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**Higher Superstition: The Academic Left and Its Quarrels with Science** by Paul R. Gross & Norman Levitt. Baltimore: Johns Hopkins, 1994. 328 pp. $25.95 (c).

Quarreling with science comes easily to proponents of unorthodox claims. Enthusiasts of cryptozoology, parapsychology, Velikovskian catastrophism and many other such intellectual mavericks have occasion to think that mainstream science stands in need of correction on a number of larger and smaller matters. Higher Superstition does not, however, concern itself with such arguments about specific facts or theories; it reports and analyzes the quarrels of those who attack science *itself*, who assert the very search for objective knowledge to be illusory. The truth, under this view, is not the same for everyone: feminist truth, male truth, indigenous-peoples' truth, Afrocentric truth, and so forth are all different from one another–and at least equally true. Feminist science or Afrocentric science comprise different knowledge than does white-man's science.

Philosophers and sociologists know this type of critique as relativism or solipsism, espoused at different strengths by various groups throughout recorded history. Contemporary humanists know the attitude as deconstruction or post modernism. Historians will recognize this radically fundamental revolt against science as Romanticism, which has captivated intellectual elites more than once since the growth of modern science began: in the early 19th century as a drawing away from Enlightenment rationalism; toward the end of that century, in reaction to the growth of scientism; and in the 20th century, Romantic or Neo-romantic attitudes can be discerned in Fascist and Nazi doctrines, in the Leavis-style attack on C. P. Snow's exaltation of the scientific culture, in the contemporary New-Age fads, in what Gross and Levitt term "the academic left."

Scientists and engineers, on the other hand, may find it difficult to swallow that well educated people could have such beliefs, let alone act upon them, let alone that such beliefs and actions could constitute a danger to science and society. Gross and Levitt want to help us swallow this unlikely fact, that though we may live in a scientific and technological age, our intelligentsia is nevertheless pervaded by antagonism against science.

Where exactly do these attacks on science arise? Among those social scientists who maintain all human knowledge to be *purely* a social construction; among post-modernist literary types; among radical feminists; among fanatical ecologists; among extremists of AIDS activism, animal-rights, and Afrocentricity. What do these groups have in common? "[N]ot a self-consistent doctrine . . . . a shared sense of injury, resentment, and indignation against modern science" (5); "open hostility toward the actual content of scientific knowledge

and toward the assumption, which one might have supposed universal among educated people, that scientific knowledge is reasonably reliable" (2); the presumption that "the moral authority with which the academic left emphatically credits itself. . . [is] sufficient to guarantee the validity of the critique" (6).

Chapter 1 of the book is by way of introduction and justification of the usage, "academic left": the authors recognize that it is not self-explanatory. It serves their intent better, they feel, than such possible alternatives (37,260) as "post modern" or "post-Marxist" or "hyper-theoretical" left or "New Rage academics." The academic left's icons are the likes of Marx, de Beauvoir, Foucault, Derrida. Its rhetoric resounds with "discourse," "cultural," "practice," "inscription" (40). Its obscurity of meaning and indigestibility of prose are illustrated by copious quotation (39, 46, 63, 102-103, 144, 147, 192-93, 198-99). These quotes are quite essential, because people who have not paid much attention to the New Rage academics might otherwise doubt the prevalence of such unlikely beliefs as that "Western paradigms have been effectively demolished" (38) together with "faith in the omnicompetence of theory . . . [while claiming] to abhor 'totalizing' theories" (39).

Chapter 2 is a contextual synopsis of science as one strand–an inseparable, central strand–in the crystallization of the modem Western Weltanschauung: the "intellectual self-assurance that derives largely from contemplation of the well-confirmed triumphs of eighteenth-century mathematical science" stimulated social science, though the latter's "urge to prescribe, as well as to describe and predict . . . [is] quite uncharacteristic of physics itself' (18). Social thought predominantly came to associate "a more 'scientific' social order with a more egalitarian one" (22). The skeptical, empirical, logical approaches "that have matured for the most part in a scientific context" were invaluable weapons "against intellectual authoritarianism of all sorts, not least those that sustain social systems based on exploitation, domination, and absolutism" (24). Science, in other words, went hand-in-glove with leftist social goals. Why has the academic left now turned against science?

Partly out of disappointment and frustration that socialist ideals have not been realized, that leftist proposals have failed or been rejected: as an integral part of society's power-structure, science too must be in some way to blame for that. Partly too there is the legacy of the 1960s and 1970s, with their assumption that "the oppressed are endowed with uniquely privileged insights and that the intellectual as well as moral authority of victims is beyond challenge" (40): science must be denounced and rejected whenever it might gainsay the wishes of victims.

