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RESEARCH ARTICLE

Empirical Technoscience Studies in a Comtean World: Too Much Concreteness?

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Abstract No one doubts the radically transformative power of contemporary technologies and technoscientific practices over the material dimensions of our experience. Yet with the coming of all the exciting changes and the promise of ever better material conditions, what kinds of lives are we implicitly being encouraged to live? One would think that current philosophical studies of technology would make this a central question, and indeed, a few have done so. But many do not. Following the lead of thinkers who have made the so-called "empirical turn," many demur, usually with some remarks about the question being too abstract and general—too likely to suck us into utopian or dystopian speculations—when what is called for are truly informative and "concrete" studies of what it is like to be with actual technologies. My paper considers the good life question—and the philosophical price one pays for not asking it—in light of Auguste Comte's theory of the three stages of intellectual development. Comte's depiction of the third, positive scientific stage is much less dated than one might assume. In fact, it is useful to think of our own era as arriving with a Comtean story attached, that is, a story of life in the "developed" world becoming ever better thanks to modern science and technology. Because this story now seems less deserving of the unqualified optimism Comte had about it, I argue that thinking of our own experience as permeated by Comte's conception of third-stage life gives us a fresh way to consider our misgivings about this default position without either lapsing into utopian or dystopian speculation, or confining one's focus to purely postphenomenological or pragmatic studies of technoscientific life as it now "appears."

Keywords Technoscience · Technological life · Philosophy of technology · Auguste Comte · Feenberg · Ihde

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1 Introduction

All philosophers of technology are, of course, interested in the radically transformative social, cultural, and political power of technology and the technologized sciences. It just is the case that biotechnology, nanotechnology, IT, AI, and numerous other kinds of contemporary practice are dramatically changing the material conditions of our experience. But along with these material changes, what kinds of lives are we implicitly being encouraged to live? What sense of the good life do these changes already convey to us, even before we have a chance to think about it? Often this question does not get asked until the discussion of our relations with various specific technologies is well under way. After all, this is what the "empirical turn" in technology studies, mirroring the general pragmatism of the present age itself, tells us to do.[1] Advocates of such a turn are never very clear about what "empirical" rules in—though it is certainly more than any follower of Hume would—but they are very clear about what it leaves out. Any talk about Technology *Überhaupt* will either take us back to the bad old days of metaphysical pronouncements about unchanging essences, moral and political absolutes, and experience-ignoring accounts of what is "really" going on, or force us to listen to social scientific explanations about how things got this way and, barring new "conditions," must therefore continue this way. And if these prospects are not bad enough, then the sheer and insistent presence of, say, information or enhancement technologies should divert us toward more immediate and pressing practical problems. Who has time for general discussions of life in a technological world, when someone is working to produce designer children or harvesting information from your computer? Nevertheless, it is the good life question I want to consider here, and I approach it in light of the largely forgotten philosophy of Auguste Comte. I intend to show that the question is none of the things the new empiricists fear it is, and that Comte's way of answering it is actually still with us.

I want to show that reaching back to the teachings of the original positivist is less of a stretch than it might appear, for when it comes to understanding the general sense of what it is like to live in a technoscientific era, Comte remains relevant today, not just as a historian's topic but as an inheritance. Researching what Comte says may be interesting, but critical reflection on what we still get from him can change how we philosophize. We always arrive in the present as having-been, says Nietzsche—which means being both "burdened" by history and equipped with the "unhistorical" power of present experience to transform it. Of course, because Comte painted his picture of technoscientific life in mid-1800s terms, it is mostly a projection of things to come, which made it easy for him to picture a science-shaped and technologically-realized future that is not burdensome at all. For us by contrast, living in a technoscientifically-realized world that Comte could only project, the present and likely future appears more Janus-faced. One face still smiles with unlimited promise, as it did for Comte; but the other face frowns with discomforting, perhaps even dehumanizing and dystopian implications. At the very moment when it seems to promise virtually endless good, the modern marriage of science and

[1] On the empirical turn, see Achterhuis (2001) and Olsen, et al. (2009); on pragmatism and the philosophy of technology, see Pitt (2011) and Hickman (2001).

technology confronts us—burdens us—with prospects that seem threatening and destructive. No matter how upbeat we may often be about a world known by science and a life lived through ever better technological mediation, the nineteenth century optimism of the classical positivists can seem remote indeed.

But is it? We should not be fooled into thinking we are all post-positivists, simply because we reject twentieth century logical empiricism and acknowledge that the experience of technoscientific life is a more mixed blessing than Comte expected. The very idea of being "post-positivist" can tempt us—as it tempted Mumford, Ellul, Ortega y Gasset, Jonas, and others—into expressing their misgivings about modern life in dystopian terms, and as it thereafter tempted still others—pragmatists and postphenomenologists among them—to reject all negative discourse about technology "in general" and confine themselves to concrete study of real-world experience with various actual technologies. Yet advertising a position as post-positivist does not make it so. For one thing, it presupposes the traditional distinction between abstract/general and concrete/specific perspectives, along with the corollary that we can choose between them. In what follows, I appeal to Comte to explain why we should avoid this whole line of reasoning. Comte's understanding of the "law" of three stages of intellectual development—and more importantly, our inheritance of it—is not abstract rather than concrete, and although it envisages global progress it is not utopian and thus does not require any dystopian rejoinders. I will suggest that we have not left Comte's understanding behind, because one cannot leave an inheritance behind—that is, oppose it and imagine turning one's back on it. Hence, we must try instead to critically reflect on it—here, specifically, reflect on what our dissatisfactions with a happy Comtean portrait of technoscientific life amount to, in a world in which there is no turning back and in which living such a life is no longer optional.

2 Contemporary Technoscientific Life as a Mixed Blessing

So, I start from the idea that life with ever better technologies is Janus-faced. At least in the so-called developed world of North America and Western Europe, anyone still enthusiastically Comtean must strike us as either hopelessly naïve, ideologically blinded…or perhaps an industry lobbyist. The emerging, exciting, but increasingly problematic, double-sided character of technoscientific life is impossible to miss—and also impossible to avoid. Standing back from it, evaluating it all as if from nowhere—this dream is over, exposed as the myth of objectivism. We are left, body and soul, within this life. And as we live through it, even on our best days and mediated by the best technologies, it is surely also true that our societies

> are fraught with meaninglessness, manipulation, and rationalized violence. Dystopia and apocalypse beckon as surveillance and nuclear technologies advance. Climate change melts the poles while nations dither. The long-run survival of modern society is very much in doubt. Could it be that our technology, or at least the specific way in which we are technological, threatens us with early self-destruction? (Feenberg 2010, 186)

I deliberately cite here someone who is famously both a radical critic of current technological life and an opponent of dystopian accounts of it. I note that for Feenberg, it is perfectly possible to face the dark and fundamentally undemocratic character of technoscientific life squarely and in general terms, and yet insist that its "democratic rationalization" must be worked out entirely from within the experience of undemocratically darkened life and in a way that tends to specific cases. In other words, Feenberg is one of the philosophers of technology who has not been scared away from talking about what used to be called the spirit of the age by those who see themselves as being on the side of the angels for having chosen an empirical and/or pragmatist turn away from such talk.

No argument can dissuade a willfully dedicated student of the concrete from lumping views like Feenberg's together with blanket condemnations of modern life like those of Ellul, Mumford, or (the metaphysical fiction called) Heidegger. Yet for those less dedicated, it is easy to see that Feenberg's generalizations are not generalizations in the traditional sense, that is, conceptual schemes abstracted from life, formed in purely theoretical terms, and then flung back over individual phenomena in a uniform way (as, e.g., when "essences" allegedly tell us what sort of thing this individual is, thus making further attention to this individual itself unnecessary for anyone interested in "knowing" it).[2] To be sure, philosophers like Feenberg do characterize technoscientific life in a "general" way, but they do so from within the experience of living through a life in which technology is everywhere in order to identify the pervasive sort of meaningfulness that, whatever we may say about any particular technologies, seems somehow to permeate them all.[3] Rejecting generalization of this sort for being abstract is a little like rejecting the characterization of a crowd as being in an angry mood because it is not a concrete statement about the anger of any of its individual members. Hence, when Feenberg says there is a "specific [and undemocratic] way in which we

[2] As Thomson explains, more or less with Feenberg's consent, Feenberg's anti-essentialism is complex and focused mainly against Heidegger, whom he sees as making metaphysical generalizations about technology that attribute to it timeless essences, with "substantive" power over particular technologies that operates outside the possibility of human intervention, and thus forces us to think of all technologies "one-dimensionally," as having the same necessary failings and thus deserving the same condemnation (Thomson 2005, 47–52). I agree with Thomson that Feenberg is wrong about Heidegger, but the point here is that none of these criticisms apply to Feenberg's own critique of the predominantly undemocratic spirit of technological life. Indeed, he thinks Heidegger is largely right about present conditions and if his critique were de-metaphysicalized, the resulting idea, viz., that "Heideggerian essences are historical and dynamic is one that I would like to defend too on somewhat different grounds" (Feenberg 2006, 194).

