

# La ciencia y la tecnología ante el Tercer Milenio

( I )

José Manuel Sánchez Ron,  
editor

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## What the past tells us about the future of science

*Paul Forman*  
Smithsonian Institution

“The past is prologue.” These words — Shakespeare’s, slightly altered — chiseled in stone over the entrance to the U.S. National Archives building, promise much to America’s citizens from the preservation of the records of their national government: their future may be read in these billions of pieces of paper. But, taking still greater liberties with the bard’s words, without method, it would be madness to try to read the nation’s future in that mass of documents from the past. With *science* the task is simpler. There are, after all, not millions of millions, but only thousands of millions of pieces of pertinent paper.

How then might a historian of science productively proceed to predict the future of science? Surely extrapolation may be based on the scientific concepts and theories accepted today, or, more surely still, on long-standing research programs that have achieved great success. Yet historians of science would quite generally agree that the future of science is not to be found in the study of the historical development of scientific concepts and theories. This ‘paradox’ ought not be surprising. It is, after all, one of the principal theses of Thomas Kuhn’s *Structure of Scientific Revolutions*. Kuhn, famously, contended that every revolution in the concepts and theories of a science establishes a new “paradigm” and thereby sets that science off in an entirely new and unanticipable direction, begins a version of that science “incommensurable” with all previous versions.

One need not, however, subscribe to Kuhn’s view of scientific development — and I do not — to agree with him on this point: a science’s program for its conceptual advance is a strikingly poor predictor of that science’s key concepts thirty, twenty, even ten years into the future. Take, for example, the program of research that guided and dominated theoretical physics for most of the 20<sup>th</sup> century, the program of reduction of the ‘objects’ studied to the properties of more elementary entities, and those entities to still more elementary entities. The success achieved by this pursuit of the “fundamental” over the first three-quarters of this century was so great and so unbroken that its continued success, and certainly its continued standing as the most esteemed research program in physics, would in 1975 have seemed a safe and sure prediction.

But in this last quarter century physicists have largely turned away from that program — not merely because further progress encountered great difficulties, but even more because in postmodernity that pursuit of fundamentality has lost its ‘obvious’ primacy and importance, lost it not merely in the theories of postmodernists, but also in the minds of contemporary physicists<sup>1</sup>.

What is at issue here is no gainsaying of the cumulative character of the science, no allegation of subject matters lost from it because inexplicable by the new paradigm, but, on the contrary, an unprecedented widening and pluralizing of the science, transforming the structure and content of its knowledges from a narrow and exclusive hierarchy to a broad and inclusive parity. Kuhn’s scheme cannot comprehend this, nor can any other purely conceptual ‘story’ account for this revaluation of what physics should be and do.

As the case of reductionism in physics already implies, the anticipations of engaged scientists provide no reliable insight into the future conceptual development of science. This is because all forward-thinking scientific conceptualizing (better, programizing) is inherently illusory. By ‘illusion’ I mean, following Freud, a conception that is sustained by a wish. Illusions lead scientists onward, but, like mirages, they are rarely realized in the advance of science. Take, for example, “biology is an information science,” the mantra of Leroy Hood, who is famous for being constantly in the forefront of biomolecular technoscience<sup>2</sup>. Indeed, it has become trite to predict that in the 21<sup>st</sup> century science will reconstruct itself on the basis of an informational rather than a material ontology. Most probably, however, it will not be very long into this century before that anticipation comes to be looked upon as the product of a foolish enthusiasm. Undesired outcomes, by contrast, are generally appraised far more realistically. This difference is well reflected in the science fiction literature: its enthusiastic extrapolations are nearly always far off the mark; its striking successes are found in dystopic anticipations of future social organization. And it is with such that this forecast of science’s future is chiefly occupied.

