

Hoax and Reality

March 7, 2009

IN 1996, THE ACADEMIC JOURNAL *Social Text*, self-described as “a daring and controversial leader in the field of cultural studies,” published an article by physicist Alan Sokal in which Sokal argued that in quantum gravity, “the foundational conceptual categories of prior science — among them, existence itself — become problematized and relativized.” What did Sokal mean by this? In Sokal’s own words, “This . . . statement is utterly meaningless, but it sounds good in certain circles.” Sokal’s intent was to parody the post-modernist, relativist views of science that he felt were prevalent in *Social Text* and other like-minded academic venues, and to see if by speaking the language of proponents of these views, he could get his parody published as a serious academic paper. In short, “Transgressing the Boundaries: Toward a Transformative Hermeneutics of Quantum Gravity” was a hoax. Its acceptance and publication reverberated beyond the academic world to the front page of the *New York Times*. In fact, Sokal is a strong proponent of the rationalist view of science that his *Social Text* paper calls into question. His new book, *Beyond the Hoax*, presents the full hoax article, extensively annotated by the author. The remainder of the book is a series of essays in which he argues passionately and insightfully for the evidence-based reasoning of the sciences. (Sokal briefly addressed these issues in the winter, 1997 issue of *New Politics*.) He critiques, at length and with an abundance of examples, approaches to reality that hold all truth to be subjective, relative, and dependent on cultural norms and biases. Sokal’s motivations in raising these arguments go beyond the defense of his own intellectual turf. “I confess that I am an unabashed Old Leftist who never understood how deconstruction was supposed to help the working class . . . My concern,” he stresses, “is explicitly political: to combat a currently fashionable postmodernist/poststructuralist/ social-constructivist discourse — and more generally a penchant for subjectivism” which he believes to be “inimical to the values and future of the left.” Quoting Alan Ryan, he continues. “. . .The minority view was always that power could be undermined by truth . . . Once you read [Michel] Foucault as saying that truth is simply an effect of power, you’ve had it . . . But . . . large numbers of self-described leftists . . . have confused radical doubts about objectivity with political radicalism, and are in a mess.” He worries that “much of present-day scholarship marks . . . a retreat from real politics into careerism disguised as progressive politics.” A couple of cases, the first discussed by Sokal himself, will serve to illustrate the rationalist, objectivist view of science that Sokal defends with passion and conviction: Suppose I am asked to pick a number from 1 to 99,999,999,999. I claim to have a method for getting it right on the first try despite seemingly insuperable odds. If I then proceed to do so, it gives my claim enormous credibility. If others claiming the same method likewise get it right, or pick numbers clustering closely around the correct one — perhaps differing only in the last one or two places — it does not in a strictly logical sense prove my claim is correct, but makes the case for it compelling, as our legal system would put it, “beyond a reasonable doubt.” This, in essence, is what happens when an experimental measurement of the electron’s magnetic moment agrees with what theory predicts to eleven decimal places. This outcome, as Sokal says, “would be utterly miraculous if quantum mechanics were not saying something at least approximately true about the world [and] . . . if electrons did not really exist in some sense or another.” The “method” for getting the right number in this case involves a dense web of prior evidence and reasoning including the assertions that subatomic particles called electrons exist and have very particular properties, and that their behavior is governed by the equations of quantum electrodynamics. Cut away now to a more macroscopic but equally miraculous prediction. Suppose I produce two agglomerations of wires, silicon, and other materials arranged in a minutely specific configuration. I then make the claim that when you press a particular sequence of buttons on the smaller of the two, the voice and image of Barack Obama making his acceptance speech will emanate from the larger. Some of the same principles — the existence of electrons and