[3] Feenberg uses "meaningful" in a narrower sense than I do here. For him, technologies have both functionality (i.e., they are designed for something) and meaning (i.e., in the sense that their realization in a world of interests and beliefs may or may not have much to do with the original design) (Feenberg 2010, 174–78; Feenberg 1999, 202–207; also generally, Veak 2006). In any case, no rational criterion of functionality (e.g., efficiency) is ever enough to *determine* the meaning of a technology; rather, meaning "ultimately depends…on the 'fit' between devices and the interests and beliefs of the various social groups that influence the design process" (Feenberg 1999, 79). Regarding others who "generalize" like Feenberg, I would certainly add, e.g., Mitcham, who develops "historicophilosophical descriptions" of three ways of being-with technology "adapted" from Heidegger's *Being and Time* (Mitcham 1994, 275–99, 277); Latour, who says our way of existing has never been "modern" (Latour 1993) and attempts to develop a sociology of "assemblages" (Latour 2005); Foucault, who distinguishes between "local inquiries that…risk letting ourselves be determined by more general structures of which we may well not be conscious" and his own historico-critical "ontology of ourselves," which aspires to be at once both "the historical analysis of the limits that are imposed on us and an experiment with the possibility of going beyond them" (Rabinow 1984, 47, 49–50); and of course, Heideggerians like Thomson (2009), 146–66.

are technological," although he understands himself to be saying something "essential," it is not essential in the sense that this way cannot be changed or that every technological phenomenon possesses some permanent and unfortunate property. He means a fundamentally undemocratic atmosphere currently, hegemonically, and unsatisfactorily infects pretty much everything we say and do, and calls for "radical technical as well as political change" (Feenberg 2010, 6).

Of course, one might argue that being with technologies in the developed world in the twenty-first century is not so undemocratic or that some other pervasive feature of this way of being figures more prominently than the one Feenberg singles out, but at least these would be quarrels about the same thing, namely, the general atmosphere of twenty-first century technoscientific life. And indeed, some have argued that ethnicity, gender, an arrogant attitude toward nature, or even the sheer presence of ubiquitous technologies itself figures in the unspecific "way we are technological" just as much as if not more than the political features Feenberg singles out. For example, in the European Commission research report, *Converging Technologies: Shaping the Future of European Societies* (Nordmann et al. 2004), its authors praise the wonderfully transformative character of today's technologies, but immediately add this cautionary note: "[I]f these…technologies created controversy and anxiety each on their own, their convergence poses a major [new] challenge not only to the research community, but from the very beginning also to policy makers and European societies" (Nordmann et al. 2004, 2). The sheer fact—the global happening—of this convergence is certainly not itself a technological thing, but "it" raises issues—and alters our way of being technological—that individual technologies, taken one by one or group by group, do not. Indeed, this seems so important to the report's authors that they insist it should be addressed before tackling any specific practical problems. Like Feenberg's worries about the undemocratic cast of present technoscientific life, their worries about technological convergence—as something that permeates the whole of contemporary technoscientific life, informing how this life is lived even while remaining invisible in the midst of our designing and using ever more converging technologies—is given philosophical priority. Of course also like Feenberg, they take for granted that this just is how things are going, and they start by recognizing all the good in this process—not just in controlling the physical environment, but in improving the quality of human life. Only then do they do they turn to critical issues and settle on the problem of "agenda-setting."[4] When all the individual technologies with their separate agendas

[4] The report identifies four issues—first, "embeddedness," by which they mean that since converging technologies tend to form a complex and invisible infrastructure for human actions, the very existence of this infrastructure makes it difficult to see how it affects the basic character of the actions themselves; second, "unlimited reach," the idea being that hoping every problem has a technological fix can make us complacent and excessively optimistic (e.g., why push for clean water if water treatment plants can always be improved?); third, a tendency to transform the idea of "engineering *for* the mind and body" into the much more reductive idea of the "engineering *of* the mind and body" (e.g., think of the engineering fantasies of strong AI, or the slipperiness of the idea of human "enhancement"); and fourth, proliferation of so many specifically targeted technological successes, in the aggregate, often produces more generally problematic social results (as, e.g., when medicine increases longevity to the point of overwhelming the welfare system, or increased economic efficiency causes greater unemployment and a general de-skilling of the workplace). In the end, the authors are willing to assume (!) that current technologies taken one at a time might, in the main, be driven by benevolent agendas, in order to highlight more forcefully how, when individual technologies converge, they do in fact collectively and more radically "pose threats to culture and tradition, to human integrity and autonomy, perhaps to political and economic stability" (3).

begin to converge, how will these agendas be reset and co-coordinated and by whom? About this question, they note a very loud silence—one typically associated with a default answer provided by whoever and whatever represents the strongest socio-economic forces.[5] Finally, and again like Feenberg, the report's authors argue that to effectively raise their issue, one must see that one's own reflective evaluation of technoscientific practices, whether as social scientist or philosopher, is just as sociopolitically embedded and embodied as the practices themselves. Only then can one ask in an experientially significant way what general effects of convergence permeate all of modern life. And given these effects, is it really self-evident that technoscientific life should be encouraged without limits in the first place?

Of course, taken one way, this is a dumb question. What could it even mean to consider remaking the world so that it is not so technoscientific? Read another way, the question can also sound arrogant and chauvinistic. It is easy for North Americans and Western Europeans to dwell comfortably in their "developed" world and convince themselves that their own experience of the drawbacks of their kind of life is sufficient reason to discourage the rest of the world from becoming more technoscientific. Self-honesty about this issue will never come easily, but at least we can avoid the hypocrisy of ignoring the determinately historical "place" from which we speak. Recall Ihde's fictional image of the new Adam, living in a Garden of Eden purified of any reliance on technology (Ihde 1989, ch. 2). Ihde's point, of course, is that the very idea is empty. What would a non-technological life be? To imagine this world is to see that we can't be "there."[6]

Ihde wants to remind us that life with technologies is neither optional nor merely modern. Yet his idea can also direct us to an issue he does not raise. The very fact that we can entertain his fiction shows it is possible to consider what it is like to live a technoscientific existence, and not just attend to this or that technoscientific experience or object or mediated process. As is well-known, Ihde himself does not like to think this way. For him, the time for metaphysical complaints about Technology *Überhaupt* are over, and with a pointed reference to Heidegger, he insists that we should now maintain a resolutely concrete focus on "actual technologies." [7] But we need not follow him. Indeed, considering technoscientific

[5] Agenda items considered include a wide-ranging collection of policy-setting recommendations, covering everything from organizing communities of multilevel, overlapping planning institutions, to support for interdisciplinary research, regional educational policy initiatives, social/ethical guidelines about military vs. civilian research programs, and intellectual property rights (Nordmann, et al. 2004, 4–6, 52–55).

[6] The best account of being-in-the-world as being-placed, or placement, is Casey (2009, esp. 317–48). So long as we assume with Kant that space is ontologically prior to place and emplacement, and that general knowledge precedes knowledge of specifics, it is easy to imagine ourselves as pure thinkers, floating in the general atmosphere of the universal and trans-specific, inheriting nothing and made determinate by nothing. The truth, as Casey argues, is the reverse (320).

