



The Sokol Hoax: A 25-Year Retrospective

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It is appropriate to commemorate the 25th anniversary of the publication of Alan Sokol's landmark discourse on the transformative hermeneutics of quantum gravity, but not for the reasons you might expect.

Twenty-five years ago, physicist Alan Sokol²¹ wrote the article “Transgressing the Boundaries: Towards a Transformative Hermeneutics of Quantum Gravity,” which was published in the journal *Social Text*.¹ Although Sokol refers to the article as a parody, it was bogus, plain and simple. It subsequently became known as the *Sokol hoax* and has taken a place in history alongside eminently forgettable literary ruses such as Clifford Irving’s phony autobiography of Howard Hughes² and a totally fabricated anti-Semitic rant called *Protocols of the Elders of Zion* that was published in the United States by Henry Ford in the 1920s.³ However, to equate the Sokol hoax with these others is a mistake of the

first order. Sokol’s was cerebral and enlightening for those who cared to invest the time to study and learn from it.

While much has been made of the theatrics of the hoax, too little has been made of the majestic way it engendered its nonsense and contributed to the scholarship on intellectual entropy. In my view, this article remains a worthy assignment for college undergraduates of any major and at all levels; it is useful as a measure of student tolerance of nonsense, willingness to admit self-ignorance, understanding the pathology of deception, familiarity with basic logic, and most importantly the ability to appreciate irony. The bottom line is that Sokol’s article can only be fully appreciated in the context of other social-psychological phenomena such as cognitive dissonance,⁴ right-wing authoritarianism,⁵ and partisan tribalism.^{6,7} The article should have been a wake-up call for all of us in the academy. But that’s not how it played out.

From a theatrical perspective, editors of the journal were awarded the 1996 Ig Nobel Prize for “eagerly publishing research that they could not understand.”²² While this was, in fact, what happened, too much has been made of this aspect. Academic journal editors frequently publish material that they don’t fully understand: that’s why they

WHICH OF THE FOLLOWING ARE MEANINGFUL? WHICH ARE TRUE?

1. All mimsy were the borogoves, and the mome raths outgrabe.
2. Colorless green ideas sleep furiously.
3. The present king of France is bald.
4. The Krebs citric acid cycle may be described as an intercellular energy wheel.
5. The natural state of all objects is rest. Objects will move only when some external force is applied.
6. The natural state for all objects is to remain in motion until some external force is applied.
7. Ptolemaic cosmology succumbed to Venerean disease.
8. The transfer of heat from hotter objects to cooler objects results from the flow of caloric fluid.
9. The boundary of a conformally compactified anti-deSitter space is itself a conformally compactified Minkowski space with one fewer dimension.
10. Derrida's observation relates to the invariance of the Einstein field equation $G_{\mu\nu} = 8\pi G T_{\mu\nu}$ under nonlinear space-time diffeomorphisms. The key point is that this invariance group acts transitively: any space-time point, if it exists at all, can be transformed into any other.

rely on peer review. While peer review is not infallible, it's the best way to detect deceptions that the academy has found so far. But far too much has been made of this side of the story. Unfortunately, the Sokol hoax became a hot-button issue for some noisy tribalistic scholars who circled their respective quasi-intellectual wagons and fired inward. The resulting acrimony distracted any casual observer from thinking about the implications of the deception.

As Sokol himself recognized,^{8,9} the more important aspect of the hoax is what it says about society and scholarship in general, and what it says has strong parallels with the absurdities that appear in social media, fake news sources, and trolling. It also shows how the digital world we are all a part of is actually creating a cosmic moral hazard by incentivizing people to engage in partisan forms of hoaxing, totally absent of cerebral foundation and purpose. In short, the Sokol

ruse should have shown all of us that even scholars are subject to the same psychological frailties as the rest of the population, even if to a lesser degree when it comes to fake news. That would have been a constructive exercise. But with our psychological deficits, we interpreted it tribally, undermining its effectiveness and purpose.