quantum-mechanical reasoning about them — allow us to expect (predict) very specific outcomes when we use our TV remotes. The confidence that we can have that our modern electronic technologies will behave in particular ways, glitches notwithstanding, further reinforces our belief that the theories giving rise to these technologies are correct, at least to a very high degree of approximation, “beyond a reasonable doubt.” This, in brief, is the rationalist view of science, a view that prevails among the mainstream of its practitioners, and, as Sokal argues, a view that also informs the more mundane activities of plumbers and electricians, who routinely and without deep philosophic reflection use evidence and reasoning to draw conclusions about the presumably real state of your pipes or wiring. Sokal contrasts this with ideas that he labels postmodernist, acknowledging that he is using this term in a more limited context than is usual. Specifically, he is using the term to denote “an intellectual current characterized by . . . a cognitive and cultural relativism that regards science as nothing more than a ‘narration,’ a ‘myth,’ or a social construction among many others.” According to this view, as Sokal characterizes it, “‘truth’ is relative to some social or cultural group,” so that assertions about the social or natural world cannot “be objectively (and hence transculturally) true or false.” Most scientists acknowledge, as does Sokal, that scientific thinking can be influenced by the social and cultural context in which it takes place. But those scientists aspire to objectivity, and they impose stringent evidentiary demands on one another’s ideas to provide a basis for judging how closely those ideas correspond to an objective external reality. The insistence on what Robert Boyle called producibleness in the 1680 edition of his *Sceptical Chymist*, and indeed that very spirit of skepticism that Boyle espoused, lie at the heart of the successes of Western science. So Sokal argues vehemently against views which hold that there may be multiple and conflicting “truths” and thus “tend to reject objectivity even as an ideal towards which to strive (however imperfectly).” HAVING THROWN DOWN THE GAUNTLET against those who view truth simply as an effect of power, Sokal minutely details the ways in which he sees this relative view of truth to have negative consequences. His targets range from “creation science,” to which he devotes surprisingly little attention, to a range of New Age practices, to the rejuvenation of Vedic science by Hindu nationalists in India, to feminist science-criticism and ecoradicalism, and — more controversially — to several of the world’s main religions. In one of the more successful portions of his book, he takes the reader on a wild ride through the convolutions of New Age thinking. To a mainstream scientist, some of the most alarming come from the field of nursing. In the practice of Therapeutic Touch (TT), as described by its inventor Dolores Krieger, “the healer need not make physical contact with the patient . . . the work . . . has as its primary focus the modulation of the healee’s energy field.” Krieger, a nursing professor at New York University when she developed this practice in the early 1970’s, enjoined practitioners to assess the energy fields of pets and trees as well as humans. From eastern philosophies, she invoked the role of prana, a Sanskrit term for — in her words — “what we in the West think of as the organization of energy that underlies the life process.” In her evidentiary arguments, she took accounts in her students’ journals as “indications of the use of telepathy” resulting from TT. Other proponents of TT, lacking positive evidence either that human energy fields actually exist or that TT “healers” can sense them, assure their readers that “more definite proof will come from the process of TT, that is, the intentionality involved in the conscious desire to help or heal another.” Yes, and in James Barrie’s play, the children in the audience can save Tinker Bell by shouting, “I believe in fairies!” Martha Rogers, then the Head of the Division of Nursing at NYU, went further in her Science of Unitary Human Beings. Basic to her system were “energy fields, openness, pattern, and four-dimensionality Specifically,” she contended, “human beings and environments are energy fields.” Her four-dimensionality was “a nonlinear domain without spatial or temporal attributes,” in contrast to the Einsteinian notion of space-time. Having thus emptied the concept of content, she then asserted, “All reality is postulated to be four-dimensional.” The reader seeking some rigorous logical connectivity will hardly be reassured by her claim that “in a universe of open systems, causality is not an option” Though this reviewer is not qualified to judge fully whether these examples and quotes come from the mainstream or the fringes of the nursing profession, Sokal points out that in 1996, two