Chapter 3 dissects the current infatuation with "constructivism" of knowledge, the notion that knowledge is always and just a matter of social interests, negotiation, power, politics. Starting with the incontrovertible fact that those factors influence all human beings, the social constructivists then proceed to write and talk as though nothing else influences human knowledge, most particularly not anything that has an absolute reality in an external world. The

constructivists ignore the fact that if they are right in this, then they should have nothing to say: their claims to identify interests and negotiation are based, just as are the claims of science about Nature, on evidence and reasoning that they expect others to agree to. The unacknowledged logic of the constructivist attitude would point to force as the only way to settle human disagreements–consistent, of course, with the academic left's penchant for disrupting meetings at which there are speakers of a different viewpoint. "[C]onstructivism . . . is . . . relentlessly mechanistic and reductionist . . . . all are puppets of the temper of an age . . . . Only the cultural constructivists themselves (of course) are licensed to escape the intellectual tyranny of this invisible hand. . . . Typically, in the face of all-out challenges from scientists and philosophers . . . they edge away from the strong version of the constructivist claim . . . a different audience, one primed to hear science contextualized, relativized, and revealed as the deformed offspring of capitalist hegemony, the constructivist claws come out once more" (56-57).

The constructivists are "a particular breed of historians and sociologists of science . . . [who] spin perverse theories . . . [that] often. . . escape mere inaccuracy and rush hell-for-leather toward unalloyed twaddle" (43); as, for instance, "[i]t was no longer conceivable that nature could be reconstructed as a logical whole. . . . incompleteness, indeterminacy, arbitrariness . . . reappeared in the natural world" *as commentary on Einstein's theory of relativity* by a sociologist (46). Among the constructivist discourse demolished here is that of Bruno Latour, Stanley Aronowitz, and Steven Shapin and Simon Schaffer in *Leviathan and the Air Pump* which "the ideological perspectives of its authors make[s] . . . an exercise in tunnel vision" (68). Yes indeed. I learned how ignorant of the actual practice of science is Shapin's view, how determined by preconception, when in a seminar apropos of the book he remarked that scientists fail to value their technicians properly! When in truth we worship them and do anything we can to keep them happy.

"The Realm of Idle Phrases," Chapter 4, deals with post modernism, literary theory, cultural criticism: "more a matter of attitude and emotional tonality than of rigorous axiomatics. . . . a negation . . . of themes that have reigned in liberal intellectual life of the West since the Enlightenment"; "all knowledge projects are, like war, politics by other means," this dogma holds (71-72). But again, what has this to do with "left"? John Diggins has the answer: "Having lost the confrontation on the streets in the sixties, they could . . . as English professors in the eighties, continue it in the classroom. . . . Everything wrong with modem society would be explained no longer by the mode of production but by the mode of discourse" (76).

The guru Derrida exemplifies the post modernist willingness to talk balderdash about science: "The Einsteinian constant [c, the speed of light in vacuum] is not a constant, not a center. It is the very concept of variability" (79). Through more than 30 pages of chapter and verse, Gross and Levitt show that the writings of other post modernists about science are fully as ignorant and

silly as Derrida's, with "arrogance . . . comparable to that of 'creation scientists' in addressing evolutionary biology." Yet, they point out, "these intellectual misadventures are so well received in nonscientific academic circles, especially on the left . . . that they provide the route to publication, tenure, reputation, and academic authority for a growing body of would-be scholars" (106).

Under the rubric of feminism, too (Chapter 5), such arrogant pronouncements by ignoramuses of science are published with similar ease: in the university library of one of the authors of *Higher Superstition,* 143 items on "science and feminism" were *on the reserve reading list* for undergraduate courses *during the summer vacation.* That literature contains such gems as the psychoanalysis of mathematical rhetoric which is supposed to contain things like "If you torture the data it will confess" (115). Gross and Levitt get to the core in remarking that "[m]etaphor mongering is the principal strategy of much feminist criticism of science . . . to accomplish what analysis of actual ideas will not" (116).