THE SOKOL HOAX

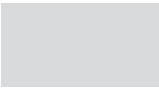
In Sokol's own words, the *Social Text* article was a parody "crammed with nonsensical, but unfortunately authentic, quotations about physics and mathematics by prominent French and American intellectuals."⁸ Sokol's primary criticism of postmodern intellectuals included their use of scientific concepts out of context and without justification and their epistemic relativism, the idea that all inquiry is a social construction of potentially equal value. In a sense, epistemic relativism is related to the phenomenon that Alexei Yurchak labeled

hypernormalization,¹⁰ the belief that everything is a delusion, so fake news is as real as the veridical. Filmmaker Adam Curtis has even made a documentary on the subject.¹¹ These two beliefs underlie a good part of the bewildering, confusing politics that we see today. Although Sokol, Yurchak, and Curtis are widely separated in background, time, and space, all three are on the same page with respect to a critical dimension of our human predicament: our incapacity to recognize and appreciate our intellectual limits and psychological deficiencies.

We illustrate this point with a simple experiment. I encourage any academics who read this to try it on their students. Which of the declarative sentences in "Which of the Following Are Meaningful? Which Are True?" seem meaningful? Which seem both meaningful and true?

Let's analyze these ten statements. We assume for present purposes that the meaning of at least one of the above statements is undeterminable on first reading. Which ones might they be?

1) is nonsense taken from Lewis Carroll's *Jabberwocky*, and 2) is one of Noam Chomsky's examples of semantic confusion embedded in what would appear to be a syntactically correct sentence. 3) is a sentence that expresses a failed definite description as nothing answers to the subject term. Some background in biology and astronomy is required to recognize 4) as meaningful, but it is. 5) expresses Aristotle's flawed view of motion, whereas 6) reflects Newton's correction of the same. 7) is a meaningful (albeit cutesy) truism that alludes to the flawed ad hoc patchwork of Ptolemaic astronomy that persisted for far too long, until Galileo recognized that it was impossible for Ptolemaic astronomy to account for the phases of Venus. Of course, 8) is Antoine Lavoisier's faulty account of thermodynamics, while 9) is meaningful and, based on our current understanding, is one correct solution to Einstein's field equations. However, 10) is Sokol's favorite example of fashionable



nonsense. For an explanation, we direct the curious reader to Sokol's own analysis.⁹ (As an aside, the interested reader may appreciate Andrew Bulhak's interactive postmodern fashionable nonsense online generator: <http://www.elsewhere.org/pomo/>.)

What may we make of this exercise? What we should take away from it is that it isn't always obvious which utterances are meaningful, much less when they're true. Before we get too carried away, we should embrace these facts as an intellectual challenge, not a problem. After all, such confusion justifies humanities' quest for knowledge in the first place. That was what the Enlightenment was all about: trying to sort truth from falsehood, sense from nonsense, meaning from absurdity. What Sokol did for us is rub our collective academic faces in the cavalier attitude we sometimes take when we attempt to recognize and express what we know. All knowledge is contextual and borrows on complex levels of interlocked understandings, and if we get any one of the putative understandings wrong, that part of our epistemological house of cards crumbles. Even some sensory experiences need to be understood contextually, e.g., the sensation of lukewarm is relative.

The beauty of modern science is that it is predicated on best evidence, not on faith, belief, superstition, or even absolute truth. When done properly, modern science does not require a specific belief system and is evidence based, continuously inspected for internal consistency, and self-correcting. Further, it should not and cannot be expected to produce absolute truths. When done correctly, science produces the best explanation consistent with observation at a moment in time, and science seems to be getting better at it. Should verified new observations undermine an explanation, a good scientist looks for a better explanation. That's what we should have taken from Sokol's example. The article was a reminder that the fragility of the human intellect requires us to avoid pitfalls

like overconfidence, pomposity, and intellectual arrogance. Unfortunately, too many focused on the phoniness of the article and the fact that it was published in a social science venue. These facts should have been seen as incidental to the true story.

