

The Two Cultures Revisited: Debates Between the Disciplines

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*Mathematics is about mathematics, poetry is about poetry
and criticism is about the impossibility of its own existence.*
—Robert Scholes

Beginnings

This is not a scientific paper. What follows is an analysis of the current state of affairs in an intellectual and political discourse between science and literary studies. As such, there are no figures, no plots or diagrams, no formulae or data tables. Though not directly important to physics research, this subject is extraordinarily relevant to the field of physics, its residence in the greater world of academia, and its contribution to a system of knowledge that includes many other disciplines. The intention of this project is threefold: (1) to detail recent and ongoing discussions regarding the ideological separation between science and literary studies, (2) to explore whether such a separation is irreparable, and (3) to discuss the consequences of this separation. The conclusions presented are not only open to debate but welcome it wholeheartedly. Debates between the disciplines serve to enhance our unique philosophies and generate new ideas; such is the hope behind the following pages.

A Problem Identified

In 1994, Paul R. Gross, University Professor of Life Sciences and director for Advanced Studies at the University of Virginia, and Norman Levitt, professor of mathematics at Rutgers University, published *Higher Superstition: The Academic Left and its Quarrels with Science*. The book identifies disturbing trends in the field of humanities studies, notably the increasing frequency of antiscientific attitudes. The desire to debunk positivistic tendencies in the natural sciences seems to have grown into a full-out attack on all scientific claims; postmodern philosophies and the ever-expanding realm of cultural studies have fueled a movement whose unstated goal is to strip the natural sciences of their ability to make substantiated claims about the world. If, as many of the academic left would seem to be suggesting, our knowledge of the world is created by sociocultural and metaphysical assumptions, then no scientific statement can claim to be more than a judicial interpretation of such assumptions. That is, modern scientific theories are reflections of the zeitgeist and do not represent any actual physical knowledge; they should be studied in much the same way that we would study racism or attitudes about gun control: as indications of our cultural or philosophical viewpoints, rather than depictions of objective truths.

Gross and Levitt respond with alarm to such beliefs. *Higher Superstition* illuminates what they consider to be a mounting attack on the sciences, one that deserves to be met not merely with disbelief but with an active defense. Though science has for the most part ignored these dangerous trends, Gross and Levitt suggest that such ignorance is no longer prudent; science must in fact rise to these attacks or risk its reputation. With this need in mind, Gross and Levitt proceed to enumerate various lines of thought perpetuated by the academic left which they perceive to be injurious towards the sciences. The most basic problem stems from ignorance: much of the academic left has taken to using scientific ideas and terminologies in support of their own theories, but they do so with little or no research into their actual meaning. Gross and Levitt provide example upon example of the misuses of scientific dogma, ranging from the mildly annoying to the glaringly stupid. With the ease with which they uncover such blunders, it would seem that scientific ignorance is not only

permitted but perhaps even encouraged in the academic left, an idea which Gross and Levitt find outrageous and disturbing.

Yet this is not the most dangerous element; more importantly, they uncover what would appear to be a fundamental distrust of scientific objectivity which threatens to raze all of science's accomplishments. Underlying much of postmodernism is the sentiment that an objective reality is a myth, that science is a self-referential, self-affirming system with no more ability to describe the world than tarot cards. Any reality which we perceive is really a construct, a derivative of assumptions which are themselves constructs of social or linguistic assumptions. Science is not capable of describing an external reality, but merely of affirming itself in terms of itself. Clearly these are devastating sentiments; the fact that they have existed for so long and matured into accepted and repeated theories among the academic left is a sign of a developing nihilism; this threatens not only to swallow the disciplines which embrace it, but like Frankenstein's monster, to escape its binds and destroy everything around it.