But to return to the historians: by what means or method are they able to say something significant about the future of science? In view of the poor predictive value of the conceptual history of science, if historians can indeed tell something likely, it must be because they have not confined their studies to the development of scientific concepts and theories. Two features especially distinguish the history of science as it has been pursued over the past three decades: one is an enormous growth in the number of scholars at work in the field; the other is an emphatic shift in the focus of interest of those proliferating scholars and in the topics on which they write. That shift in

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<sup>1</sup> SCHWEBER, S.S., “Physics, community and the crisis in physical theory,” *Physics Today*, Nov., 1993, pp. 34-40; Cao, T.Y., and Schweber, S.S., “The conceptual foundations and the philosophical aspects of renormalization theory,” *Synthese*, 1993, 97: pp. 33-108.

<sup>2</sup> SMAGLIK, Paul, “For my next trick...” [Leroy Hood’s new project], *Nature*, Oct. 19, 2000, 407, pp. 828.

attention is from the development of scientific concepts and theories to the historical circumstances under which science has been pursued, and under which scientific concepts and theories, along with associated scientific practices, scientific institutions, scientific careers, and scientific ideologies, have arisen and have found, or failed to find, acceptance and sustenance.

The choice of so indefinite a phrase as “historical circumstances” is deliberate. It is meant to comprehend the cultural conditions in the widest sense prevailing in the era being examined, including the social and economic conditions, political temper, and world view of society at large, as well as of the institutions by which science is most directly organized and sustained. Through studies of such circumstances, and of the pursuit of science in relation to them, we historians of science have become attentive to the mechanisms and the indicators of the cultural integration of science. We have come to understand that, as a rule, a society gets the sort of science it wants (and deserves). And we have thereby a basis for anticipating changes in the ecology of knowledge in the broadest sense, including plausible inferences regarding the lives of scientists in future decades and the character of the knowledge produced by them.

If, then, I, as historian of science, venture to come forward as futurologist of science, I do so as cultural historian. And consequently my predictions must be developed from an identification of the cultural conditions, in the broad sense of the previous paragraph, that may reasonably be expected to prevail in future decades, and, so prevailing, have determinative consequences for the pursuit of science. The conditions presently prevailing in the United States, and to a lesser, although generally great, extent throughout the world, and in all likelihood prevailing more widely and completely in coming decades, are those of postmodernity.

As indicated by the physicists’s recent rejection of any hierarchy of fields within physics, whether of putative purity or fundamentality or generality or simply difficulty, this postmodern era is both newly established and surely far-reaching in its effects upon science. And as in all major cultural reorientations — and there can be no doubt that we are in the midst of one such — this rapid onset of postmodernity has been brought about by the confluence and synergy of several currents, cultural and characterological, as well as economic and political. The roots of the cultural situation that has overwhelmed us in the last decade go back to the late 1960s. But its uninhibited efflorescence was possible only upon the collapse of the Soviet empire. Its dominant feature is the vacancy of the contemporary cultural horizon — vacant of any utopias, vacant of any absolutes, ideals, destinies, or even destinations. This characteristic — obvious to all the world in the U.S. Presidential election campaign extending through most of the year 2000 — strikes the historian so forcibly because it stands in such marked contrast with the preceding two or three centuries of modernity, centuries in which all Western (and westernizing) societies, and the cultural enterprises they sustained, were oriented to future goals or transcendent ideals.

At the 'highest' level, that of high-powered intellects theorizing, the core of this radical reorientation is the relativizing epistemology, and its attendant denial of any intrinsic hierarchy of value, that over the course of the 1980s came to dominate university departments of literature and, in the 1990s, other humanistic and social-scientific fields to a great extent. At the 'lowest' level — what may be regarded as the characterologic consequence of child-rearing practices since the 1960s — this reorientation is nothing but the egoism and hedonism of the *apres devoir*, post-deontic, the-world-revolves-around-me generation, that is outspokenly addressed and incited by today's advertisements of personal computers, wireless telephones, and similar pretended extensions of the self. Chiefly hedonic in the individual, this egoistic-libertarian utilitarianism is, rather, self-aggrandizing in institutions and in those who control them.

The non-existence of a disinterested interest, maintained on theoretical grounds by postmodernist scholars, is demonstrated daily by an intrinsically anti-intellectual post-modern public. "News you can use" is now the watchword of newspaper editors and television producers alike as they strive to catch the interest of an audience that no longer admits any inherent hierarchy of importance among all the happenings in this world. All issues are appraised from the narrow perspective of personal and institutional interests — and all actions justified by the consideration that "the ends justify the means." This maxim, anathematized by liberals in modernity, is the implicit credo of postmodernity.