SOKOL'S PARADOX

Sokol was objecting to a virulent form of cognitive/epistemological relativism that has pervaded postmodernist

the epistemological contexts and the ability to recognize appropriate contextual clues. These clues are the way that we relate semantic fragments to other things that we purportedly know or don't know. Of course, these clues may be our downfall, for if we don't know that we don't know something, the clues may poison our understanding. This gets to the heart of the Cambridge Analytica scandal, where the targets failed to recognize that



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thought, especially as it is contrasted with the rationality associated with the Enlightenment. Postmodernism is reflected in opinions like "the big bang holds that in the beginning there was nothing and then it exploded" and absurd positions like "this sentence is true for me." Anyone familiar with modern politics or who has taken a beginners' logic class in college has experienced such opining first hand. This historical context is critical to an understanding of Sokol's motives in publishing the parody.

As we showed, determining whether our sample sentences were meaningful depends on both an understanding and appreciation of context as well as a level of antecedent knowledge: an elementary school student might weigh them all as equally meaningless, but college graduates (we hope) would recognize that some are clearly meaningful and that even a few are both meaningful and true. In fact, the more prescient students could recognize that some statements seem incontrovertible. Therefore, we are obligated to recognize that one's ability to discern meaning in these statements is closely related, if not proportional, to one's understanding of

they were being played for useful idiots, but that's another story.

Further, as we move down our list, the requisite preparation increases until, probably, we get to 9), where adequate preparation is well beyond all but the most advanced students of physics. To explain this, we need to recognize that a mismatch between the intellectual preparation of the reader and the semantics of the sentence prevent any reasonable evaluation. We note that this is about knowledge and independent of any meaningful measure of intelligence.

This leads us to what I'm calling the Sokol paradox: we are imperfect instruments in determining whether we are sufficiently prepared intellectually to either make truth claims ourselves or interpret the putative truth claims of others. Put simply, humans, no matter how well informed, can never have perfect knowledge of what they don't know. As a consequence, the evaluation of strange statements is impossible in principle: they may be meaningless, they may be meaningful but false, or they may be meaningful and true. Absent perfect knowledge—which no one possesses—it's impossible for anyone to determine

as long as the statements are sufficiently strange.

Put another way, Sokol's paradox holds that no background knowledge is completely adequate for the semantic evaluation of all statements. Further, the knowledge required to assess the adequacy of the background knowledge may be of an entirely different kind than the knowledge required

would have been more productively spent focusing on a metalevel principle that I will call the Sokol paradox in recognition of his contribution. The editors of *Social Text*, and presumably the peer reviewers involved, made the very common mistake of putting too much reliance on their scholarly abilities. Social scientists will always be at a disadvantage in this respect due to the

age that chance favors a prepared mind is operative here, as is Ludwig Wittgenstein's remark that "even if all possible scientific questions have been answered, the problems of life remain untouched."¹² Even from a positivist perspective, social sciences are amenable to a broader range of interpretations than science and math. This does not imply that social sciences, or the arts and humanities for that matter, are less consequential; it is just that the standards and methods for judging quality are different.

Peer review only works well when the reviewer and author are relatively equally familiar with the literature, equally competent, and equally open-minded. That situation isn't always the case; in some contexts, from my experience, it's downright rare. I've recommended to several editorial boards with which I've been associated that a provision should be made for articles that are simply impossible to review adequately (Einstein's paper on special relativity would have fallen into this class) by just listing that the paper was recommended by some specific scholars who were willing to go on record as endorsing the contents. This "recommended by" approach could be a clear indication to all that the standard, external peer-review process was not followed but that the named authorities mentioned believed that the paper had merit. Had *Social Text* done that with Sokol's submission, much of the rancor might have been avoided.