*Higher Superstition* plays very fair, critiquing not some obscure easy target but the highest eminences; in feminist science, for example, Sandra Harding, Donna Haraway, Evelyn Fox Keller. Harding's insistence that physics is *not* "analytically separate from social life" is juxtaposed with the similar insistence of such racists as Philip Lenard of "German physics" infamy, who maintained that "[s]cience, like every other human product, is racial and conditioned by blood" (129); both are diametrically opposed to the long-standing aims and views of scientists–the Mertonian norms of universalism, communality, objectivity, disinterestedness. Just as rank pseudo-science often cites other pseudo-science, so Sandra Harding accepts without question the absurd Afrocentrist claims of Ivan Van Sertima and Hunter Adams; and the book in which she does so is praised *for that* in a review by another science-feminist (212). In this topsy-turvy academic wonderland, what matters is not *what* you know but *who you are.*

Another feminist guru, Evelyn Fox Keller, is demonstrated (137-142) to be to science as was Goethe: Romantic; which, as one of my students aptly put it, is the converse of scientistic. Helen Longino, yet another of the "big names," is cited: "One of the tenets of feminist research is the valorization of subjective experience"–if your gut feeling is different from what science discovers, in other words, your gut feeling is equally valid. Perhaps this juggling of long words strung into Germanic sentences is an unconsciously deliberate device to hide from outsiders what these people are saying to one another. If someone were to say, "Whatever a woman feels or believes is *scientifically* valid and valuable," almost everyone would guffaw; but not many people want to take the time to consider what "the valorization of subjective experience" actually *means.* "Science as-it-is becomes, for such critics [as Keller], an intolerable constraint . . . . To radical feminists as to dreams of teleportation and transluminal space-travel, it represents abhorrent limits" (147). [Which reminds me

of the constructivist Andrew Pickering, when I tried to have him admit that Nature constrains scientific knowledge: his response was that he hates that word "constraint."] Affiliated as I am with a "science studies" center, I blushingly and reluctantly confess the truth of Gross and Levitt's remark that feminist science is honored in that academic community; even though the feminists *have not yet produced a single item of evidence* in support of their claim that specific women's understanding would produce alternative scientific knowledge of specific matters (135). All elements of the academic left join in environmental extremism (Chapter 6), seeing destruction of Nature as resulting variously from "the hegemony of patriarchal values" or a "dialectical crisis of capitalism" or "a discursive practice that objectifies the natural and robs it of agency." They proceed "by selection of appropriate results from scientific journals . . . and . . . ignoring inconvenient ones" (151). But were it not for science, *Higher Superstition* points out, we would not know that the ozone layer is thinning or that carbon dioxide is building up; "work with alarmist or apocalyptic implications" is accepted willingly, but not "scientific work that confutes or modifies alarmist theories" (163). "As with biblical millenarians, objections of logic and fact have little effect. . . . [They are] convinced that the world is in calamitous decline. . . . [and] that ultimate retribution is on the way. Evidence to the contrary is viewed as a terrible letdown, not as a reprieve" (164). [In this connection, recall the classic *When Prophecy Fails* (by Leon Festinger, Henry W. Riecken & Stanley Schachter, University of Minnesota Press, 1956)–the failure gets explained away by the true believers, their belief is not swayed.]

Chapter 7 considers several "Schools of Indictment": AIDS activism, animal-rights movements, and Afrocentrism, which is another instance of the "tribalism . . . [that] is the most-favored project of leftist ideologues who . . . have abandoned . . . the universalism that once shone through even the dreariest left-wing cant" (203).

In Chapter 8, Gross and Levitt try "to comprehend why such shaky doctrines have been embraced so enthusiastically by individuals who are by no means stupid and who have often . . . made penetrating analyses in other areas of social and political thought" (217). Their most general answer is, human nature: as sages over the millennia have known, human reason has a tendency to fall asleep, and the sleep of reason brings forth monsters. More specifically, antagonism toward science is bred by the very success of science, because science is bound inextricably to Western society, to its *flaws* as well as to its successes. The very moral posture that condemns the injustices of Western civilization is itself Western; but to recognize that would cut off dreams of instant utopia, would acknowledge that the only path to social improvement is more Western-style progress–hard and slow, melioristic reform rather than revolutionary. So impatient people become Romantics, radicals, revolutionaries; and as they reject Western bourgeois culture they must reject science too, because those are part and parcel. But to reject science it is not enough to label it dan-

gerous, that would leave it powerful through being true: to reject science altogether, one must paint it as *false*. So the academic left finds itself with the bedfellows of constructivism, relativism, solipsism, absurdity.

Any attempt to describe, analyze, and find remedies for so pervasive a cultural motif as *Higher Superstition* examines must inevitably leave many details inadequately argued or questionable. In addressing a few of these, I intend to be constructive, to make the book's essential case as conclusive as possible to as wide an audience as possible. Though I beg to differ from Gross and Levitt on several points of substance or taste, I endorse wholeheartedly their concern over the intrusion of politically motivated intellectual rubbish into academic and public intercourse.