Gross and Levitt expose such dangerous tendencies in scores of postmodern writing, from literary and philosophical theories, to feminism, multiculturalism, environmentalism, and even AIDS activism. Particularly with postmodern literary and philosophical theories, they uncover an intensifying antiscientific drift, with consequences as yet unseen but certainly malignant. They perceive the shift from modernism to postmodernism to be, at least in part, a reaction to the qualities of scientific rigor. Postmodernism rejected (among other things) structuralist theories, theories which prided themselves in incorporating scientific methodologies into literary analysis. Gross and Levitt view the structuralist movement as indicative of a strong "physics envy"¹ on the part of the literati; in the hopes of gaining some of the respect and perhaps funds so readily available to the scientists, the academic left took it upon itself to integrate the concepts of scientific study into its own research. When this failed (that is, when structuralism was seen to be infected with a number of untreatable ills), the left then declared all scientific study to be irreparably flawed. That is, unable to raise literary study to the rigorous standards of scientific research, the left chose to treat such scientific standards with contempt. The result: text upon text which denies science's ability to describe an external reality and claims it to be just another discourse, no more or less valid than any other.

Particularly guilty of this crime in Gross and Levitt's eyes is French philosopher Jacques Derrida, whose theories heralded the end of structuralism, and whose concept

déconstruction became the foundation for much of poststructuralist thought. Gross and Levitt interpret Derrida's deconstruction as the notion "that truly meaningful utterance is impossible, that language is ultimately impotent, as are the mental operations conditioned by linguistic habit."² These are clearly dangerous and ridiculous ideas, and Gross and Levitt express both surprise and fear at their apparent popularity. They deride such theories as nihilistic and destructive, and call for them to be torn down.

Fortunately for their purposes, such a call is indeed heard and responded to. In 1996, physicist Alan Sokal submitted an essay titled "Transgressing the Boundaries: Toward a Transforming Hermeneutics of Quantum Gravity" to the popular postmodern magazine *Social Text*. Sokal begins with the statement:

It has...become increasingly apparent that physical "reality", no less than social "reality", is at bottom a social and linguistic construct; that scientific "knowledge", far from being objective, reflects and encodes the dominant ideologies and power relations of the culture that produced it; that the truth claims of science are inherently theory laden and self-referential; and consequently, that the discourse of the scientific community, for all its undeniable value, cannot assert a privileged epistemological status with respect to counter-hegemonic narratives emanating from dissident or marginalized communities.³

Sokal expected that the editors of *Social Text* would be sympathetic to such sentiments, and he was correct; they agreed to publish his essay. What follows this introduction, however, are pages of buzz words, an expertly arranged text which includes all the major phrases common to postmodern writing, as well as the current terms in modern physics, but which amounts to absolutely nothing; the text was a parody. To Sokal's delight, the editors of *Social Text* were unable (or unwilling) to recognize this, and their publication of the essay served to confirm Sokal's (and Gross and Levitt's) concerns about the academic left: namely, that misinformed, and frequently nonsensical, uses of scientific dogma as well as nihilistic theories were being encouraged and rewarded.

Sokal followed his hoax by teaming up with another physicist, Jean Bricmont, to publish *Fashionable Nonsense: Postmodern Intellectuals' Abuse of Science*. Both the title and purpose of the text echo Gross and Levitt's publication of three years prior. Narrowing the focus a bit, Sokal and Bricmont concentrate only on literary and philosophical theories, systematically analyzing the theories of Jacques Lacan, Julia

Kristeva, and Jean Baudrillard, among others. They don't directly attack Derrida (though Sokal does mention him in the "Quantum Gravity" hoax), but the criticism they levy against others runs along the same thread as that which Gross and Levitt use against Derrida: namely, that much of this writing is irrational and nihilistic, and needs to be expunged from the realm of acceptable discourse.

Given these two texts and noting their popularity (*Fashionable Nonsense* was a New York Times Notable Book of the Year in 1998), it would seem that there is rising distaste on the part of the natural sciences for the theories of the academic left. Four well-respected scientists have taken it upon themselves to reveal the absurd and potentially dangerous track which the literati appear to be stumbling down with increasing speed. The thrust of both texts is clear: such philosophies are inherently antiscientific and thus a threat to the sciences. Though the natural sciences have escaped from harm thus far, the probability of continued safety decreases as the attacks mount. Gross, Levitt, Sokal, and Bricmont all advocate greater attention to these ideas on the part of the scientists, and call for an organized and clear offensive: it is imperative that such ideas be revealed as nihilistic and nonsensical, and the responsibility for such uncovering falls to the scientists. This is a responsibility that ought to be taken seriously and needs to be approached immediately.