years after her death, the American Nurses Association inducted Rogers into its Hall of Fame, citing her as “a proponent of rigorous scientific study.” What are some of the salient issues here? In the rationales for these practices, concerns for evidence and causality are minimized or set aside entirely. Terminology is adapted from mainstream science, but here the concepts become too vaguely defined to admit of strict logical analysis, and the rigorous evidentiary demands of mainstream science are not present. It then becomes all too easy to make facile associations between concepts in, say, physics and concepts in eastern philosophies. The concept of prana, for example, is not the same as the concept of energy in Western science. It lacks the quantifiability that makes possible the prediction and verification of specific measurable outcomes. There may be analogous ways in which the terms are used, but analogies are all too easily overextended. This facile association between concepts from traditional cultures and those of modern science recurs in another context. Hindu-nationalist intellectuals have argued that modern Western science is oppressive and exploitative and that the Indian scientific mind needs to be decolonized, rejecting objectivity as illusory and instead accepting science as one of many “imperfect traditions.” Some “post-colonial” intellectuals have asserted that modern scientific discoveries are only re-discoveries of ideas in the Vedas, the ancient scriptures of Hinduism. Thus, the description of prana in Vedic cosmology — “It vibrated without vibrations” — is claimed to antecede Maxwell’s linking of electricity and magnetism in electromagnetic waves. As an extreme case, Sokal quotes an assertion that “the Vedas are a coded book . . . of particle physics and cosmology,” and that, for example, verses about wild and domestic animals are really referring to fermions and bosons. This loose free association is in contrast to what Nehru (quoted by Sokal) admiringly called “the adventurous and yet critical temper of science . . . the refusal to accept anything without testing and trial, the capacity to change previous conclusions in the face of new evidence, the reliance on observed fact and not on preconceived theory . . . the hard discipline of the mind.” But Hindu nationalists militated for equal time for such scripture-based “sciences” as Vedic astrology, and political pressures led in 2001 to the approval in principle of departments of Vedic astrology in Indian universities, with programs through the Ph.D. level. The decision, not surprisingly, was met with a storm of protest from Indian scientists, who in fact have made so-called “Western” science their own at a level that generates Nobel Prize winners. Although Sokal doesn’t pursue the comparison, American readers may see similarities here to the politics of equal time for creation science or intelligent design. Nehru’s few sentences are a nutshell summary of some of Sokal’s key ideas. Nehru’s stress on the “hard discipline of the mind” reverberates in Sokal’s defense of “the rigorous analysis of evidence” and his attack on critics of science who proceed from a lay understanding of the science they are addressing. “After all,” Sokal reminds us, “doing real science is *difficult* [emphasis added]. Why bother to invest the time to seriously learn physics, biology, and statistics if it’s all, in the end, just a matter of opinion anyway . . . your paradigm against mine . . . ‘one among many truth games’ . . . It’s a lot quicker, and more exhilarating as well, to erect a revolutionary system based on verbal manipulation of phrases culled from vulgarizations or popularizations of relativity or quantum mechanics.” He fairly bristles with indignation that “nowa-days a significant minority of humanist intellectuals feels entitled to pontificate on these subjects in spite of their ignorance,” and cautions that skepticism must be “informed skepticism.” It is partly on these grounds that Sokal takes issue with post-modernism, feminist science-criticism, and ecoradicalism, or at least with a substantial subset of those espousing these views. He stresses that he is supportive of both feminism and environmentalism, but objects strongly to non-scientists playing fast and loose with science ideas when they lack the depth of hard science understanding to assess their validity. He objects strongly as well to the unexamined premises from which some proponents of these “post-modernist” views proceed. How does any scientist, male or female, contend with an assertion that in the seventeenth century the “female world-soul . . . was murdered . . . by the mechanist re-visioning of nature” or French feminist Luce Irigaray’s contention that (in Sokal’s paraphrase) “fluid mechanics is underdeveloped with respect to solid mechanics because solidity is identified with men and fluidity with women”? At a time when shattering glass ceilings is resurgent in our national dialogue, it is