[7] See esp. Ihde (2010). Criticisms of Ihde have come from fellow postphenomenologists as well as others though they are usually directed against his relative neglect of sociopolitical issues, not (as here) his increasingly exclusive stress on concreteness and materiality. Among such postphenomenologists are Selinger (2009, 120–25; Selinger 2006, 89–107) and Verbeek (2011, chapter 4); for others, see the *Human Studies* reviews of Verbeek (2003, 225–61); Feenberg (2010, especially chapters 4 and 7); and Misa (2008). My own criticisms of Ihde, in this essay and elsewhere, are focused on his, shall we say, creative reading of Heidegger, and on the price postphenomenology must pay for mistakenly insisting on a forced option between a concrete technoscience and "abstract" philosophies of technology in general (Scharff 2006; Scharff 2010a; and Scharff, forthcoming).

life in the general way of Feenberg or the authors of the EU report bears immediate fruit. For it is then easy to notice that this life, as a way of life, together with the practices that are producing and driving it, just simply has two faces—and this very recognition, to borrow Heidegger's phrase, can give us the power to demote this particular form of living a technoscientific life—a form so dominant it can be felt and experienced as if it were life's only form—from the status of a seeming *necessity* to that of our most familiar, hegemonic *possibility.*

3 Science, Technology, and Comte's Three-Stage Law

Yet why Auguste Comte? Why evoke here the name of the long-forgotten founder of positivism? There are, I think, several good reasons. First, Comte's account of our last and allegedly most mature condition anticipates quite well the general contours of what we mean when we speak of living in the "developed" world, and his upbeat characterization of it represents quite well the default position of most Western technologists, technocrats, and corporate boards, as well as many mainstream philosophers. Second, in his paean to technoscientific life, Comte displays the still widely embraced confidence that a genuinely modern and "positive" age need not and will not ever end. Thus, his enthusiasm for this outlook, together with his willingness to consider only its improvement and never its transformation or supersession, forms a useful contrast with our century's more ambivalent stance. Finally, it is instructive to see how the name of Comte has disappeared from the philosophical scene, while in surprising ways his outlook has not.

Comte, we might say, is the last honest positivist, in the sense that he actually tries to defend the technoscientifically optimistic outlook from which he speaks.[8] Indeed, he regards his defense as internal to the life he is already living, not external and speculative the way he is often interpreted. Comte actually thinks that explaining why our only real knowledge comes from science and why a thoroughly technoscientific life would be so wonderful is part of his job as a philosopher and as what we now call a public intellectual. Perhaps we can excuse most persons today for not putting this question on their to-do list; but philosophers are supposed to be concerned with such matters. Yet sadly, today's philosophers often do not know themselves very well. Many continue to share, deeply but unreflectively, Comte's

[8] The point I am pursuing here is about Comte's honesty, not the precise nature of his positivism. At the very least, to be a positivist has generally meant (a) to embrace some species of scientism (viz., that all genuine knowledge is obtained by combining empirical observation and logical reasoning in a manner best exemplified by the natural sciences); (b) conceive scientific practice primarily in terms of its procedures for confirming theoretical claims; (c) at least stress and maybe insist upon a fundamentally secular and technoscientifically progressive attitude; and (d) redefine all remaining issues still deemed legitimate but not directly scientific (e.g., ethical, sociopolitical, aesthetic, and engineering questions) as dependent on scientific findings and "the scientific view of the world." What is interesting about Comte, however, is that he still thinks these general commitments need to be historico-critically defended by anyone who wants to be a positivist. Most later positivists, and especially the twentieth century logical empiricists, assumed that all of this is too obvious to need defense, and as a result these commitments have survived quite nicely among many philosophers who see themselves as postpositivists simply because they reject the specific program the later positivists built upon all this obviousness (Scharff 2010a, 458–60; 2002b, 6–11). Regarding the rejected program itself, it might well have been enough to cause a reincarnated Comte to deny he was a positivist (Pickering 1993, 693–97).

philosophical preferences. Hence, a short rehearsal of Comte's positivism can still teach us something important.

My discussion of Comte has two parts. First, I review his famous three-stage law. Today, it is typically interpreted either as a discredited empirical theory or as the keystone of a hopelessly old-fashioned and speculative global narrative. But these interpretations miss the important philosophical point. For Comte himself, the three-stage law serves first and foremost as the basis of a reflective defense of his own outlook as a philosopher. For him, the Western philosophical tradition is fulfilling itself in a scientific era, and he believes that anyone who cares about what human beings really are and really need will therefore seek to promote this happy development.

Second, I reconsider the striking fact that Comte's story remains so familiar. Of course, not many will know it to be Comte's story. Yet the story itself still seems eerily on target about the way—like it or not—that science, technology, and their inevitable interactions really occur today. Ultimately, I want to show that our technoscientific age appears to come with a Comtean story already attached—a story still remarkably telling in its assumptions about what sort of lives we can expect to live in a world of modern technology and modern science, but also a story that is now impossible to retell without at least some serious doubts and suspicions that Comte himself did not entertain. I will suggest that we all already have or inherit Comte's positivism, in something like the way we already have our native language in a serviceable condition before we encounter any good teachers of it. This inheritance provides the initial context for all those Feenberg-like generalizers we might well find have important things to say to us. But of course, the "we" in this statement is used too innocently and ambiguously. From a shared familiarity with today's technoscientific life, it does not follow that everyone experiences the ratio of its benefits and costs in the same way. Hence, I ask readers to consult their own inherited sense of science, its techniques/applications, and its implications for life, to test what I say in "our" name.

I turn first, then, to Comte's three-stage law itself.[9] It is, says Comte, the story of our intellectual maturation. As we grow up, our minds "successively make use of three…different methods of philosophizing." Given the right circumstances, each person, each culture, each branch of our knowledge, and the human race as a whole will "necessarily pass through three different theoretical stages: the theological, the metaphysical, and scientific or positive."[10] For Comte, theology, metaphysics, and science are much more than just three successive means for producing systems of knowledge. They are three developmental stages on life's way—that is, three progressively more astute intellectual orientations toward everything that matters; and as we pass through these stages, we also develop, with a time lag, correspondingly appropriate forms of sociopolitical organization. Comte's famous slogan, "Order and Progress," still appears on the flag of Brazil. Given knowledge of the natural and social *order*, its application makes *progress* toward a better existence

[9] For analyses of the three stages, see Scharff (2002b, 73–91; 1991, 184–99).

[10] Comte (1830–42). *Cours de philosophie positive*. I: 1–2 (partial English, 1988, 1), hereafter *Cours*; Comte (1851–54) *Système de politique positive*, 77 (English, 1875–77, 547), hereafter *Système*; and Comte (1844) *Discours sur l'esprit positif* (English, 1903), hereafter *Discours*. In both cases, I cite the French first, followed by the English translation, if available.

possible. The issue, of course, is what real knowledge is, and what sort of progress can be truly satisfying.[11]

Comte agrees with Aristotle that human beings by nature desire to "know," but in contrast to the ancient philosophers, he thinks that what we most wish to know is how to subdue our natural surroundings and achieve social peace. In searching for the kind of knowledge that can give us these things, our minds successively take theological, metaphysical, and scientific forms. Each kind of thinking arises from a distinctive interpretation of what there is for us to experience. Each responds with a distinctive sort of theorizing—what Comte calls one of three "ways of philosophizing"—and the two later stages must be understood, not as mere rejections of but as improvements over the previous stage(s).

Theology For Comte, famously, theology constitutes our necessary intellectual "childhood." Both in history and for individuals, human beings initially face a theoretical "vicious circle" (*Cours* 1, 9/5). On the one hand, we lack reliable theories about our surroundings, since such theories must be based on previous observation, and of course, at this point there is no "previous" anything. On the other hand, fruitful observation requires guidance from established theories, and there are none. The "primitive" theological solution is thus the only possible one. Quite "spontaneously," primitive minds react to surprising and disturbing encounters with their surroundings by deifying whatever things or events appear to display more power than we have. In other words, primitive theology is animistic, or fetishistic. Our earliest "theories" are direct, experience-based, imaginative responses to the awesome and the unexpected.

To Comte, the most important fact about our intellectual beginnings is that all animistic theories have at bottom the same purpose. They are stimulated by the practical-minded hope that if we see and acknowledge what is happening the right way, we may obtain the means to reestablish a more predictable and peaceful existence. Here, for Comte, lies humanity's original and fundamental sense of things. We start life with a deep and unquestioned faith that everything is essentially just fine with the world, or else that it can and must be made so again. Animism is thus a first attempt to restore order to a temporarily disrupted existence. Sound familiar? Primitive minds are not "savage" minds; they are just like ours, but their theories are not very good. It is not Francis Bacon who first taught us to think of gaining power over nature for the sake of controlling it. According to Comte, the idea that knowledge is power reflects our basic instincts.