What these texts reveal most, beyond the debatable issues of postmodernist literary and philosophical theories, is the ever-widening gap between the humanities and the natural sciences. Both *Higher Superstition* and *Fashionable Nonsense* perpetuate the idea that there is truly no middle ground between the views of the academic left and those of the hard sciences, and that in fact the bridge between is longer and more treacherous than ever before. Frequent references are made to C.P. Snow's 1959 lecture *The Two Cultures*, in which he described the distance between the culture of literary studies and the culture of science. Snow bemoaned this separation, and alluded to the possibilities should the gap be lessened. He believed that such an occurrence was necessary for the industrial revolution to spread to impoverished countries, and felt quite optimistic that it was inevitable that the cultures come together, if only for humanitarian reasons. Both Gross and Sokal point out that what was once seen as inevitable is becoming increasingly less and less likely. Not only has the gap failed to shrink since Snow's lecture, it has apparently grown exponentially and shows no signs of decelerating.

What Gross and company fail to recognize is that they are in part responsible for the acceleration of the divide; the stated goal of their texts is to reveal much of

postmodernism as ridiculous, but certainly such insults will do nothing to bring the fields closer together. Both books are written with a sarcastic tongue, and the authors delight in making fun of the academic left at every possible turn. The titles themselves are derogatory, and the texts follow in the same vein. It would seem that the general rules for diplomacy have been forgotten here: when you call for a truce, you don't generally begin by insulting your enemy; you're much more likely to take a bullet if you go that route. As such, Gross and company should expect nothing but derision in response to their texts: surely this is not the best way to bring the cultures together.

In fact, Gross and Sokal exaggerate the divide and make it seem much larger than it truly is. They describe what they believe to be an impassable rift between the disciplines, a philosophical and ideological valley which can never be crossed. Though it is possible to dredge up evidence in support of this fact, there is also overwhelming evidence which points to the opposite: that the divide is in fact the construction of members on both sides, and not an inherent quality of the disciplines. Yes, if we search for disagreements between the cultures, we will find no shortage of them. But quite similarly, if we search for areas of commonality, we will find that the thought processes and ideologies on either side are much closer than previously believed.

With this goal in mind, the next section of this paper will focus on the doctrines of Derrida, both to illuminate some of the philosophies of postmodernism and to respond to the criticisms levied against it by Gross and Sokal. Derrida has been quite rightly termed the father of poststructuralism, and his ideas have had enormous impact on most postmodern theory. He can as such be viewed as representative of a significant majority of the academic left. An analysis of his ideas serves to explicate postmodern ideology as well as make clear the sources of such philosophies. Contrary to what Gross and Levitt believe, poststructuralism is no more a rejection of structuralism than quantum mechanics is a rejection of classical physics: both developments occur in response to problems with current theories, and both build off such theories as they modify them in lieu of new evidence.

Nonsense!

The “post” addendum to postmodernism and poststructuralism is somewhat misleading; it implies an aftermath, the shards remaining behind after a catastrophic event, like post-nuclear or post-WWII. The advent of poststructuralism was in fact nothing like that. The move in literary theory from formalism to structuralism to poststructuralism was an evolutionary trend; each theory developed from the prior. Though poststructuralism matured into a creature which seems to have spurned much of its predecessor’s beliefs, it was in fact born from and nursed by structuralism and could not have developed without such a motherly presence. The next few pages will attempt to elucidate this development and examine the impetus behind deconstruction, as well as the consequences it must face.

Structuralism developed largely out of the theories of Swiss linguist Ferdinand de Saussure. Influenced by the growing pressure for scientificity on the part of the human sciences, Saussure’s theories reflected a methodical and decidedly non-artistic approach to language. He defined language as a system, and then neatly divided that system into its constituent parts, focusing his research on how such parts interacted and performed. The structure of language, according to Saussure, depended on inter-word relationships. Previous linguistic theories were based on the assumption that there was a “word equals idea” association, that every term was a symbol for the idea or object it referred to. Saussure rejected this assumption, claiming that the connections between words and meanings were much less direct. Language is made up of signs, not symbols, and each sign, rather than making a simple one-to-one correlation with its referent, actually consists of two parts: the *signifier* and the *signified*.

