way helps to stave off straightaway a sort of neo-positivist tendency to conceive of the sciences as not susceptible to or needful of various *value* considerations in the way that other domains are. If we are honest, though, at the very least, scientific projects demand fundamental value judgments in regard to, among other things, *which* problems or questions are undertaken and pursued and to what *use* the results are put, e.g. on behalf of technological work (Machamer and Wolters, 2004, p. 1). But there is a deeper concern at play on this front, and this is the way in which values that are not peculiarly scientific seem quite crucially to play roles in scientific work itself, particularly in regard to theory choice and evaluation. Hilary Putnam has recently drawn attention to this point, drawing upon Dewey:

I remember seeing a letter somewhere in which Dewey wrote that far from being just one special corner of experience, value is something that has to do with all of experience. In the philosophy of science, what this

point of view implies is that value judgments are essential to the practice of science itself. Here I do not refer only to the kind of value judgments that we call “moral” or “ethical”: judgments of “coherence,” “plausibility,” “reasonableness,” “simplicity,” of what Dirac famously called the “beauty” of a hypothesis, are all value judgments in Charles Peirce’s sense, judgments of what he called the “admirable” in the way of (scientific) conduct (Putnam, 2002, p. 135).

Putnam is flagging what he takes to be an occasional conceit of philosophers of science: namely, an “evasion” of the significance of such values in the work they study and philosophize over. He stresses not just questions of (technological and other) *application*, however, and the way that such values factor into various ancillary labors. He also emphasizes the values that are quite crucially implicated *within* the work of the sciences themselves. What we might of course note about such values is that they are typically not *peculiarly* scientific. One might argue that they are *paradigmatically* so; but to say that they are *just* scientific (or even mainly so) would be wrongheaded. After all, narratives are coherent, in addition to theories; and hunches about ordinary matters are more or less reasonable or plausible, as hypotheses are.<sup>3</sup>

Putnam’s Deweyan reflection helps us to see that the significance of such values, and the way they factor into our experience and reflection on it, is not *just* or mainly something scientific—but again, we might say, something just more broadly *human*. A humanistic thinker can, I take it, appreciate this point much more easily than a scientific one, because the former acknowledges that science, like a variety of other pursuits, is crucially something *we do*. Accordingly, he should be unsurprised that values that matter in the sciences matter alike in other domains, and vice versa. A humanistic thinker takes the sciences to be social or cultural *practices*, in the way that the arts are, or perhaps also religions.<sup>4</sup> Notice that claiming something like this need not be injurious to the special character or esteemed history of the sciences. What it does do, though, is guard against undue (philosophical and other) *idealizations* of them that would, say, render them inappropriately *unlike* other such practices.

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<sup>3</sup> An interesting and perhaps controversial aside here might be the way in which simplicity, in particular, seems to have sprung—chiefly by way of Ockham—from the scholastic theological tradition, which would no doubt have taken *it* to matter as a value in relation to divine aseity—that is, in regard to the way in which it is somehow reflective of God’s own (uniquely simple) character. As a truth-tracking mark or value, that is, it is historically not *just* of scientific merit or weight, but instead bears a squarely theological stamp as regards its pedigree.

<sup>4</sup> For two important loci regarding these notions, see MacIntyre (1981/2014, pp. 175–81) and Carroll (2003, pp. 63–75). Mikael Stenmark (2010, p. 292) thinks that the most sensible and equitable way of comparatively treating science and religion is to stress, above all else, that they are social practices.

Consider Rosenberg's (and Atkins's) scientism once more and particularly his claim that the sciences can answer *all* cognitively significant questions (cf. Ladyman, Ross, and Spurrett, 2007, p. 30). In regard to such foregoing (scientific and other) values, in particular, this sort of claim simply seems mistaken. It is not the case that the sciences *themselves* can tell us, e.g., about why coherence is a virtue and ought to matter to us. Philosophical reflection *upon* the sciences and their methods and fruits might yield such a sense of things; but it is not the case that *doing* any particular science itself could. Claiming as much is not an affront to the sciences either. In a certain sense—we might say with Wiener—quite the contrary: Acknowledging that the sciences employ and uniquely make use of such values guards against attempts to idealize them into something they are not, or to make them do more theoretical or conceptual work than is necessary, appropriate, or even possible.

Recall the contrast from Hietanen et al., along with Moti Mizrahi, that a *weak* form of scientism, in contrast to Rosenberg's strong variety, is rather more defensible and so should be co-opted by those who want to take up the scientific mantle. Again, in a word, weak scientism contends that the sciences are our *best* means of knowing about the world and reality, if not our *only* means (Mizrahi, 2017, pp. 354ff.). To the point at hand, Mizrahi notes that weak scientism is quite apt to welcome the role of various values in scientific research and inquiry and that it need not avoid them or gesture at a sort of unrealistically value-free conception of the sciences (Mizrahi, 2017, p. 363).