It is true, Comte admits, that these earliest theologies—feeling- and imagination-driven as they are—"overstimulate" the mind and encourage us to assume that we can find all the answers to life's greatest mysteries. We need these excessive incentives at a stage when no mind can yet appreciate the value of the painstaking, repetitive process of experiment and instrument-aided "observation." Moreover, these early speculations teach us for the first time what it is like to theorize.[12] This is

[11] *Cours* 1, 63/38; *Système* 1, 1–7, 321, 701-705/1-5, 257, 566–70. See also *Discours*, 45/72. In the *Système*, Comte goes still further, adding a third idea to the slogan. From the improvement of our natural and interpersonal circumstances, there will eventually arise a similar improvement in our affective life, and self-centeredness will begin to give way to universal and benevolent "love"—because although "we grow tired of thinking, and even of acting; we never tire of loving" (*Système* 1, 1/1).

[12] "[I]t is experience alone that has enabled us to estimate our abilities rightly, and, if man had not commenced by overestimating his forces, these would never have been able to acquire all the development of which they are capable" (*Cours* 1, 10/5).

philosophically crucial. At the very start of the very first stage of our intellectual development, all the human faculties spontaneously achieve initial expression. We begin to realize that we have these faculties, and that each of them plays a role in obtaining knowledge. Furthermore, the gains here are not just intellectual. By giving us guidance for social interaction, even the earliest theological speculations already ground an original form of universal practice. In retrospect, we might say that Comte sees in prayer and ritual our first technology, that is, our first globally oriented effort to seek theoretical guidance for actions which enables us to accommodate and restore those disrupted natural and social relations that initially stimulated our speculations.

Given this conception of the reason we start thinking, it is easy to see why the mind is eventually driven by both theoretical and practical dissatisfaction, first to more sophisticated forms of theology and ultimately past theology itself to a second stage. The unsystematic and superstitious nature of animistic and polytheistic beliefs finally proves intellectually intolerable and practically ineffective, and we are driven toward monotheism. Yet ironically it is monotheism itself—that seemingly most rational and systematic theology of all—which demonstrates how cognitively unsatisfying all theology must inevitably be. For if there is a cosmically necessary order of things, then it is the laws of cosmic necessity not the fact that the god(s) happen to make of use these laws, that we need to know—both to understand nature's comings and goings, and to respond appropriately to these events (*Cours* 5, 297 ff.). With the emergence of this realization, thinking turns metaphysical. In fact, Comte observes, theology's influence on the Western intellectual tradition is relatively (and deservedly) short-lived.[13] Long before most people are fully ready to abandon God-talk, the "metaphysical" stage is already latent in the advanced theologian's efforts to reason logically, develop mathematics, demand conceptual clarity and systematic theorizing, and engage in argument.

Metaphysics For Comte, then, metaphysics expresses our intellectual "adolescence." It is the age of rigid logical distinctions, deductive reasoning, and mathematical certainty—all initial signs of intellectual virtue that eventually get overvalued. Yet in the beginning, metaphysics is the time of one's first experiences of reason's liberation from feelings, superstition, and nonrational belief. Adolescent minds grow conscious of possessing the power to develop logical distinctions and demand independent thought, and in this respect make a solid advance over theology, whose appeals to superstition and authority short-circuit the mind's attempts to be rational and ultimately block the road to any real knowledge. Comte is thus as emphatic about the progressive significance of metaphysics as he is about its

[13] Comte actually admires the act of believing faith for its felt intensity, its preoccupation with the concrete and experiential, and its way of informing the whole of one's life. For these reasons, he admires fetishism above any other theological outlook. Indeed, the spirit of fetishism is as central to his conception of positivist culture as of the positive spirit. Grange (1996) calls the grand subjective synthesis of reason and feeling toward which our age aspires a "new fetishism" (17–19). No amount of scientific progress will ever produce an "objective" or absolute synthesis, either of the natural or social order. Our sense of the unity of nature and social harmony will always remain "subjective" or "fictional"; and it is in fetishism that we find the purest expression of both the struggle to "subordinate the subjective to the objective"—*and* the recognition of the "fundamental preponderance of the heart over the intellect" which mature positivism is finally in a position to appreciate fully (*Système* 3, 82–122/68–101, quoted from 121/100 and 120/99).

limitations. For him, it is just as important to praise the metaphysical era as the period of reason's liberation as it is to condemn it as a time of speculative fixation on abstract doctrines of inner essences, hidden causes, and a priori principles. Ironically, the metaphysical mind's initial experience of liberation is also the source of its greatest weakness. For it always tends to become captivated by its own sheer logical power.

The problem, says Comte, always runs the same course. Starting from supposedly self-evident conviction(s), metaphysical minds create competing dogmatic systems.[14] Since pure reason is now the final court of appeal for truth and each viable system is capable of being made logically consistent, all disputes between systems become endless and irresolvable. Yet cognitive impasse is not the worst of it. Given that their first commitment is always to something that is allegedly "self-evident," metaphysical thinkers are never more than indirectly focused on practical concerns.[15] All of them wind up so enamored of their intellectual creations that they grow increasingly inattentive to what is actually experienced. In the end, rational pride and rather than a love of truth dictates choices among the systems. A mind that knows it must be right because what it holds is "logical" is an arrogant and imperial mind that offers us neither genuine science nor ideas for a better life.

At the height of the metaphysical stage, then, the famous notion that "man is a rational animal"—the idea that our mere possession of the power to think abstractly, free from authority and emotion, somehow elevates us above the rest of nature—begins to ring hollow. The real problem with metaphysics is that glorifying the "life of reason" and rational principle promotes infatuation with argument, analytical clarity, unified systems, and abstract rules. Sound familiar? Given that metaphysics is a stage of intellectual development for everyone and at no time will everyone be mature at once even under the best circumstances, we should not be surprised to find many dogmatic but perfectly rational thinkers in any era.

[14] In the early excitement of formulating nontheological theories about nature, the sense that these theories actually represent nature is strong. However, as intellectual ties with theology grow more remote and "feeble," the nominalistic character of these new theories becomes glaringly obvious. Eventually these naturalistic theories, repeatedly refined and nuanced by incessant logical analysis, become "so empty through overly subtle qualification that all right-minded persons consider them to be only the abstract names of the [natural] phenomena in question" (*Cours* 1, 14/8).

[15] For Comte, a metaphysical thinker is pretty much anyone whose mind tends to remain made up, even when the facts say otherwise. Armed with this definition, we might be tempted to search in Comte's writings for specific persons he opposes, but this would miss the main point. For him, the focus should remain on the kind of philosophizing metaphysics is, not who practices it. Metaphysical thinkers are in "transition" from theology to science, at once struggling to rationally overcome their obedient and immature tendency to privilege all sorts of nonlogical beliefs and feelings, and yet precisely because of this effort not yet in a position to appreciate that the one source to which reason must rightfully listen is "observation." Hence, most persons Comte actually names are ultimately given a dual interpretation. Descartes, for example, is clearly a metaphysician in grounding natural knowledge in certain innate ideas, but he is also a protoscientist in emphasizing the need for an educated mind to always follow an "order of reasons" (where that order is no longer just mathematical, but is also eventually bound to "discover causes by their effects"). And the French Encyclopaedists are clearly committed to impossibly abstract ideas of republican government, but they are also defenders of an independent rationality that both opposed the *ancient régime* and paved the way for the Revolution. Perhaps, for understandable reasons, the one person Comte presents in a way significantly imbalanced in the direction of his nonpractical dimension is his mentor, St. Simon (Pickering 1997, 15–20; 1993, 186–99).

In the end, then, the practical result of the metaphysical outlook is really no better than that of theology. Since pure reason is no more capable of gaining universal assent for its claims about what there is and how to live than theological belief, whenever changing hearts and minds is the goal, force inevitably replaces reason. Advocates of metaphysical systems, when faced with advocates of other metaphysical systems, treat their systems as ideologies to be defended at any cost. Again, sound familiar? Whether one is killed in the name of a rival religious system or a rival ideology, one is equally dead.

Science Eventually, then, the intellect faces the prospect of genuine intellectual "maturity." The metaphysical mind recognizes the desirability of transforming itself into a positive or scientific one. It becomes clear that, although reason should never be a slave to feelings or superstitions or alleged revelations, neither is it fit be its own authority.[16] The key is to recognize that ultimately what makes any theory true is its correspondence to observable reality. Studies of phenomena that can actually be seen, measured, and manipulated begin to replace the old search for answers to life's great mysteries. Field by field, from mathematics to sociology, scientific naturalism (which explains mechanistically *how* things work) replaces metaphysical naturalism (which only conjectures teleologically about *why* they work).