In Saussure’s system, the *signifier* refers to the spoken or written word, and the *signified* to the idea or object which the word is meant to evoke. Thus, the marks on the page that spell the word “dog” serve as the signifier, while the animal referred to is the signified. An analysis of this system quickly reveals that the relationship between signifier and signified is entirely arbitrary. Other than convention, there is absolutely no reason why the letters “d-o-g” should be responsible for referring to the notion of a small, domestic animal. In other languages, various other words accomplish the same signification. That is, the words we use can make no claim to ownership of the ideas

they represent; they are signposts, pointing towards a referent, not symbols standing in the referent's place.

In fact, the process of signification is entirely self-referential. Words refer to other words, not to external meanings. This is not to say that such meanings are nonexistent, but that "meaning is not mysteriously immanent in a sign but is functional, the result of its differences from other words."⁴ That is, "dog" means "dog" because it is not "log" or "bog." A word has meaning only in the sense that it differentiates itself from other words. Whether such differentiation is phonic ("dog" as opposed to "log") or conceptual ("true" as opposed to "false") is irrelevant; so long as the word individualizes itself in opposition to all other words, its meaning is conserved. An example: ask for the definition of dog and you may get "furry, four-legged creature" or "small, domestic animal." Both statements rely on how the term dog differentiates itself from other terms: a dog is furry (not bald) and has four legs (not two or six); it is small (not large) and domestic (not wild or free). And it is an animal or creature, as opposed to a human or insect. This is by no means an exhaustive or complete description of a dog, but the point is clear: our understanding of the word dog depends entirely on the words and ideas that it stands in opposition to.

Structuralist criticism then focused on discovering such oppositions in a text and analyzing their development and function. This frequently meant locating binary oppositions inherent to a work of literature and tracing their use throughout the text. An example is Claude Levi-Strauss' interpretations of the Oedipus myth; he determines that "the general opposition underlying the Oedipus myth is between two views on the origin of human beings: (1) that they are born from the earth; (2) that they are born from coition."⁵ Levi-Strauss' analyses of Oedipus do not center on any narrative or symbolic issues; rather, he focuses on the structure upon which the meaning of the myth is founded. There is no direct denial of the importance of the narrative, or of any greater poetic meaning intrinsic to the story; instead, his analyses indicate a shift of focus, an attention now paid to the details of linguistic structure rather than the obvious literary surface.

This shift, though frequently interpreted as a break with earlier criticisms, was in fact the natural progression from contemporary theories. Formalist theories (or New Criticism) promoted the notion that a text's cultural, historical, and sociological influences and concerns were secondary to the text itself. Archibald Macleish, in his famous poem "Ars Poetica," summed up the New Critic bent with "A poem should not mean / But be," reflecting the initial move away from literary meaning and

towards textual existence. New Criticism primarily concerns itself with “how the parts of a text relate, how it achieves its ‘order’ and ‘harmony’, how it contains and resolves ‘irony’, ‘paradox’, ‘tension’, ‘ambivalence’ and ‘ambiguity.’”⁶ Structuralism emphasizes the same thing, but more systematically. Essentially, structuralism took the ideas of New Criticism and solidified them, explicating the critical process with linguistic concepts.

Structuralist theories also built on and strengthened the formalist notions of authorship. The intention of the author, already relegated to secondary status in formalist critiques, was now refused any relevance whatsoever. With the advent of structuralist theories, a slow poisoning of the author’s authority begins, to be completed with poststructuralist theories a decade later. Structuralist criticism didn’t concern itself with what a writer was *trying* to say, or even with what he or she did manage to communicate, but rather with the means by which such communication was achieved: Saussure was “not interested in investigating what people actually said; he was concerned with the objective structure of signs which made their speech possible in the first place.”⁷ That is, it doesn’t matter that *Hamlet* speaks to us about the obligation of revenge; what matters is how the sign that refers to such an obligation is constructed and utilized, and which signs it opposes itself to.

Structuralist theories then marked an altering of the priorities of a text. Given Saussure’s theories, it becomes clear that at its root language is unable to refer to anything other than itself. Each word can only refer to another; there is a break between the sign and the referent, for the sign can only refer to other signs. Underlying these ideas is the basic assumption that language precedes thought, or at the very minimum, that they are symbiotic creatures. All but the most basic of thoughts requires language to exist; as such, every idea depends upon the linguistic structures that are responsible for its creation. Every text then, despite efforts to describe “some external reality, is secretly casting a sideways glance at its own process of construction.”⁸ Such construction then becomes the center of discussion, as opposed to the external reality which is struggling to reveal itself.