Small technical quibbles include a blurring of science and technology, especially in Chapter 2; and the unqualified statement (2) that "scientific knowledge is reasonably reliable": that is true only of *well-established, textbook-type* scientific knowledge, not of the results from frontier science that make almost all the news and public controversies about science (see my *Scientific Literacy and the Myth of the Scientific Method,* University of Illinois Press, 1992).

Gross and Levitt seek to focus their thrust specifically and solely on ideological critiques of *science* and to avoid speaking to the quarrels about the literary canon, about affirmative action, about self-segregation of minorities and women, in other words about "political correctness" (PC). Yet the groups who comprise their "academic left" are also those who most practice PC. To my mind, the connection is not fortuitous, the underlying motif is the same: dogma about what the "good society" must be, frustration that others don't see it that way, rejection of Enlightenment tradition and ideals, belief that ends are justified by means. It is fine strategy for Gross and Levitt to seek to combat ideological non-sequitur strictly on issues of scientific knowledge, because there the evidence is so clearly compelling to any disengaged observer. But, as they recognize, the academic left seeks to avoid that through *"moral one-upmanship*. If you decry the feminist critique of science, you are guilty of trying to preserve science as an old-boy's network. If you take exception to eco-apocalyptic rhetoric, you are an agent . . . of the greed of capitalist-industrialist polluters. If you reject the convoluted cabalistic fantasies of post modernism, you are . . . in the grip of a crumbling Western episteme . . . a failing white-male-European hegemony" (8). That is indistinguishable from PC practice. So is that "[n]ew candidates for veneration–writers, artists, musicians, philosophers, historical figures, non-Western 'ways of knowing'–are put forward not for what they are but for what they are *not* –white, European, male" (27).

At several places, Gross and Levitt take pains to disavow a conservative credo; in a few, they seem to bend over backwards to display sensitivity, for example over "the reality of women's exclusion from science" (12, 227). This sort of phrase does come easily to all our tongues nowadays following its use *ad nauseam* by the PCers, yet the *fact* of the matter is only the relative *absence* of women from science. "Exclusion" implies much more than that. It hints,

not that the traditional division of labor in society led to the relative absence of women from many fields including science, but that something about science specifically excluded them; moreover, by the wishes of men as against the wishes of women. Now I will not claim that we understand precisely why modem science got its start in 17th-century Western Europe, but the answer is likely to include such plausible suggestions as the monotheistic concept of a single God transmuted into that of a single set of immutable laws of Nature; the specifically Protestant rejection of authority and emphasis on individual reasoning; the coming into being of invisible colleges that became scientific academies and societies. Was not the gendered division of labor part and parcel of all that, of the society in which science first flourished? I'm not suggesting, mind, that the same division of labor would now have whatever utility it might have had earlier; but I do suggest that we not denigrate the society out of which our own developed. That past gave us our present ideals, including that of universal suffrage, and the present in which there is continual enlarging of the scope of the opportunities for everyone irrespective of gender. Science, like other professions, is now wide open to any woman of ambition and ability. It's time to stop whipping this long-dead horse. It's bad history to blame the past using present-day standards. It's very bad history to imply that we could know what presents would have been wrought by other pasts. (The perhaps excessive sensitivity *Higher Superstition* displays toward women may however have high strategic value: the book cites against the extremist science-feminists, able debunkers who are themselves feminist women.)

A point of special interest for readers of the *Journal of Scientific Exploration* is the assertion that "the indulgence of one kind of heterodoxy betokens a further susceptibility to eccentric or highly speculative ideas" (224). Certainly we all know people to whom that seems aptly to apply. Not so much, though, among members of the Society for Scientific Exploration, most of whom would seem to be indistinguishable from people of the mainstream except in their enthusiasm for *one* pet unorthodoxy. It is also far from uncommon for the most successful scientists to owe their achievement to unorthodoxy–being ahead of the herd–*on one strictly limited matter*. Perhaps it is more among non-scientists that *omnivorous* credulity tends to creep in through even a single chink in one's armor of orthodox rationality. However that may be, Gross and Levitt's book underscores the importance for anomalists to remain *scientific* even as they criticize specific theories, interpretations, and actions of specific scientists.