Given my purposes here, I take special note of Comte's opinion of sociology or what we would call social science. Philosophically speaking, he says, it is the most important science. For its understanding of social behavior will ultimately make it possible to establish a truly peaceful and prosperous world—a world in which not only is nature subdued but societies are structured so that people, and peoples, can flourish in harmony. In later works, Comte adds another science to the familiar hierarchy—a kind of capstone discipline he calls morals (*morale*)—which he defines as the science of the application, for humanity's benefit, of the knowledge gained by all the other sciences.[17] Whereas in earlier stages, a mind would have insisted on structuring societies around the One True Theology or Metaphysical System, in the scientific stage, the mind knows that the real foundation for a stable society is not faith-based belief, or abstract rational principle, but observed fact. Science is thus the basis of a third and final form of universal practice—namely, a truly global "applied

[16] Indeed, the mind's coming to see this point by living through the limitations of metaphysical thinking is precisely the "transient utility" of this stage: "In its radical inconsistency…[the metaphysical] spirit retains all the basic precepts of any theological system, but in a way that increasingly deprives them of the power and stability which is indispensable for their effective authority. Bringing this about is, in fact, the chief transient utility of metaphysics; for although the old [theological] regimen had long been a progressive force in human evolution…it inevitably reached a point of wholly inappropriate prolongation and threatened to perpetuate the stage of infancy that at one time it so happily guided" (*Discours*, 15/10; also 35-40/53-64).

[17] The entire "46th Lesson," or lecture, in *Cours* 4 (1–233) spells out how the theoretical development of "social physics"—the term replaced thereafter by "sociology" starting near the end of this lesson (200)—will issue in a "positive politics" that serves as a guide for social reorganization along secular and progressive lines. The whole enterprise will require the use of two methods that are typically seen as "antagonistic" but which really need to be coordinated, viz., an "objective method" for studying both human beings and nature which starts from the simplest natural phenomena and develops physical and social sciences, and a "subjective method" that "starts from man" and determines how best to "synthesize" all the objectively obtained knowledge, not intellectually but practically, for the betterment of the human condition (for summary and numerous citations, see Pickering 2009b, 165–66). See also, *Système* 1 (4/xii, 420, 444); Pickering (2009b, 159–245); and Wernick (2001, 27–36).

science"—a technology that both effectuates control over material nature and provides guidance for social reorganization.[18] Again, sound familiar? Certainly, in the North America I grew up in, I heard precisely this combined praise for truly empirical science and truly scientific technology—in the schooling I received, in the popular culture I absorbed, and in the political economy that structured my everyday life. And now I look around and find this inherited social, cultural, and political sense of things promoted the world over as providing the very definition of a mature, fully "developed" society. The Comtean imagery is everywhere. Even if it is no longer routinely accepted without misgivings, it still has great *currency*, expressive of how one usually thinks about these matters.

Comte's law, then, is not just Comte's measure of his own outlook (Pickering 1993, 2009a, 562) but still depicts the strong, perhaps even dominant, general technoscientific sense of things in our own time. Seen this way, Comte's three-stage law is philosophically relevant, not just historically interesting, and finding effective ways to critically reassess it will not be easy. For if science is understood as developing *from* theology and metaphysics, if the idea of scientific knowledge as the expression of intellectual "maturity" gets its power and global reach from being construed as the very source of development, progress, and the promise of controlled natural order and social peace, then a critical analysis of its possible weaknesses must necessarily start from within a deep sense of developmental indebtedness. It is tempting to assume that nineteenth century scientism is just a "world-view," and that now we live in the twenty-first century where we are perfectly capable of simply "choosing" another one. But this is self-deception. Positivism is still too close to us to be understood as an interesting idea. In his reflective utilization of the three-stage law, Comte says out loud what it still seems natural for North Americans and many Europeans to simply assume about science, technology, and society. In Comte's characterizations of it, the third stage is not just a historically later phenomenon; it is the *consummation* of humanity's long struggle for intellectual maturity, protection from nature, and social peace. And indeed, is it not preferable to live in the "developed" world? From what perspective does this question not seem rhetorical? In the next section, I consider further the surprising currency of Comte's historical vision and indicate some of the difficulties that attend any effort to effectively criticize this vision, even if such criticism now seems necessary—even urgent—in a way that it could not to Comte.

4 Technoscience as the "Consummation" of Western Philosophy

To restate quickly, Comte argues that the scientific stage fulfills the aim by surpassing the methods of the first two stages. We have always sought knowledge of our surroundings and always with the understanding that it would give us control

[18] To put this another way: Comte's focus is on the usefulness of science to human affairs, not just the usefulness of the methods and theories of science in finding and verifying "representative" propositions about the external world. He is thus much closer than his progeny to the demand of today's social and cultural studies of science movement, viz., that science be considered first and foremost as a human practice (and thus to be viewed *in relation* to other human practices, not as the authoritative outlook that stands in judgment of them). See Scharff (2002a; and Scharff 2002b, 105–109).

over nature and the means for social peace, but success in these aims comes only with modern science and modern technology.[19] Three features of his position deserve special emphasis here. First, Comte's praise of third-stage life rests on a historical defense of science as an improvement, not a rejection of theology and metaphysics. Second, to understand the aim of science is, for Comte, to see that the ultimately practical–instrumental aim of scientific theorizing manifests the basic concern of all human beings. Hence third, technoscientific success is nothing more than the continued pursuit of knowledge—now defined by its method rather than in terms of the first principles of ideologies or belief systems, and thus conceived as an endlessly revisable response to changing circumstance in the name of human need. In reviewing these features, I will indicate some of the ways that Comte's conception of third-stage life cannot help but leave us with a somewhat more mixed sense of technoscientific existence. In the concluding section, I will consider whether lessening this uneasiness might ultimately imply something like the transition to a genuinely fourth stage, rather than just a Comtean pursuit of more of the same under ever better conditions.

Science, Historically Defended Unlike many later writers, Comte does not depict the intellectual superiority of scientific thinking either as a leap beyond tradition, or as just self-evidently how reason operates when it gets things right. For his logical empiricist progeny, science is understood when its method is formally reconstructed; its historical roots are irrelevant (Neurath 1973). For Comte, however, this approach actually obscures the essence of scientific thinking; for science does not leave theology and metaphysics behind but rather transforms them. Granted, we now understand that real knowledge is limited to observable phenomena.[20] But to understand the point of this limitation, one must already have experienced what it is like to attempt to know more and differently and have failed. So, for example, when Comte says we cannot "know" why we are all here, or whether there is life after death, or if there is a God, it is not because he is committed to a linguistic theory that defines these questions as meaningless. Rather, he now realizes—by, so to speak, recalling his own intellectual development—that answers to these sorts of questions will never be found, because "evidence" is permanently unavailable. Claiming to have knowledge of life's ultimate mysteries is thus the mark of an immature mind,

[19] Comte was amused by prescientific thinkers repackaging their beliefs in "scientific" constructs in a futile effort to sustain their authority. Where we have creation science and parapsychology, Comte had a pseudo-"psychology" that claimed scientific knowledge of the mind's relation to god, based on an "interior" version of the "external" observation used in other sciences (*Cours* 1, 34–40/20–23; *Cours* 3, 774–76).