The act of treating language as a self-referential system makes for some very self-conscious writing. Terry Eagleton describes the move from New Criticism to structuralism quite eloquently: “Writing turns on itself in a profound act of narcissism, but always troubled and overshadowed by the social guilt of its own uselessness.”⁹ Inevitably, structuralist theories weaken the power of language. If language can only talk about language, then its ability to discuss greater meanings is

strongly hindered, if not eliminated entirely. In some regard, structuralism was pulling the rug out from underneath itself, by using language to critique language. A certain amount of lucidity developed in which the theorists became increasingly aware of the limitations of language. The question begged itself: isn't the language of criticism subject to the same analyses that have been applied to literature? Doesn't *this* language suffer the same limitations? If literature is forced to acknowledge the frailties of its own existence, then isn't criticism obligated to do the same?

Such narcissism is frequently fear inducing, for it necessarily flirts with self-destruction. But with Derrida's arrival, the reaction towards this process developed from one of hesitation to that of embracing a necessary evil. Poststructuralist theories turned the structuralist analyses into the source to be criticized. Mimicking the structuralist search for the inherent assumptions in a work of literature in order to determine their use and construction, poststructuralism looked for the assumptions underlying structuralist criticism itself. Where structuralism looked at literature, poststructuralism looked at structuralism, with both frightening and liberating results.

The first concept to come under fire was the notion of structure itself. Structuralism perpetuated the idea of opposing relationships between words; deconstructionist critics easily demonstrate that such oppositions aren't really opposing; ideas that seem superficially at odds with one another can be "deconstructed" to reveal their similarity. Look in the dictionary for the definition of a term and you find more terms in need of looking up. They of course evoke more terms, and the evocation continues on infinitely. There is no end to the process of signification, no signifier which is not also a signified. Rather than a kind of equality between signifier and signified, there is suddenly the appearance of a much more complex relationship. The notion of clean differences with which Saussure claimed words maintained their meaning is undermined. Every word doesn't designate itself separate from every other; in fact, every word refers to every other word, and in an infinite number of ways. The concept of structure falls apart under only a very little scrutiny; what had appeared to be a tidy correlation between signifier and signified now reveals itself to be a rather chaotic web of meaning, where everything is dependant on everything else.

Meaning, then, is an elusive creature. We can never really come to a conclusion as to the explicit meaning of a word; we will always be referring to other words and on and on down the "chain of meaning."¹⁰ There is no end to such searching, no single word or concept which can serve as the foundation for all the

others; in Derrida's words: "the absence of a transcendental signified extends the domain and the interplay of signification *ad infinitum*."¹¹ There is then no "signifier equals signified" equation; the reality is more analogous to the signifier approaching the limit of an infinite series of signifieds. Unfortunately (or fortunately depending upon the perspective) no such limit exists.

Derrida invents the word *différance* to explain the rift that has now developed between signifier and signified. The term balances between the two ideas of the verb *différer*, which means both "to defer" and "to differ." The sign serves as a substitute for the thing it refers to; when we cannot physically get our hands on the thing itself, we put a sign in its place. In this regard, there is a deferral of meaning, or a temporization of meaning. But there is also a spacing; the sign is not exactly the thing which it refers to: "the signified concept is never present in and of itself...every concept is inscribed in a chain or in a system within which it refers to the other...by means of a systematic play of differences."¹² The term *différance* then stands for this break between the signifier and the signified, a coupling of temporal spacing (deferral) and physical spacing (differing).

In contrast to the structuralist determination to discover oppositions in texts and demonstrate their function, the deconstructionists reveal that such oppositions are actually impossible. There can be no concepts standing in opposition to one another, for each "element [i.e., word] appearing on the scene of presence, is related to something other than itself, thereby keeping within itself the mark of the past element, and already letting itself be vitiated by the mark of its relation to the future element."¹³ Deconstructive criticism then takes on the mission of demonstrating how texts come to contradict themselves; in any attempt to set up a structure of meaning, that structure is ultimately seen to fail. Every text admits of this failure, whether it cares to or not.