This is not to deny that Sokol operated with a less-than-open agenda but rather a hostility toward the postmodern approach to scholarship in the social sciences, and he sought to take advantage of any perceived weakness in peer review in that arena. For this reason, his participation in the rancor must be admitted. However, the scholarly community read far too much into the hoax than was justified. The default editorial postures in science, engineering, math, humanities, and the social sciences are different. We should not find it to be surprising that some may be more tolerant of iconoclasts than others. If it

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to evaluate the statement itself. This is true within and between different disciplines and contexts. Disciplines naturally evolve toward complexity, so the level of understanding is proportional to, and in some ways limited by, education, training, and experience. This partially explains Einstein's failure to receive a Nobel Prize for his seminal work on relativity: at the time that his papers on relativity were published, too few of the academic physicists were able to appreciate its significance.

In a sense, some were in a situation similar to the imaginary students considering our list of statements. And this involves intradisciplinary considerations that pose even greater challenges. In principle, there is no reason to believe that any Nobel Laureate in physics will be able to understand and appreciate the significance of a paper written by a Turing Award recipient in computer science, and vice versa. As a mathematical physicist, Sokol should have been aware of this long before he wrote his parody. Unfortunately, in many ways, he chose to express this by means of his famous hoax that triggered the tribalism, and the tribalism detracted from an otherwise important point.

I am not discounting that Sokol's hoax was directed against postmodernists, but his critics seem to be fixated on the ruse when their energies

nature of their disciplines. In this respect, the physical sciences, computer science, engineering, and mathematics have an enormous advantage in that there are fairly well-defined rules, formulas, and algorithms that circumscribe our work. But that doesn't make science, math, and engineering more important, just more formal.

Perhaps computer scientists have been made more aware of that than other "hard" disciplinarians because so many of the subfields of our discipline (graphics, multimedia, digital videography) borrow on the arts. Many of us are open minded to the claim that the field of graphics is just as important to computing as, say, compiler design, but we recognized that both subdisciplines contribute to the overall effort in different ways. Misjudgments arise even in the most formal of disciplines. A case in point is the proof of Fermat's last theorem by Andrew Wiles in 1993. When first proffered, the proof was faulty. It took several years for Wiles himself to recognize how to correct the error. Over the centuries, hundreds of others have produced faulty proofs of the theorem that were not as repairable.

Therefore, in my view, the value of the Sokol hoax experience is that it shows the critical intellectual preparation required to recognize nonsense. Blaise Pascal's ad-

should turn out that the standards and practices of editorial review in the hard sciences makes Sokol-like hoaxes less likely, that is not necessarily and not always a good thing, for it may prevent unreasonable barriers to the best ideas if they've wandered too far away from the received views. Conversely, less formal disciplines that may be too accepting of ideas that are wrongheaded, fickle, or inconstant might also be more willing to admit breakthroughs. After all, not all of alchemy is absurd: the transmutation of elements underlies nuclear fission and fusion. We all need to accept that one cannot always anticipate enduring sources of enlightenment.

This new spin on the Sokol hoax, which we're calling the Sokol paradox, is the recognition that it is likely to be more difficult to know what we don't know than to know what we do. That's where Aristotle, Ptolemy, and Lavoisier went wrong: they failed to embrace the fact that they didn't know what they didn't know.

While we're on the topic, there is an interesting corollary to the Sokol paradox developed by author Michael Crichton. He named it the *Murray Gell-Mann amnesia effect*. His remarks are poignant and worth repeating here.

Briefly stated, the Gell-Mann amnesia effect is as follows. You open the newspaper to an article on some subject you know well. In Murray's case, physics. In mine, show business. You read the article and see the journalist has absolutely no understanding of either the facts or the issues. Often, the article is so wrong it actually presents the story backward—reversing cause and effect. I call these the “wet streets cause rain” stories. Paper's full of them.

In any case, you read with exasperation or amusement the multiple errors in a story, and then turn the page to national or international affairs, and read as if the rest of the newspaper was

somehow more accurate about Palestine than the baloney you just read. You turn the page, and forget what you know.