[20] In general, Comte shares with every "positivist" the view that all knowledge rests on "observation," but his conception of observation bears little resemblance to the narrow empiricist picture developed in the twentieth century (*Cours* 1, 5, 8, 34/2, 4–5, 8, 20). "Observation" has for its "objects" everything from stars and molecules to language and social customs—in a word, anything and everything that can, albeit under ever improving technical conditions, actually be encountered. The problem with "experience" as it is understood in prescientific times is not that it failed to adhere to a formalized Humean empiricism but that it is often a sloppy combination of observation plus felt, imagined, or dogmatically assumed extras (Scharff 2002b, 30–34). Moreover, the last thing that an abstract, metaphysical mind that is just emerging into maturity needs to hear is that there is one abstract and formal version of the "method" by which nature is "measured" (Scharff 2010b, 452–56). In one place, Comte even calls the mind's turn toward observation in disillusion with metaphysics a "radicalization of fetishism" because it tries to recapture in mature form the experiential concreteness of the primitive mind's urge to theorize (*Système* 4, 204/180).

but Comte warns us against taking an atheistic or dismissive attitude toward these questions (*Système* 1, 46–49/36–39). Experience tells truly educated persons to turn to poetry, and art, and music to celebrate these ultimate mysteries, not to religious texts or metaphysical treatises to find their answers.[21]

Here, then, Comte is philosophically more perceptive about—or at least more generous toward—extrascientific thought than many other defenders of scientific knowledge. And many modern minds are no doubt satisfied with this less pinched epistemology, for it allows us to "tolerantly" recognize that trying to actually answer the Big Questions is meaningful, if also immature and ultimately futile. Yet is this "mature" estimation of theological and metaphysical speculation the last word? Of course, we need not pity traditionally committed theologians or metaphysicians—thinkers who are, say, still having trouble deciding whether natural history is better handled by biology or selected Bible verses—who are unmasked by Comte's critique of their pseudo-sciences. But can we settle for the idea that the Big Questions are scientifically unknowable mysteries, and let it go at that? Suppose we try to consider some of these very same topics today, from within a technoscientific culture and without being committed to any dogmatic theological or ideological ideas about them? What does contemporary culture say about the relations between the endless drive for ever-better technoscience and what we might loosely call life's agenda-setting? How dated, really, is C.P. Snow's famous image of two hopelessly divided "cultures"?[22] How much better have we actually become in integrating science and humanistic culture—educationally, sociopolitically, or spiritually? Is the scientism that Comte makes central to the third stage any less dominant and overbearing in our world than it was when Snow complained about it in 1959? Now that we have at least some of the social science that Comte thought we would need for flourishing communities, are we better at asking about the good life, the just society, the nature of beauty? In short, speaking from within a world now dominated by that urge for "Order and Progress" which Comte hoped for, are we satisfied to conceive all these traditional questions as either badly formed expressions of matters best left to science, or as gestures toward unknowable though fascinating mysteries? Comte assumed we would answer yes, and his reasons go to the heart of his position.

The Aim of Science Like most positivists, Comte's conception of scientific theorizing is in some sense pragmatic and instrumental; but more interesting is his developmental argument for fleshing out this position. In retrospect, he says, we see that the traditional stories about philosophy's origin are quite misleading. Theologians often tell us philosophy originates in feelings of fear and mystery; metaphysicians, in experiences of awe and wonder. It is true that for a time, both motivations are indispensable—feelings of mystery, to "overstimulate" the mind to help us imaginatively overcome the vicious circle of initially lacking both theories

[21] Comte was always uncomfortable about the negative and oppositional character of atheism. In this, it is too metaphysical. One should be cautious, however, about giving Comte too much credit in this direction. What he actually wrote about the arts is fundamentally "moralistic and utilitarian," for mostly the arts are praised for building character, quickening one's spiritual appreciation for Humanity, and deepening social and interpersonal bounds. His model often appears to be ancient Greek polytheism (Pickering 1993, 638–41).

[22] See Snow (1993), but also, e.g., Carafoli et al. (2009), Ortolano (2009), and Eldelin (2007).

and data; and later wonder, to liberate reason from superstition and appeals to authority so that it can discover the power of logic and argumentation. For Comte, however, the traditional stories fail to focus on the real purpose of these activities. In the end, theological and metaphysical systems are just as much intended as instruments for the satisfaction of physical and social need as science. For obvious reasons, people already living in third-stage cultures are less likely to remain theological or metaphysical; the flaws and limitations of theological and metaphysical thinking are just too embarrassing. However, we start thinking like scientists not simply to avoid intellectual embarrassment but to succeed where theology and metaphysics fail.

Theological, metaphysical, and scientific thinking are all equally "practical," in the sense that all have the same fundamental interest in seeking the means for controlling our natural surroundings and organizing peaceful societies. As I explained above, behind Comte's historical epistemology lies his understanding of the human condition as one in which we all begin with the sense that nature and other people for the most part behave as expected, and thus make our own existence possible. In contrast to Hobbes, for example, Comte thinks that there have been so many nasty, brutish, and short lives, not because this reflects our nature but because social life has so far been defined by childish and adolescent minds.

For Comte, the ancient images of the harmony of the spheres and of a cosmos in which everything is busy being itself are more than metaphors. They signify the condition of a normally functioning world, the disruption of which motivates intellectual development. Looking back from our individually and collectively having been theologians and metaphysicians, we realize that what we have always most deeply wanted is knowledge that facilitates the predictable and livable future we all begin by expecting; and from the failure of our theological and metaphysical speculations we see also that obtaining this knowledge really has nothing to do with worshipping mysteries or finding hidden powers behind what we observe. Instead it involves "observation"—that is, a technical processing of what we actually encounter, an attentive seeing and recording of the comings and goings of natural "objects" followed by a calculation of what any knowing "subject" might expect from them (and objects like them) in the future. Thus, to understand science and appreciate the promise of the technologies produced by and associated with it, one must look beneath the traditional stories, epistemic reconstructions of right reasoning, and even the moral and engineering principles that guide our practice. The real value of scientific theories and engineering designs lies not in their potential to give us control of nature and peacefully organized societies but in the fact that this is their ontological point.

Progress Through Endless Theoretical Revision Again, this all sounds very familiar. Comte's cumulative story makes it seem entirely natural for some of us to see ourselves as part of the "developed" world, to expect ever more "progress," and to simply assume the rest of the world is understandable in the same terms, as either developed or developing—to assume, in other words, the global reach and "convergent" power of technological life. Of course, we inherit Comte's scheme in modified form. Many of us no longer define technology as merely applied science—that is, ignore the technologies of research itself or regard scientifically guided technologies as the only real technologies, or assume that using technologies is

entirely a matter of following their original design (Nye 2006). But these are all variations on a Comtean theme, still directed toward systematically understanding the world's usable order. [23]

Just what, however, does the Comtean story commit us to? Is he right that all thinking is, at bottom, primarily moved by the desire for technoscientific prevision and for the satisfaction of natural and social needs as Comte understands them? Earlier, I cited a number of familiar critical views concerning our current "way of being technological." All of them identify one or more pervasively problematic features of technoscientific life; and do so in the name of some aspect or feature of their lived-through sense of this life that seems to them occluded, distorted, or otherwise mishandled in the normal course of things. Comte himself experienced no such disconnect between his sense of who/how we are and the third-stage possibility of an ever better technoscientific realization to it. But is Comte right in thinking that our primary desires are to control nature and to live in peace—especially when "peace" for him is first and foremost a matter of social "order"? In less privileged parts of the world, a Comtean view undoubtedly expresses genuine and urgent physical and social need. But is it the same for the developed world? If scientists lean on Comtean assumptions when they apply for grants, what sort of research is not done? What sort of politics goes together most comfortably with appeals to ever more control of nature ("technologies extend our natural powers") and social engineering? In short, does Comte's sense of practical mindedness—however extended and pluralized—paint an adequate picture of the *point* (or perhaps points) of life?

It is just here that Comte may well be most provocatively illuminating for us. For on the question of what might come *after* technoscience, Comte is silent. It is not that he raises the possibility of a fourth stage, considers at least its logical possibility, and then dismisses it. Rather, he never considers it at all. For him, the third stage just is the final stage—that is, a successful end*ing* of the quest for natural control and social peace that is itself end*less*. From our theological and metaphysical failures, we learn there is no universal system of absolute truth. Real knowledge is always relative, not in the sense that we may believe anything we want, but in the sense that no claim to knowledge is ever more reliable than the available evidence, and the application of such claims is gauged by the actions it makes possible. In short, Comte never thinks past the age of science because in it we seem to be forever in the

[23] Although I cannot develop the point here, Comte's conception of social peace rests on his accounts of the static and dynamic features of the "external" (i.e., cosmic and biological) orders, and so is much more ontologically weighted in the direction of order than sociality. Given that our earliest conceptions of the order of nature reflect practical understanding rather than abstract reasoning, all the theoretical models in our later scientific view of the world depend on the felt sense of this practical understanding (*Système* 2, 51ff/36ff.). It is easy to see how the imagery of the development of scientific knowledge thus informs Comte's conception of social reorganization, too, so that social order is thought to be achieved by the subordination of individual activity to the collective method by which "true unity" is known, and progress towards this knowledge evokes ever greater feelings of social cohesion and affection. The problem, as Wernick observes, is that given the way Comte sets this up, his notion of the social—as something allegedly more communal than just the necessary socialization of individuals to an internalized commitment to group progress—seems to be undermined and hollowed out by his very presentation of what this is supposed to mean (Wernick 2005, 120–25, 214–20). The implication is, of course, that nineteenth century conceptions of community often trade on analogies with a "scientific community" that is really not "social." Do we inherit this pseudo-communal political positivism, along with its scientistic epistemology?

process of getting what we have always wanted; thus third stage life is not just better than a life dominated by theology or ideology; it is our proper condition and is known by us to be that condition.[24]

However, none of this quite answers the question of why Comte fails even to consider the possibility of something more. Suppose we accept his premise that, when it comes to knowing how to predict, control, and socially order our surroundings, technoscience rules, and there is no going back to theological or metaphysical answers. Is it true that this knowledge, together with all of its possible applications, is, was, and always will reflect our *deepest* desires? Comte would regard my question as either an empty exercise or a sign of nostalgia for theology or metaphysics. In short—and this is the crucial point—because he has no experiential incentive to see beyond his internalist vision of the third stage, for Comte my question cannot make anything more than purely logical (and thus uselessly abstract) sense.