With these ideas, Derrida undermines the basic concepts of structuralism and even puts the notion of "meaning" under fairly harsh light. But to step from such a statement to the conclusion that his theses affirm the impotence of all language (as Gross and Levitt do) is to take greater license with his ideas than was granted: "the widespread opinion that deconstruction denies the existence of anything but discourse, or affirms a realm...in which all meaning and identity dissolves, is a travesty of Derrida's own work and of the most productive work which has followed from it."¹⁴ Derrida never claims that language is incapable of meaning; the fact that he attempts and succeeds in communicating his ideas to others is an implicit denial of such a

stance. Nor do his ideas deny the existence of any objective reality; they merely point to that reality's connections with language and bring them out in the open to be questioned. Though it is certainly possible to move from the tenets of deconstruction to the nihilistic impulse to deny the possibility of any meaning, such a move misses the point. Derrida's texts are replete with the notion that deconstruction is an act of freedom, not one which ties us to immobility: "literature is now less an object to which a criticism must conform than a free space in which it can sport."¹⁵ That is, rather than merely communicating the ideas of its author, literature is also capable of revealing assumptions and contradictions inherent to language itself, and creates a forum for the discussion of such linguistic quandaries. There is no denial of meaning here; there is, in fact, an affirmation that there is much more meaning to be found than ever previously dreamed.

Derrida quite explicitly dictates the realm in which his theories are useful, and indicates such usage: "Thus one could consider all the pairs of opposites on which philosophy is constructed and on which our discourse lives, not in order to see opposition erase itself but to see what indicates that each of the terms must appear as the *différance* of the other."¹⁶ That is, Derrida suggests we must take responsibility for our language, must be conscious of its limitations and take them into account at all times. He does not suggest doing away with language given its limitations; quite the opposite: he says "*there is no sense in doing without the concepts of metaphysics in order to attack metaphysics.*"¹⁷ Similarly, there is no sense doing without language in order to attack language; but neither does this declare the attack useless: "Here it is a question...of a critical responsibility of the discourse. It is a question of putting expressly and systematically the problem of the status of a discourse which borrows from a heritage the resources necessary for the deconstruction of that heritage itself."¹⁸ The self-consciousness that began with structuralism is here reaffirmed and heralded as a crucial responsibility.

Derrida uses the work of Levi-Strauss to further discuss such obligations. In his text, *The Elementary Structures of Kinship*, Levi-Strauss begins by defining the terms "universal" and "cultural" in opposition to one another; he uses universal to refer to things that belong to nature and don't depend on any particular culture, and cultural to refer to regulating norms specific to individual societies. Neither of these definitions is original; they existed in relatively the same form decades prior to Levi-Strauss' use of them. But when he begins to use such terms in their traditional states, Levi-Strauss quickly discovers what he refers to as a "*scandal*, that is to say, something

which no longer tolerates the nature/culture opposition he has accepted and which seems to require *at one and the same time* the predicates of nature and those of culture. This scandal is the *incest-prohibition*.”¹⁹ It is at once universal (it belongs to all cultures) and cultural (it is a norm regulating society). It would seem that the terms universal and cultural as they have been defined are no longer sufficient. Nevertheless, Levi-Strauss continues to use them, having determined that such distinctions (though perhaps not completely adequate) remain necessary to his discussions. He then discovers “the necessity of utilizing this opposition and the impossibility of making it acceptable.”²⁰ He must use terms which he admits to being easily deconstructed, but whose construction he finds infinitely necessary.

The act of admitting the possibility of deconstruction is the crucial point. It is not to say that the deconstruction of concepts eliminates their utilitarianism or necessity. Rather, it is that such deconstruction serves as a constantly present criticism. Given the instability of language, and the difficulty (and likely impossibility) of constructing terms invincible to deconstruction, it becomes evident that “language bears within itself the necessity for its own critique.”²¹ Writing then becomes a complicated process, for the text must reveal both the meanings it purports to be true, and a criticism of the construction of these meanings. Postmodern literature is by nature dense, thickly referential to both external ideas and internal quandaries of its own creation. It frequently demands a critics’ eye to complete it, and in fact criticism becomes a kind of literature itself. The discipline is then expanded, granted the power both to revisit old texts in search of new ideas, and to deal with new texts in manners previously unheard of.