Yet these developments of recent decades are, in a deeper sense, the final overt collapse of an ethos that was being undermined for a century and more. Over the course of the 20<sup>th</sup> century the cultural practices 'capitalism' and 'science,' as identified by Weber, Tawney, and Merton, gradually detached themselves from their original ethical and characterological preconditions — self-discipline and deferred gratification — even as that archaic ethical and characterological basis sank like Atlantis in an ocean of excess production. And as it sank, another, antithetic — romantic — ethic and world view have arisen to meet and match that reversal of values from salvation through abstinence and capital accumulation to exaltation through acquisition and consumption.

All that we, as a society and culture, are now able to envision is the progress of 'freedom,' understood as freedom of the individual from constraints on his or her personal — i.e., off-the-job — behaviors. As those off-the-job behaviors are increasingly conceived as forms of consumption, i.e., as exercises of 'purchasing power,' freedom is equated with sufficient funds to participate 'fully' in the consumer economy of ever widening 'free choice.'

This fantasy of unbounded personal freedom in an anarchic market is now widely celebrated as the one truly "democratic" form of social organization — where, again, "democracy" is understood not as a form of government, not as the exercise of any power that restrains and constrains the individual, but rather as a sort of universal 'custom tailoring' that ensures to each individual just what suits him 'to a T.'<sup>3</sup> Significant-

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<sup>3</sup> BAUMAN ZYGMUNT, *The individualized society*, Polity Press: Malden, Mass., 2001.

ly, 'the market' is challenged for this title of true democracy only by the Internet, which the younger libertarians are pleased to imagine as a still more anarchic form of social organization. Both are prized as institutionalized rejections of every externally imposed authority or standard of either the 'good' or the 'bad'.

It is the anti-elitist thrust of our contemporary world view that has led journalist Thomas Frank — his *One market under God*, was published last autumn — to label this rising social-political ideology "market populism."<sup>4</sup> It is, to be sure, a "populism" in its rhetoric, yet it is a populism unlike any that preceded it, particularly in being welcomed and promoted by the possessing classes — who do not fail to see in it an effective abdication of democracy in favor of plutocracy, as well as an implicit legitimation of a winner-take-all society. Indeed, "market populism" has as inevitable consequence the establishment of two, and only two, standards of value as final and unchallengeable: how much money a person or corporation has, and how much celebrity — think 'brand recognition.'

Recognizing, then, how unlike our contemporary "market populism" is in its political effects to populism of earlier eras, we should expand this denomination of our present political-cultural era so as to do justice to its proclivity to flight into fantasy and illusion. I propose "romantic market populism" as emphasizing that behind and below our postmodern rhetorical populism is a consumerist ethic sustained by a romantic illusion of individual wills, free and unaccountable<sup>5</sup>. In this era of romantic market populism we pursue a fleeting if not altogether illusory 'happiness' through consumption — consumption conceived, with the aid of advertising, as self-realization and transcendence without personal effort or discipline: only money is required, and if you don't have it in hand you may obtain it immediately and effortlessly as credit.

This postmodern transformation of the modernist orientation — from dutiful, however ideological, aspiration to willful, romantic, self-satisfaction — is captured very neatly in the history of the metric system in the United States, or more exactly, in the popular history of conversion to metric measures from premodern, customary British units.

Well known is the modernist universalism and scientism underlying the creation of the metric system in revolutionary France at the end of the 18<sup>th</sup> century, the century of enlightenment. It is a less known, but most striking, indication of the more than ideological — the millenary, eschatological — meaning of metric conversion that 19<sup>th</sup> century America's most distinctive Protestant sect, the communitarian and celibate Shakers, adopted, promoted, and manufactured metric standards<sup>6</sup>. In this they were

<sup>4</sup> FRANK, Thomas, *One market under God: extreme capitalism, market populism, and the end of economic democracy*, N.Y.: Doubleday, 2000.