bewildering to find the stereotyping of sex roles creeping in as the premise of a feminist argument. Likewise, the premise of some radical environmentalists that pre-industrial humans lived in harmony with nature ignores evidence for ecological devastation and the hunting to extinction of various species even in Paleolithic times. But some radical environmentalists even question the importance of evidence. Geographer David Demeritt urges environmentalists to “end their search for foundational authority . . . in science or elsewhere, and appeal instead to diverse moral, political, and esthetic criteria to arbitrate between particular representations of nature . . .” “The universe,” Sokal cautions in response, “may not turn out to conform to our desires.” SADLY, THE BOOK AS A WHOLE FALLS WELL short of its most compelling arguments. Its tone, its length and repetitiveness, and flaws in editorial judgment will undermine its effectiveness as a persuasive argument for readers not already firmly aligned with Sokal’s views. In his preface, Sokal, never shy about his opinions, expresses “a visceral distaste for books . . . confected by pasting together a collection of loosely connected, previously published essays,” and then asks, “Am I not now publishing just such a compilation?” For Sokal, “The answer, of course, is no.” To use one of Sokal’s own recurrent phrases, this reviewer begs to differ. Either Sokal or his editors should have noticed that half of p. 346 characterizing religion as pseudoscience is repeated almost verbatim on p. 377. When Sokal writes, “At the risk of beating a dead horse, let us rephrase our critique . . .,” the reader may well moan audibly. The trouble is that most of Sokal’s chapters were previously published, and become painfully repetitive at times. Chapter Nine was not previously published, and Sokal is not embarrassed to tell us why: “This essay was originally commissioned by the journal *Science & Society*, but it ended up being more than seven times their maximum allowed length!” And yes, the exclamation point is his. The compulsion to include every case and every nuance at times weakens Sokal’s arguments. After acknowledging that he found many fewer examples than he had expected of postmodernists explicitly endorsing pseudosciences, he then goes on to discuss those examples in detail. Surely he is aware of how misleading it can be to focus on cases that are not representative of the overall distribution of evidence. The book’s footnotes are more than occasionally interesting, but their protracted use makes an already overlong book even more ponderous. The use of both footnote numbers and annotation numbers in the annotated hoax article and the embedding of annotation numbers within numbered footnotes is almost in itself a parody of academic writing. Yet Sokal’s preface praises his editor’s “courage” for not treating footnotes as the kiss of death for a book aspiring to some non-academic readership. The tone in the early portion of the book is also problematic. Scholars with whom Sokal agrees are “eloquent” and “brilliantly scathing.” Excerpts with which he takes issue are “hilarious” and “howlers”. He may be right, but dissing the opposition is no way to win converts. All this is unfortunate, because by the time you get to the best reasoned sections, sections that strike a more moderate tone and implicitly acknowledge that there may be intelligent readers who need persuading and are worth persuading, you think, “Why didn’t he say that earlier! And more succinctly!” And if you are a scientist in agreement with at least most of Sokal’s positions, you lament that his editors did not take a stronger hand in reining in some of his most unfortunate tendencies. There is an irony in this, because one of the recurrent objects of Sokal’s criticism was the failure of the editors of *Social Text* to exercise critical editorial judgment. In their case, of course, the failure of judgment was a far more crucial one — accepting the hoax article without referring it to referees with expertise in its scientific content. In contrast, consider how the editor of *Physical Review Letters*, a premier publishing venue for physicists, responded to a hoax article on a new force submitted by a young Yale professor in 1986. As recalled in the October 2008 issue of *Physics Today*, the editors sent back six reviews from referees (“one for each force”), all of which had in fact been produced in house. “Although all advise publication . . .,” Editor George Basbas wrote in the accompanying letter, “the Editors, in their usual arbitrary and capricious manner, do not come to this conclusion.” They were astute enough to respond to parody with parody. In fact, one wonders about the decision to begin the book with a fully annotated version of the hoax article, running to over 80 pages. When Martin Gardner did *The Annotated Alice*, it was clearly out of admiration for Lewis Carroll. When Sokal does an annotated Sokal — in which, among

other things, "I explain the various jokes and solecisms" — it can appear entirely too self-congratulatory. An annotation that reads, in its entirety, "I am very proud of this paragraph: it is elegant bunkum" does nothing to dispel this notion. For most readers, a few well-chosen examples of how the parody parodied and a briefer selection of quotes from the cited references would have sufficed. Overall, Sokal's book presents compelling intellectual arguments on both scientific and philosophical grounds for respecting the centrality of evidence and demanding a strong evidentiary basis for positions taken, whether in the scientific or social arena. I share his suspicion that "credulity in minor matters prepares the mind for credulity in matters of greater import." My major concern is that at times he argues not wisely but too well.