Though the result of this is in some regards confusing (the line between literature and criticism is now blurred beyond recognition), it is also liberating and frequently delightful. Despite efforts to discover a subtle nihilism running beneath Derrida’s works, he consistently reveals quite the opposite. When referring to the freeplay of language and criticism now possible, he expresses euphoria, not despair. There is no evidence of nihilistic skepticism and no depressing denial of all existence. In reference to his deconstruction he states: “we must think this without *nostalgia*...we must *affirm* this, in the sense in which Nietzsche puts affirmation into play, in a certain laughter and a certain step of the dance.”²² Language and literature are an adventure, a game, albeit one with no conclusion or promise of award. But certainly the loss of a win or lose situation is not to be mourned; the most illuminating searches are always the ones that never conclude.

The criticism against Derrida remains, however, and most of it results from misinterpretations of his texts. Derrida directly responded to such criticisms in his 1966 presentation at Johns Hopkins University of the paper “Structure, Sign, and Play in the Discourse of the Human Sciences.” A member of the audience questioned Derrida about the apparent irresponsibility of his ideas, and alluded to what seemed to be their ability to destroy everything in their path. Derrida responded with:

Here or there I have used the word *déconstruction*, which has nothing to do with destruction. That is to say, it is simply a question of (and this is a necessity of criticism in the classical sense of the word) being alert to the implications, to the historical sedimentation of the language which we use—and that is not destruction. I believe in the necessity of scientific work in the classical sense, I believe in the necessity of doing everything which is being done and even of what you are doing, but I don't see why I should renounce or why anyone should renounce the radicality of a critical work under the pretext that it risks sterilization of science, humanity, progress, the origin of meaning, etc. I believe that the risk of sterility and of sterilization has always been the price of lucidity.²³

It seems that Derrida is infinitely aware of the implications of his ideas, though he himself steadfastly refuses to follow such destructive paths. The fact that his ideas can prove threatening if misused does not support doing away with them. Certainly many philosophical ideas if misused are potentially harmful; this is no proof of their invalidity. The ease with which an idea can be misread or distorted towards injurious ends is not an indictment of the tenuousness of that idea, but rather of the dark sources of the interpreters' motivations.

Gross and Levitt's statements about deconstruction are the unfortunate result of such misguided readings. It would appear that they have read Derrida with the intent to discover an underlying incompetence; in fact, their discovery of such flaws are more indicative of their own motives than anything concerning Derrida's actual work. They cite an example from “Structure, Sign, and Play” that they claim demonstrates willful scientific ignorance on Derrida's part: “The Einsteinian constant is not a constant, not a center. It is the very concept of variability—it is, finally, the concept of the game. In other words, it is not the concept of *something*—of a center starting from which an observer could master the field—but the very concept of the game.”²⁴ Gross and Levitt take this statement to mean that Derrida is denying the validity of special relativity, that he is claiming that the speed of light, despite massive amounts of scientific

evidence to the contrary, is really inconstant and subject to variability. (Sokal and Bricmont, on the other hand, shake their heads and sigh that they have no idea what he's talking about.) Unfortunately, Gross and Levitt's interpretation takes this sentence completely out of context, and so they misunderstand Derrida's intended point.

His statement is actually in response to a question by Jean Hyppolite, who asks if perhaps the Einsteinian constant (the speed of light) is representative of a structural center, of a transcendental signified, the likes of which Derrida has proposed does not exist. Derrida responds that it is not evidence of such a center; in fact, intrinsic to the notion of a "constant" is the idea of "variability"—their meanings are inextricably linked and even rely on every other word in the system of meanings. When he asserts that it is "the constant of the game," he is merely reaffirming the endless play of differences involved in language, the infinite dance from one word to the next. There is absolutely no evidence that Derrida is suggesting that the speed of light isn't really a constant; he makes no reference to any scientific doctrine whatsoever. Rather, his discussion focuses on the linguistic implications of the lack of a center in language. Gross and Levitt's criticism then seems completely irrelevant: Derrida is discussing linguistics, not special relativity.