That is the Gell-Mann amnesia effect. I'd point out it does not operate in other arenas of life. In ordinary life, if somebody consistently exaggerates or lies to you, you soon discount everything they say. In court, there is the legal doctrine of falsus in uno, falsus in omnibus, which means untruthful in one part, untruthful in all. But when it comes to the media, we believe against evidence that it is probably worth our time to read other parts of the paper. When, in fact, it almost certainly isn't. The only possible explanation for our behavior is amnesia.¹³

Crichton describes a phenomenon to which we all succumb, on some occasions more than others. We have become accustomed to willingly suspending disbelief even in the presence of unmitigated nonsense and falsehood. The Gell-Mann amnesia effect agrees well with Aldous Huxley's observation that humans have a seemingly infinite capacity for distraction.¹⁴ Note that Crichton and Huxley's observations both compound and complement the Sokol paradox, for they combine to weaken any cerebral protection that one might reasonably apply to new unobserved and untested observations. In deference to Sokol, we will eschew any inclination to draw parallels to Godel's incompleteness theorem, which in this context is akin to Godwin's Law to online tribalists.¹⁵

The Sokol paradox holds that since at any particular level of knowledge there are statements that the observer is incapable of understanding, any observer may be expected to err in judging meaningful statements as long as he or she possesses imperfect knowledge of what he or she doesn't

know, which is always the case. Our claim is that if we take perfect knowledge to be both knowing precisely what we know and what we don't know, then perfect knowledge is impossible. (We leave the proof to the reader.) The fact that no one can ever achieve such a perfect epistemic state implies conservative judgment when it comes to evaluating scholarly work. But it does not imply suspending all judgment in these cases. The recognition that most knowledge consists of contingent statements that make science appealing and nonthreatening to the refined intellect sets it apart from dogmas of any form. Appreciating new inconsistent data are, for the most part, the life blood of science and scholars who view the study of noncontingent and unipolar claims as futile and barren. This is not to deny that all such claims are false: they may be what Wittgenstein called “degenerate propositions on the side of truth.”¹⁶

So, what are we to make of the Sokol paradox? The following consequences are worthy of consideration.

- ▶ We all are incapable of evaluating the veracity of all communications all of the time. This is an inevitable byproduct of the paradox. The only protection we have against fake news, <ALT>-facts, post-truths, weaponized digital propaganda, and the like is eternal vigilance.^{17,18} There is no escaping the fact that, absent perfect knowledge, mistakes in evaluating putative facts will be inevitable. The Cambridge Analytica scandal confirms this.¹⁹
- ▶ While the prestige of the source of information is an important factor to consider in evaluating content, it is fallible. Crichton's Gell-Mann effect makes that clear. No source is so reliable that everything contained therein may be considered

trustworthy and authoritative. There is no alternative to critically evaluating information from all sources. This has held true since the advent of written languages, but the influence of social media exacerbates the problems.

- › One must always be on guard for disinformation. Unlike misinformation, disinformation is manufactured specifically to confuse, disrupt, and manipulate. Some sources of disinformation are fairly easy to detect (especially egregious online sources), but others are not (shared social media feeds from friends). As Edward Bernays observed in 1928, “Those who manipulate [the habits and opinions of the masses] constitute an invisible government which is the true ruling power of our country.”²⁰ These manipulators will emerge in full force in the 2020 U.S. elections.
- › In a perfect world, Sokol’s deception and the Gell-Mann amnesia effect would have been taken as wake-up calls that reinforced the criticality of situational awareness and contextualization to understanding. Instead, the Sokol hoax was misinterpreted, and Crichton’s Gell-Mann effect has been largely ignored. The community of literati needs to do better.
- › Finally, and most obviously, we need to see that our experience with the Sokol hoax was entirely predictable given the human propensity toward tribalism. Whenever any of our sacred oxen is gored, there is something in our lizard brain collective that suspends rationality. There is no way to stop this, but we at least owe it to ourselves to be aware of it. ■

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