<sup>5</sup> CAMPBELL, Colin, *The romantic ethic and the spirit of modern consumerism* (Oxford: Blackwell, 1987), makes an argument for the romantic impulse in the 18<sup>th</sup> century origins of consumerism.

<sup>6</sup> KIDWELL, Peggy A., "Publicizing the Metric System in America from F.R. Hassler to the American Metric Bureau," *Rittenhouse: Journal of the American Scientific Instrument Enterprise*, 1991, 5, pp. 111-17.

working in parallel, even in cooperation, with the metric advocates of modernist, secular, scientific convictions, such as Melville Dewey (1851-1931), the library reformer whose 'Dewey decimal system' was the first universal system for classification and identification of books and journals. And in the first years of the 20<sup>th</sup> century, when faith in reform of society by disciplined intelligence and governmental regulation was at its height, the United States Congress came closer to legislating metric conversion — indeed, quick and compulsory conversion — than it has at any other time in these past one hundred years.

In the 1960s, as Britain and all the British Commonwealth countries committed themselves to metric conversion, America's future position as lone hold-out for British weights and measures seemed economically precarious. With some support from the Congress, a campaign was lunched to persuade Americans to voluntary metric conversion. Consistent with the then prevailing modernist assumptions of an obligation to the objectively better, the tone of that campaign was hortatory: the metric system is inherently superior; hence it is the future; hence you are obliged to learn it and use it. Initially, this campaign had some success with the public. But with no strong legislative support, and the incipient reorientation of American society, of which the first signs were already evident as a turn to the right in the late 1970s, that campaign flagged. In 1981 newly elected President Reagan withdrew all Federal government support, and that killed the campaign for metric conversion.

To be sure, gradually various industrial sectors of the United States have shifted to metric units, partially or wholly, as moved by the vagaries of economic forces. The automobile industry did so already in the 1970s when American car-makers were getting trounced by the Japanese and German competition. By contrast, the higher-tech U.S. aeronautical and space industry has not yet converted to metric units, with the notorious loss of a mission to Mars in autumn 1999 as consequence. This it reckons a small price to pay for a dominance of the world aircraft market that is so great as to oblige Airbus to manufacture in inches.

Meanwhile, over the past two decades the American public has become steadily more resistant to metric conversion, and in recent years the U.S. Congress has passed only legislation *prohibiting* the administration from taking steps toward metric conversion. At bottom, this is due to the postmodern, post-deontic refusal of all pains, and certainly of all pains that do not produce immediate and selfish gains. But opposition to metric conversion is also incited by demagogic organs of the possessing classes; it is grist for their purely rhetorical, diversionary populist mill. Thus one may read in *The American Enterprise*, the popular magazine published by The American Enterprise Institute:

[...] the metric lobby of big government, big business, and big science has been no match for the great spontaneous "HELL, NO" of the American people [...] The Federal Highway Administration has ceased from defacing road signs with kilometric dis-



tances; and though a 1988 law declared metric to be Uncle Sam's "preferred system of measurement," his nieces and nephews beg to differ<sup>7</sup>.

Of this self-centered and self-indulgent faux-rebelliousness, a striking example was presented at the opening session of this congress. With expressions of appropriate indignation, Sir Harold Kroto projected a video of United States Senate Majority Leader Trent Lott, standing before an audience of elite university students, deprecating, to cheers from those students, the compulsory courses in mathematics and physics that he, the future lawyer and politician, was obliged to suffer in secondary school. Of course, Senator Lott explained, such courses should be available for those odd few who may have scientific careers in mind. But only such as have a use for them should have to take them.

With such manifestations of our pains-averse postmodern utilitarianism we come to characteristics of our contemporary culture that directly, indeed *per se*, affect the future of science. But before addressing the implications for science of scientists living and working in the cultural milieu that is taking shape today, a milieu that will presumably only thicken in the next couple of decades, I draw attention to one further characteristic manifestation of the inherent anti-intellectualism of that milieu: the readiness, recently arisen, to label oneself an "idiot."