For his story, as he is able to tell it, science really is and appears as the successful realization of what he understands to have been on our minds from the very start. Hence, Comte can think of himself as really belonging without remainder to a culminating event: He thinks comfortably from within its continual development as if it had no outside. He still speaks entirely in terms of what positive science will endlessly become, at a time when its research programs are still more proposed than pursued, when technoscience is still more promise than actualization, and when prescientific thinking still seems more ill-fated than meaningless or merely secondary. In these circumstances, he simply cannot ask whether third-stage life might eventually seem in some basic way unsatisfying or incomplete. He can think modern science and its technologies *as* a culmination, but he cannot think *at* this culmination. He cannot ask, as Heidegger puts it, whether "the world civilization just now beginning might one day overcome its technological–scientific–industrial character as the sole criterion of our journey through the world" (Heidegger 1993, 437). Comte cannot think of "overcoming" what has not yet arrived.

But of course, we can. Now that we are in it, Comte's third stage—and especially any unrelieved optimism about it—seems at the very least unsettling. Is it really self-evident that we humans are *by nature* primarily interested in having power over the cosmos and fostering social control? Much of the interest in order and control seems driven by circumstance more than by something hard-wired in us. Indeed, is anything really hard-wired? Further, can we still say with confidence that it is social scientific expertise that best informs us about how to live or that the political task of bringing the fruits of science to the rest of us will be accomplished by experts whose training and professional standards assure that they will be motivated primarily by the desire to improve humanity's lot? The idea that scientific practice itself is a multiply motivated political activity would have struck Comte as unintelligible; indeed, logical empiricists later argued this as a matter of principle. Comte could still, with a straight face, call his social experts "engineers"—just as Marx would call them "scientific" socialists. Today, however, the fact that these experts always turn out to have extrascientific commitments is not even the worst problem. The very

[24] This is why in my account of his third stage, I do not distinguish sharply between science and technology. In Comte's vision, the two activities ultimately come to facilitate each other for the sake of pursuing the same goal under ever-changing circumstances.

organizations and institutions that Comte would have pictured as smoothing the way for technoscientific progress now often seem incapable of being made efficient enough to handle the risks presented by the intensification of the presence and use of technologies.[25] Of course, these are twenty-first century thoughts framed by nineteenth century ideas. But that is just the point. We inherit Comte's optimistically projected picture of our "developed" world, but we must ask out of our own more ambiguously experienced sense of this situation what to make of it.

5 Third-Stage Life: Improve or Surpass?

Let us admit, first, that all of us are to some extent happy Comtean pragmatists—and to the extent we are, we need all the concrete studies of technoscientific life that pragmatists, phenomenologists, postphenomenologists, et al., can produce. The fact is, many technological practices do enhance human lives in just the ways that Comte envisioned; and if we still know less about social reorganization that Comte expected, what we do know often does improve social relations—barring interference from those who still think the principles of social planning should be theological or ideological. Perhaps in a black mood, we might imagine giving all this progress up, but as Heidegger says, we cannot really "think" it.[26]

Moreover, there is nothing inherently utopian about Comte's picture of intellectual maturity, and hence no need for a dystopian response to it. [27] His

[25] In addition to Feenberg, see, e.g., Beck, who sees trouble in our becoming ever more modern, not postmodern. Effective social planning, with its cost–benefit analysis and mathematical calculations of risk avoidance and compensation, have become empty fictions. Every innovation now seems to bring greater unexpected and dangerous consequences, no matter the intention. In fact, it seems as if every course of action risks globally threatening, incalculable consequences that we must be forever trying to prevent because once actualized, they cannot be fixed. But Beck is no dystopian; for him the culprit is nationalism and free-market capitalism, and the answer is an "alternative modernity" (Beck 2009).

[26] In his later works, Heidegger increasingly distinguishes between his way of philosophizing (as "thinking" or sometimes "meditative thinking") and that of the dominant Western tradition (as cognizing or "representing"). So, e.g., in one famous passage, he asserts that scientists (and, we may add, philosophers who fancy their activity as science-like) do not "think"—meaning, not that they are stupid, but that in their role as scientists (or scientific philosophers) their focus is on doing *empirical research and systematic conceptualization of an objectively knowable world* (and the analysis of the "method" for doing this), and everything I just put in italics—the whole mode of being-in-the-world called "knowing" and the whole general ontological way of understanding what is really real for knowers, viz., object-being—is not only left reflectively unconsidered but hidden under the confidence that they have, after all, started in an unbiased way by embracing a universal "(but silently objectivistic and cognitive) method" for justifying what they do (Heidegger 1968, 8). The distinction itself goes back to Heidegger's attempt after 1919 to develop a way of philosophizing that speaks in "formally indicative" concepts that keep what is thought-worthy in mind, instead of following the usual course of conceptually comprehending everything and thereafter analyzing what has been captured in the concepts rather than remembering the way of being and our being related to whatever is thus conceptualized (see, e.g., Kisiel 2008, 41–67). My point here is that Heideggerian thinking has to do with an experiential/ontological "place" out of which both formal indications and representative concepts arise, and our "place" is not (and indeed never was) pretechnological. Such a place obviously cannot be thought—though we can imagine it, consider it as a logical possibility, perhaps even build a whole "philosophical" career out of arguing what it would be like.

[27] Feenberg (2010) notes that technoscientific utopians always falsely assume that controlling modern technologies is basically no different from handling traditional tools; dystopians typically ignore the fact that "once inside the machine, human beings…gain new powers…to change the system that dominates them" by, for example, using devices in ways never planned by design (61).

optimism is not a function of any expectation of some ideal future state. In his view, science is to theology and metaphysics what adult language is to baby talk and teen speak. Human development never runs in reverse, but neither mature knowledge nor adult speech will ever achieve a moment of perfection. The law of life, like the law of nature, is change—often, perhaps even mostly, change we did not see coming and do not understand. But adults know how to seek new knowledge, how to revise a course of action on its basis, and even how to continually correct and improve the methods of science and engineering that facilitate this endless process. When the world functions in this Comtean way, does it not seem ungrateful to critique Technology *Überhaupt* instead of concretely studying it? The question seems merely rhetorical.

But of course the world often does not function in a Comtean way, and on these occasions we get a glimpse of the high price that concrete thinkers about technology pay when they clear a space for themselves by opposing the unconcrete. Note first that if the default expectation is that things are being made ever better, this implies that eventually every technoscientific practice will turn out to be flawed, misused, overused, or just plain wrong. Utopian and dystopian exaggeration aside, how should we understand this? According to a growing consensus, the question should be answered piecemeal, only after initially taking an empirical, postphenomenological, pragmatist, or constructivist turn. But is this right? Is it enough to cultivate what one author calls an "analytic sensibility" that primarily focuses on the specific "corporeal, political, societal, spatial and temporal complexities of everyday life," and that critically intervenes only in the face of some specific "woolliness" in technoscientific affairs. Especially is this enough if even in the event of these occasional interventions, one regards them merely as expressions of "simply another critical voice that enters into the melee…out of its own peculiar (contestable) everyday life" (Michael 2006, 152–54).