I wonder, though, whether such a qualification to the scientific outlook genuinely helps it against the kinds of considerations I have been raising. For weak scientism, while not inclined toward *jettisoning* other possible ways of knowing, *leads* with the claim that the sciences simply *are* our best ways of knowing. The trouble with this sort of approach, still, is that it offers very little in regard to a framework within which to integrate the work of the sciences with other pursuits and forms of inquiry. And this sort of concern is eminent among those that have been raised in regard to varieties of scientism—namely, that they, as Tom Sorell notes, put “too high a value on science in comparison with other branches of learning or culture” (Sorell, 1991, p. x). Simply claiming that the sciences are our best, if not our only, means of knowing about the world and reality does not really give us much of a yardstick for evaluating the (de)merits of other potential approaches, save by noting how *scientific* they are (not). James Ladyman, among others, assures us that a commitment to scientism need not involve a denigration of the arts and humanities; but he also offers very little as to how a scientific stance might in fact *value* such domains, other than allowing them to be enriched and clarified by the sciences (Ladyman, 2018, p. 108). And this sort of approach, to which even weak

scientism would seem to lend itself, can easily lead to troublesome results. Susan Haack notes this danger: That when “scientific” becomes a kind of sanctifying honorific term, it is not uncommon to see various fields and claims—in advertising, certain disciplinary studies, legal arguments, and so on—grasp for it, in a way that ultimately ends up diluting the commendation and its significance. Some such things might be better off *not* trying to be (more) scientific; but displaying this sort of resignation can be challenging when the sciences *are* our sole or preeminent metric of epistemic fortitude (Haack, 2017, pp. 43–4).

A humanistic approach is not consigned, in contrast, simply to trumpeting the singular merits of the sciences vis-à-vis other purported ways of knowing or approaching reality. It can no doubt afford the sciences a peculiar place on account of their uniquely robust epistemic successes; but it also would readily insist that they be seen and placed within a broader matrix of human pursuits and concerns. We might note historically, to this effect, the way in which Renaissance humanists were particularly wary of the tendency toward allowing any particular metaphysical or scientific framework to become too ahistorically monolithic in regard to our approach to life, culture, or various institutions (cf., e.g., Cooper, 2002, p. 139). Such wariness might in part be construed as a caution about allowing some or other dimension of the broadly humanistic enterprise—which traditionally includes the sciences, arts, and various other human practices and pursuits—unjustly to eclipse or colonize others and thereby become too hegemonic.

More recently, another way in which such a humanistic intuition is borne out, in my view, is by considering, as some scientific thinkers have particularly done, the *institutional* settings in which the sciences are typically pursued. Ladyman, Ross, and Spurrett, whose approach to scientism is more restrained than Rosenberg’s, defend a form of scientism that locates the sciences specifically through their peculiar *institutional* features—rather than, say, through *a priori* or conceptual distinctions. For them:

[S]cience is . . . demarcated from non-science solely by institutional norms: requirements for rigorous peer review before claims may be deposited in ‘serious’ registers of scientific belief, requirements governing representational rigour with respect to both theoretical claims and accounts of observations and experiments, and so on (Ladyman, Ross, and Spurrett, 2007, p. 28).

One might wonder, though, whether framing matters thus actually does all that much to set the sciences apart or demarcate them, at least from domains that scientific thinkers typically would like to. Think, for instance, about *religions*,

which for many such thinkers might be a kind of institutional foil to the sciences. A difficulty emerges inasmuch as many religions abide by procedural and institutional norms often decidedly *similar* to those of the sciences, in how they develop their teaching and carry on their affairs—at least if we go by the express standards of Ladyman, Ross, and Spurrett. Think, on this front, about the sort of “peer review” that went in various ways into the formation and conciliar codification of the New Testament canon: It surely was rigorous, and though it was perhaps not “testable” in the ways matters scientific typically are, it still involved rigorous tests *of a sort*—like whether and how much, say, some potential book of scripture had been employed in popular devotion and liturgical prayer. It might become hard to see, in other words, how institutional standards like *these* would separate out the sciences from, say, certain important historical religious traditions like Christianity.

Another important institutional point is of note here, I think, and it is perhaps the more relevant concern for our present purposes. Scientistic thinkers have trouble, in my view, reckoning with the significance of the institutions that are paradigmatically home to the sciences and their development. Take universities, for example, which are characteristically products of the medieval Muslim and Christian worlds. Universities are *the* most characteristic hubs of scientific inquiry, research, and development, and they have been for centuries. But universities *themselves* are not, as it were, products of the sciences. To the contrary, they are something more like products of a certain traditional sort of *culture* that had, to be sure, a great esteem and pride of place for the sciences and their development, but also for many other forms of inquiry and pursuits that were taken to be part and parcel of a greater humanistic enterprise. Ladyman, Ross, and Spurrett, tell us about, for instance, how we are evolutionarily well-suited to do science as we do, and this point is well taken. But claiming something like this does not tell us much as to why our particular *venues* of scientific activity and work ought to be of especial significance. A humanistic thinker, on the other hand, can reckon quite well with an institution like the university and its heritage, for he acknowledges straightaway that the sciences, like other social or cultural practices, are carried out and *housed*, so to speak, within a broader cultural and institutional matrix that is nourished and sustained by various *humane* concerns and ideals—like, e.g., the good of seeking knowledge and understanding.

A scientistic thinker might retort and claim that universities are only *contingently* important in the development of the sciences, such that the cultural settings in which they are characteristically undertaken are not as important as, say, the humanist would have them be. This point is unconvincing, though: For one might wonder seriously whether the sciences *would be* nearly as important as they are and have been historically *were it not* for such centrally placed

cultural bulwarks like universities, which have cultivated and sustained them, and have taught and imparted them in various ways to subsequent generations, particularly to those in positions of authority, who often steer and codify the broader concerns and public values of their societies.

#### 4. Conclusion

I have argued that Wiener's pioneering programmatic concerns for the nascent field of cybernetics highlight for us the need for *human* concerns and values to be of central standing as we do scientific work and consider its place in society. I have argued, too, that a humanistic approach to such matters—especially to the priority of various values in and around scientific labor and to the institutional structures that sustain and perpetuate the sciences—deals much more ably with these concerns, and the various roles of these values, than does a scientific one, as recently defended, respectively, by Rosenberg and Ladyman, Ross, and Spurrett.

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