An index of this seemingly perverse indulgence in self-disparagement is the phenomenal success over the past decade of the 'how-to' book series, *The Complete Idiot's Guide to and for Dummies*. Beginning in the early 1990s with computer software — about which the admission of absence of aptitude carried minimal stigma (a stigma generally carried with some pride) — these book series have exploded in the last few years to include every conceivable matter of contemporary life interest. *The Complete Idiot's Guide* series now has more than 600 titles in print, from "acing the SAT I" through "assertiveness" to "astrology," "astronomy," and "awakening your spirituality" — and those just a selection from the first letter of the alphabet.

But a still better indicator of this world-wide white-collar delight in being free of any obligation to knowledge or competence is the huge success of the cartoon character *Dilbert*. Originated by cubicle-dwelling technical writer Scott Adams in the late 1980s, by 1995 *Dilbert* was appearing in 500 newspapers, and today appears in 2000 newspapers in 60 countries, with a readership of 200 million. *Dilbert* is the *Peanuts* of postmodernity, and the contrast with the basically benevolent world of late-modernity's favorite cartoon strip could not be greater. *Dilbert*, the title character, is a cubicle-dwelling information technology engineer surviving a cynically conceived, inherently hostile contemporary corporate workplace. And although there are strong structural parallels between *Dilbert* and *Peanuts* — both protagonists are amiably inept, both strips include a humanoid talking dog companion, etc. — there are no 'cute' characters: the

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<sup>7</sup> KAUFFMAN, Bill, "No litering," *The American Enterprise*, vol.7, nr 6, Nov./Dec. 1996, p. 87.

talking dog is shockingly cynical, while the talking cat, the “human resources professional”, is shockingly sadistic.

The ‘I-too-am-an-idiot-and-glad-to-admit-it’ attitude underlying *Dilbert’s* appeal comes through most clearly in its creator’s book-length expositions of his world view, *The Dilbert Principle: A Cubicle’s-Eye View of Bosses, Meetings, Management Fads & Other Workplace Afflictions* (1996) and *The Dilbert Future: Thriving on Stupidity in the 21 Century* (1997). Only half tongue-in-cheek, Adams explains that “I have developed a sophisticated theory to explain the existence of this bizarre workplace behavior: People are idiots [...]. Everyone is an idiot [...]. That’s the central premise of this scholarly work.”<sup>8</sup> But satire requires that — to paraphrase George Orwell’s *Animal Farm* — not all denizens of the corporate funny farm are equally idiotic; some — the managers — are more idiotic than the others. They, the managers, are completely and continuously idiotic, while the workers (all white-collar, of course) are only intermittently so — and when not themselves idiotic are shrewdly gaining some advantage for themselves from the idiocy of their fellow workers<sup>9</sup>.

There is no doubt that as we become less verbal (even as we become more intelligent problem-solvers) we are becoming less capable of being intellectual; as we become more hedonic and object-oriented, we become less inclined to intellectuality; and as we become less amenable to oughts, we become hostile to implicit demands that we be intellectual. College students are not now either stimulated by, or intimidated by, but rather complain about, professors whose vocabularies exceed the class’s grasp<sup>10</sup>.

With the recent publication of a collection of the essays by Lionel Trilling, late-modern America’s archetypic intellectual, under the title *The Moral Obligation to Be Intelligent*, reviewers could not fail to note that it “serves to underscore a salient cultural turnaround. The title alone signals how little of Trilling’s intellectual cosmos survives.”<sup>11</sup> In nothing is this more striking than in the demise of Freudianism, in which all intellectuals of Trilling’s generation were steeped, and which made mid-century psychiatry the most intellectual of the free professions. Fifty years on, psychiatry is a thoroughly deintellectualized, pragmatic, pharmacologic technology<sup>12</sup>.

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<sup>8</sup> ADAMS, *The Dilbert Principle*, N.Y.: HarperCollins, 1996, p. 2. Our new willingness to declare oneself an idiot is not inconsistent with our leaning over backwards to avoid making someone else feel like an idiot, which excessive concern to do no harm to self-esteem rationalizes recent grade inflation and the crusade against the Scholastic Aptitude Test (SAT). On the contrary, the two are complementary and mutually supportive: the willingness to call oneself an idiot is predicated upon confidence that no one will be so brutal as to confirm that epithet, i.e., no one will respond, ‘Yes, you certainly are an idiot’.