What sort of woollinesses might such a sensibility consider? One would undoubtedly be the controversy over biotechnological distinctions between therapy and enhancement (Fukuyama 2002) involving everyone from bioconservatives to transhumanists (Bostrom 2005). But notice what just another mind focused on a specific woolliness will not see. Behind these "visible complexities" lies deep disagreement over how to understand the human nature that is getting treated or enhanced, and how to handle the privileged idea that whatever this nature is, making it "better" is desirable. In other words, the visible complexities often form a pattern; they belong together and manifest a deeper disagreements about the good life—together with an inherited tendency to favor an ontology of technical manipulation and endless improvement regarding this issue (Kompridis 2009). Such matters require more than the mentality of someone looking for "visible" complexities and have already assumed the false modesty of being "simply another voice entering the melee." No one thinks of themselves as "simply" another voice when the atmosphere is thick with competing senses of how to live.

Also among the woollinesses likely to be noticed is the controversy over AI's success in modeling cognitive processes, and the multiple voices of those who are excited or skeptical about its significance. Will "simply another voice" address the deeper question of whether computation and information processing are ontologically rich enough ideas to ever genuinely "model" human mentality in its very being

(Dreyfus 2007)? Or, to identify a couple more woollinesses quickly, can we expect a genuinely critical intervention from "just another mind" upon its discovery of the underrepresentation of women in engineering or of the way features designed into artifacts tailored specifically for women or men reinforce gender stereotypes? How would one fight off the conviction that it is just too abstract and general to consider how technologies in the developed world tend quite typically to be gendered in masculinist ways (Faulkner 2001)? Finally, it would be one thing to critically consider the costs, benefits, and cultural trajectories of specific technologies in contemporary life as "we" understand them. But will this lead naturally to any self-critical questioning about the limitations of this understanding—in relation to other times (e.g., ancient cultures),[28] other places (e.g., the Far East, Heikkerö 2005) or other conditions (e.g., in developing rather than developed countries)?

Viewed in relation to Comte's law, it appears that philosophers of technology who favor concrete studies and distrust everything else may actually be giving new life to Comte's technoscientific optimism, at the very moment when the whole cluster of background assumptions built into his understanding—assumptions about human nature, about the endless malleability of scientific and engineering practices, about the control of nature and social reorganization having basically the same ground plan—are themselves being identified as main sources of our discomfort. From the perspective of the study of any given technology, its flaws and limitations can always be conceived as something to be improved or surmounted by more science and better engineering. But on its face, it hardly seems enough to say that we want a philosophy of technology that "steps back from a high altitude or transcendental perspective" (Michael 2006, 154) so that it can appreciate "the multidimensionality of technologies as material cultures within a lifeworld" instead (Ihde 2009, 22). And no number of concrete studies is likely to "force philosophers to own up to the real world effects of their rarified speculations, their logic chopping, and their hair-splitting avoidance of the real world and its problems" (Pitt 2011, xiii)—if for no other reason than the fact that some of the thinkers that appear this way to Ihde and Pitt do not understand themselves this way at all.

Of course, the figures cited above do not always or only advertise themselves in such stridently empiricist or pragmatist or postphenomenological terms, and I am not interested in developing a scale for measuring degrees of radical concreteness in philosophies or philosophers of technology. Nor, obviously, do I want to declare a moratorium on producing any more of the really illuminating sort of studies that are now coming from the new empiricists. Nevertheless, it is relevant—in a way that Comte sees and his logical empiricist progeny do not—to ask what sort of philosopher of technology one is being while one is promoting the white-hat activity of real world studies and opposing black hat distractions of rarified speculation. Mathematics, Collingwood once said, is permitted to think in one direction by refusing to think in another, because its first principles can be made wholly explicit;

[28] "What makes the study of ancient technology such a Herculean task are the nature of our data, the temporal scales at which we work, and the likelihood that many prehistoric technologies have no modern analog. Clearly, different ontologies lead researchers to emphasize different processes, ask different questions of the archeological record, and use decidedly different analytic 'techniques'. This plethora of ontologies, epistemologies and methodologies is likely *necessary* to grapple with such a complicated and multi-faceted subject" (Dobres 2010, 110).

but philosophy is not allowed to do this, because its beginning assumptions cannot. Hence, "turning critical" or looking at "background problems" only when a particular technological mediation seems to call for it fails to acknowledge that concrete studies are not just concrete. Of course, everybody knows now that philosophers do not start from nowhere, but they also do not start from some self-evidently transparent principle of empiricism, or phenomenology, or pragmatism, either; and issuing a humble wave of the hand to the fact that one's practice emerges from within the lifeworld is too little and too late. Even to begin with something so phenomenologically basic and seemingly noncontroversial as embodiment relations is to enact the understanding of very modern, Western, allegedly prescientific ideas about embodiment (Kuriyama 2001)—and thus also to privilege encounters between technologies and individual human beings, to which one only later adds social and political "dimensions," in a way that is much more typical of men than women (Berg 1997).

Empiricist/pragmatist/phenomenological approaches to technoscience have been in business long enough now that their results are beginning to show us something of what it is costing them to work out of their forced option between concrete study and everything else. The price is that the very idea, namely, that there could already be a dominant and unsettling general meaningfulness permeating life in the developed, technoscientific West, is suppressed. This does not, however, make it disappear; rather, it assures that it will get passed on without further ado, still silently understood in its role as a variant of the third stage life that Comte thought would be the last and best—where knowledge of the world is mostly a matter for science; where the best technologies are probably science-guided; where life is best viewed up close and personal, taken one sort of technological "mediation" at a time and only later "contextualized"; where things are distinguished from their value, in that order; and finally where, of course, anyone who has a good word to say about earlier technologies is guilty of being old-fashioned until proven innocent.

In this atmosphere, there can be no consideration of something like Mitcham's idea that we might well become "romantically uneasy" about (without being romantically opposed to) our general way of being-with-technology (Mitcham 1994, 289–97) or of Feenberg's claim that an effective response to the undemocratic cast of modern technological life "is not merely to address particular problems as they arise but to reconstruct modern technology around a new model of wealth that is environmentally compatible and that draws on human capacities [currently] suppressed or ignored" (Feenberg 2010, 215). For me, it is the silence about how to generally understand human nature that seems most troublesome.[29] For Comte, this is the one ontological constant: We care most about controlling or at least restoring predictable relations with nature and with establishing a social order that is immune to the temptations of revolution, and we are therefore most ourselves when

[29] We technologists, says Lanier, "make up *extensions of your being*, like remote eyes and ears (webcams and mobile phones) and expanded memory (the world of details you can search for online). These become the structures by which you *connect* to the world and other people…[and that] can change *how you conceive of yourself and the world*. We tinker with your philosophy by direct manipulation of your cognitive experience, not indirectly, through argument. It takes only a tiny group of engineers to create technology that can *shape* the entire future of human experience with incredible speed" (Lanier 2010, 5–6). When can we expect concrete technoscience studies to address the italicized philosophical topics?

we are scientific knowers related to "objects" and technologically practical doers related to the useful. Today, we are actually experiencing the sort of existence that promises to fulfill this nature by placing us in a condition where we are able to forever obtain whatever we desire whatever the circumstances. The question is whether the whole disturbing array of experiences waiting to be considered at the margins of this happy technoscientific ground plan can be satisfactorily addressed by nothing more radical than the sort of corrections and modifications to positive thinking and acting that Comte expected would be necessary. Or do these experiences—in some selected cluster or taken all together—challenge this very Comtean sense of who and how we are, and therefore call for something like the transition to a fourth stage?

In short, it seems wrong to say, all of the disturbing features of our enframed and set-up world, that they will eventually get domesticated sufficiently to become simply "practical problems" soluble by more of the same under better conditions. We can forgive Comte for never having considered this question himself, since this would have been *for him* a purely speculative and logical exercise. Indeed, it is perhaps a tribute to his commitment to "mature" philosophical reflection that he shied away from such exercises. Comte owes us no general critique of third-stage life—for the same reason we are also not surprised that we get no systematic critique of oracles from Socrates, or arguments against strip-mining from Agricola, or warnings about the evolution of superbacteria from Fleming or Moyer. To us, however, it makes existential, not merely logical sense to question the very atmosphere of third-stage existence. Comte felt free to depict the future as simply more of the same for more of the globe, and there is something profoundly right about this. He does seem to offer both a true and a "developmentally" necessary picture of what is in fact ever more widely occurring. Yet is a world that is increasingly like the third stage he envisaged as satisfying as he expected? All we know for sure is that the very people who now live most thoroughly in this world are not nearly as happy about it as Comte assumed, and as our inheritance of him tells us we ought to be, and as the concrete philosophers of technology urge us to be in their silence about the spirit of the age.

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