Gross and Levitt are right to remark on the "totalizing" penchant of the academic left, trying to force everything into the grasp of its theories. But they miss the opportunity to mention the same penchant–scientism–among prominent representatives of Establishment Science who insist that everyone accept the contemporaneous conclusions of science, be it that "evolution is not a theory but a scientific fact" (Stephen Jay Gould, Carl Sagan, and others) or that Congressmen must be ignorant not to support the Superconducting Super-Col-

lider (Leon Lederman). The arrogant hubris of such pronouncements can help to make attacks on science appear well deserved. Higher Superstition is a book of cultural criticism in the proper sense: an analysis of the modes of thought (or anti-thought) practiced by prominent parts of our society. And these are dangerous, Gross and Levitt insist. Among the dangers are that of crying wolf too often, ignoring "that there is an important difference, in science, between a hypothesis and a justifiable conclusion; and . . . between a justifiable conclusion and a public policy. . . . moreover, all conclusions, especially about complex systems, are temporary" (163). The attempt to find treatment for and prevention of AIDS is hindered rather than helped when would-be activists blather that they "prefer to speak not of 'persons with AIDS' . . . but rather of a 'society with AIDS'"; "each of us is living with *AIDS*" (192). Students have been intellectually maimed by indoctrination into fantasies of Afrocentric melanism (209).

In some academic departments and from the richest charitable foundations (237), high honor is gained by promulgating pseudo-science that Gross and Levitt show by quotation to be at the same level as cargo cultism. Thus there is hubristic piffle of the sort that Immanuel Velikovsky indulged in, from Sandra Harding: "we would have to reinvent both science and theorizing itself to make sense of women's social experience" (132). Unanswered nonsense tends to become conventional wisdom, this book reminds us; and we have indeed seen it in these politically correct days.

The greatest dangers, Gross and Levitt suggest, are to the humanities and the social sciences and to the education in science that responsible citizenship requires. "[A]ctive and interested citizenship . . . requires . . . a seat-of-the-pants ability to track disputes concerning science and public policy. . . . the responsibility. . . lies principally with the university. . . . [to ensure that] whatever is labeled as 'science education' in our colleges and universities *deserves* that designation. . . . If an aspiring scholar is to be judged on work affecting to make deep pronouncements on questions of science, scientific methodology, history of science, or the very legitimacy of science, it strikes us that scientists should have some say in evaluating it" (244-55).

Paul Gross and Norman Levitt show full awareness of the radical nature of this proposal, and full sympathy for the traditional live-and-let-live of academe in which only specialists evaluate each other. But they "have had to abandon the complacent feeling that the republic of intellectual inquiry is secure from internal decay" (257). They want to alert the scientific and technical community; and they warn humanists and social scientists that an aware scientific community and an aware society will not long countenance their disparagement: "The humanities . . . are indispensable to our civilization . . . . The indispensability of professional academic humanists . . . is a less certain proposition" (242).

This is a thought-provoking work. With more than ten pages of references and 30 pages of specific notes, it should be infeasible for anyone to claim that

Gross and Levitt are tilting at windmills. (The ten-page index is useful with names, but much less so with themes.) The authors are biologist and mathematician respectively, also competently read in the history and philosophy of science. Though the book is not light reading, it is very well written; nowhere could I detect that it is a joint work rather than that of a single mind. There are many fine turns of phrase, as absurdities and perversities of the "academic left" are described in a tone of disciplined outrage: disciplined because the authors distinguish scrupulously between thoughtful analysts and mad-cap activists, between warranted concern and dogmatic fanaticism. Thus Peter Singer is recognized as the originator of moral argumentation for the rights of animals but not held responsible for the verbal and physical terrorists who claim to be acting in the cause of animal rights (197). Be Gross and Levitt largely right or largely wrong in their analysis, their book ought to be read by everyone interested in knowing what academic society is saying these days. If the authors' apprehension is only partly warranted, that is ample enough cause for concern.

*Henry H. Bauer*
*Chemistry & Science Studies*
*Virginia Polytechnic Institute & State University*
*Blacksburg, VA 24061-0212*

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**Perilous Knowledge: The Human Genome Project and Its Implications** by Tom Wilkie. London and Boston: Faber and Faber, 1993. 195 pp. $22.95.

Science progresses along multiple and intertwining paths, most of interest only to the strollers themselves, but occasionally an event crystallizes the attention of a larger population. Inevitably this focusing on one milestone overlooks the other byways, creating the impression that a control point has been identified, a crossroads where future directions will be determined with lasting implications. The Human Genome Project is just such a landmark. It has captured the public imagination as some great [ogre-or-savior] that will mark the [destruction-or-salvation] of the human condition—all may choose their preferred word in the bracketed pairs. The project is also viewed as a concerted, centralized, directed enterprise, often likened to the Apollo Program, as is the case at the start of *Perilous Knowledge,* written by a physicist-turned-journalist.

Unfortunately, the large-scale projects in physics or space exploration do not provide the right models. The Human Genome Project has given a focus to work that was in progress already and the ultimate sequencing is still awaiting