<sup>9</sup> With ‘the Dilbert principle’ Adams is explicitly offering a cynical-satirical improvement on the ‘the Peter principle.’ Now, rather than managers rising step-by-step until they finally attain their level of incompetence (Peter principle), managers are revealed to be just those employees who are incompetent ab initio.

<sup>10</sup> GITLIN, Todd, “The renaissance of anti-intellectualism,” *Chronicle of Higher Education*, 2000, Dec. 8, pp. B7-B9.

<sup>11</sup> OZICK, Cynthia, “The buried life: Lionel Trilling...,” *The New Yorker*, 2000, Oct. 2, pp. 116-127, on p. 122.

<sup>12</sup> LUHRMANN, T.M., *Of two minds: the growing disorder in American psychiatry*, N.Y.: Knopf, 2000.

Anti-intellectualism is the inevitable concomitant of utilitarian instrumentalism. As Herbert Marcuse observed long since, “One does not ‘believe’ the statement of an operational concept but it justifies itself in action — in getting the job done, in selling and buying, in refusal to listen to others [...]”<sup>13</sup> This is not good news for science as an intellectual activity and a conceptual structure that demands to be accepted. But more and worse follows from that same utilitarian instrumentalism: there are no rules, the ends justify the means. And whose ends? They will be, in postmodernity, just what the individual chooses, or what she who employs or ‘manages’ others chooses for them.

For the elite members of the elite universities, it is, for the time being, the former case. The Dean of Harvard’s Faculty of Arts and Sciences described that body, already some ten years ago, as “a society without rules, or to put it slightly differently, the tenured members of the faculty — frequently as *individuals* — make their own rules [...]. there is no strong consensus concerning duties and standards of behavior.” Similarly, “MIT,” says the Dean of its Graduate School,

has 950 faculty members, and about 850 of them are entrepreneurs! They can and will do just about anything they want, if they can raise the money to pay for it. That is basically how it works<sup>14</sup>.

But at most other universities that is basically *not* how it works. Rather, “A shift from collegial to managerial forms of university governance has been widely observed as a ‘global’ trend.”<sup>15</sup> And indeed, when it comes to setting salary there is no distinction at all between the anarchic elite and the managerial mass: recent years have seen the growth of huge disparities in salaries of faculty at the same rank, and even within the same department, as entrepreneurial ideals and the concomitant disdain for solidarity have overtaken all alike.

As late as 1992, all professors at Uppsala University (except at the Medical School) had roughly the same salary. Now we have almost the same spread in salaries as in the U.S. This would have been absolutely inconceivable in Sweden, the home of social equality, ten years ago. Yet in less than three years it became totally accepted<sup>16</sup>.

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<sup>13</sup> MARCUSE, H., *One dimensional man: studies in the ideology of advanced industrial society*, Boston: Beacon Press, 1964, p. 103.

<sup>14</sup> Robert Rosenzweig quoting Harvard’s Henry Rosovsky, and MIT’s David Litster, both in Irving Asher, et al., eds, *The future of the research university: proceedings of an international workshop...1999*, Jerusalem: Israel Academy of Sciences and Humanities, 2000, 116, pp. 153–54.

<sup>15</sup> Currie, Jan and VIDOVIČ, Lesley, “Centralisation and Devolution through Corporate Managerialism in American and Australian Universities”, Paper Presented to the Australian Association for Research in Education, 30 November – 4 December 1997 (available at <http://www.aare.edu.au/97pap/currj123.htm> opening sentence).

<sup>16</sup> Thorsten Nybom, in the proceedings of the 1999 workshop on the future of the research university cited above, p. 98.

The significant point here is that these disparities are determined by market mechanisms only. What we have lost in the transition from principled modernity to utilitarian postmodernity is the obligation to reward in accord with merit — or, as Harvard's Dean would say, “to put it slightly differently,” in postmodernity merit is whatever a market, or a Dean, chooses. Modernity's concept of merit as something real, objective, ascertainable by due-process mechanisms at the center of which stood discipline-directed peer review is today on its last legs. “The general attitude that you just do your work is completely out of date,” observes physics Nobel Laureate Daniel Tsui, who has had to overcome that attitude both as Chinese-born and as modernist-educated; “if you don't toot your horn, no one will do it for you.”<sup>17</sup>

Like our top-down CEO-centered corporations, scientific institutions will become the sites of repeated reorganizations, dictated from above with no, or no meaningful, consultation with their scientific staff, and conceived in disregard of — indeed, more often as antithetic to — disciplinary divisions of knowledge. Those reorganizations will spring from the wholly taken-for-granted postmodern presupposition that the organization of research, and of knowledge too, has no inherent direction or structure, but is freely definable and redefinable just as the utilities of those possessing power might lead them to think or to wish.

And this brings us back to *Dilbert*. The features of the postmodern corporate workplace underscored by Scott Adams must inevitably increasingly characterize the scientific workplace as well. First is the disappearance of occupational solidarity in our hyper-individualized society. As Tsui's observation indicates, this development, long manifest in the decline of labor unions, has overtaken the scientific workplace as well.

Second, and more important, is the end of science as a calling. This renunciation of work as a site of self-realization is, on the one side, simply the inevitable appearance in scientific life of the life-meanings of the wider culture, the abandonment of the Calvinist-modernist exaltation of work for the private, personal, off-the-job sphere of family and romantic consumerism. But in science as in society at large, that choice is by no means entirely unforced; the postmodern workplace is manifestly an unprofitable site for investment of one's self<sup>18</sup>. “Humiliation” is the title of the second chapter of *The Dilbert Principle* (the first is devoted to the statement of that principle) and Adams is slashing in satirizing postmodern management's devices for depressing their employees's self-esteem:

The best balance of morale for employee productivity can be described this way: happy, but with low self-esteem. [...] Over the years, businesses have developed a broad

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<sup>17</sup> As quoted in *Science*, Nov. 10, 2000, 290, pp. 1075–76.

<sup>18</sup> An alternative scenario, offered by cybertechnically expert dystopic sci-fi writer Vernor Vinge, “Win a Nobel Prize! Wealth, chicks, guys, the secrets of the universe — they can all be yours,” *Nature* 407, Oct. 12, 2000, p. 679, has the great bulk of scientists effectively enslaved: “something we call ‘specialist fugue state’. When applied to a researcher, it creates an idiot savant, without life beyond short-range research goals.”

range of techniques to bring ‘employees’ self esteem back into the ‘productive zone’ without sacrificing happiness<sup>19</sup>.

If we postmoderns tolerate this, if we disdain the labor unions which, traditionally, have taken the maintenance of worker self-esteem as one of their most important functions, it is because we have turned our backs on work as a calling, as a vocation, as self-realization, and have instead put all our eggs in the market basket.

How can I know that the future will be just so? I know because the future arrived early at the Smithsonian Institution. That institution, exposed far more directly than are universities to the winds of romantic market populism, and lacking the sea-anchor that slows the universities drift — namely the requirement that those issuing from the doors of the university have acquired some competence in something — the Smithsonian has been ‘blown away’. The Institution’s leaders have taken full advantage of the postmodern freedom to define and redefine the purposes of the institution and transform its character, with no better warrant than possessing administrative authority to do so. The story of the Smithsonian in recent decades is, first, the undermining of the institution’s scholarly integrity by administrators who, though themselves products of the university and schooled in the academy’s absolutes, found their interests better served by the utilitarian relativism of the postmodern political milieu. But the wanton destruction of the Smithsonian as an institution aiming to create something better than mass market culture has awaited an energetic head, heedless of history, committed to the fullest exploitation of our romantic market populism with the intent of making ‘The Smithsonian’ America’s number one cultural brand.

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<sup>19</sup> Adams, *Dilbert principle*, 1996, pp. 18-19.