Much of Gross and Levitt's discussion in *Higher Superstition* is an indictment of the academic left's misuse of scientific dogma. Unfortunately, this is a crime that they are equally guilty of; they misuse Derrida's statements to prove their point in the same way they complain the literati misuse scientific doctrine. Gross and Levitt claim in the first chapter of *Higher Superstition* that "the proliferation of distortions and exaggerations about science, of tall tales and imprecations, threatens to poison the intellectual cohesion necessary for a university to work as anything other than a collection of fiefdoms, trying to avoid each other's concerns—and students—as much as possible."²⁵ Granted, they are certainly correct that petty arguments between the disciplines serve only to weaken the transferal of knowledge and thus have a deeply negative effect on all of academia. But the current runs both ways, and Gross and Levitt's poorly informed attacks on the academic left only aggravate the problem, rather than alleviate it. If their hope is to re-open lines of communication between the disciplines such that neither side is misunderstanding the other, then they have yet to accomplish it.

One of Gross and Levitt's principle concerns is the literati's claim that they have something to say about science: "Postmodernism is, among other things, a device for

amplifying the special insights of a narrow area of literary criticism or rhetorical analysis into a methodology for making judgments of the entire cultural spectrum.”²⁶ They claim (rightly) that when unknowledgeable writers attempt to discuss science, there are potentially devastating consequences. Their principle concern is what they perceive to be a steady current of nihilism running beneath most poststructuralist theories. The belief that language (including scientific language) can only refer to itself would seem to be an indictment of the sciences’ ability to describe an external, objective reality. But what they mistake for nihilism is really a profound self-consciousness on the part of new literary criticism; the field has developed into one which is constantly questioning itself and the philosophical foundations it stands on. Such lucidity strikes Gross and Levitt as destructive, but that is an unnecessary consequence. In actuality, it is a method for evaluating the usefulness and validity of a theory; science is capable of making measurements external to its theories in order to evaluate such theories; literary criticism is incapable of such external judgment, and has thus developed a kind of self-evaluative narcissism. There’s no intentional nihilism in this act; true nihilism has never been (and likely never will be) a generally accepted practice in any circle. Its usefulness is far too limited.

Gross and Levitt seem to think that the academic left has nothing at all useful or intelligent to say about science, and so resent its intrusion into scientific territory. But if postmodernism claims to have some basis for discussing science, it is because postmodernism focuses on *language*, and science is by no means immune from the quandaries of linguistics. If anything, modern physics is complicit in the deconstructionist move to break down binary oppositions and demonstrate the inherently unstable, inadequate nature of the language we use. Much of modern physical explanations in fact rely on such tactics, particle-wave duality being the prime example. The traditional definitions of “particle” and “wave” exclude each other; it is not possible for a single entity to exist as both simultaneously, given the accepted notions of each. But they are important concepts, and cannot be done away with. We need the ability to discuss particles as things that aren’t waves, and waves as decidedly non-particle like objects; but at the same time, we require an explication of something that can be both. In much the same manner that Levi-Strauss holds on to the terms “universal” and “cultural” while maintaining their limitations, physics clings to the separate concepts of particle and wave, while admitting that there are exceptions. Derrida argues that when such a criticism is admitted, there develops a necessary reflection on the terms’ use: whoever then refers to such terms must “remain faithful

to this double intention: to preserve as an instrument that whose truth-value he criticizes.”²⁷ That is, our definitions of particle and wave seem to be incomplete, for they are incapable of completely describing the phenomena of light; but their utility is not brought into question by this act. They are necessary, despite the criticism they are obligated to evoke.

What is notable here is the notion of being responsible to one’s discourse, and this is hardly an alien idea in the sciences. The emphasis on repeating experiments and clearly defining terms in physics is a reaction to the need for the discipline’s responsibility. Literary theory and philosophy have quite a different approach, given the inability to “measure” their ideas. There is no method by which they can test their theories against an external world, and thus the source for evaluation then becomes themselves. Philosophy, literary theory, and metaphysics then question themselves through their own texts, in much the same way that poststructuralism questioned structuralism by first accepting the ideas it perpetuates. The impetus is *not* to destroy the field in question (for that would mean simultaneously destroying the foundation for the criticism), but rather to expose the assumptions and limitations inherent to a dogma such that they may be evaluated and discussed. It’s a bit like pointing out the fact that you have a hole in your shoe, while admitting the lack of finances to purchase a new pair. Your ability to traverse puddles and rocky surfaces is limited, but you have to do with what you have. It’s always best to be aware of your limitations, regardless of whether or not you’re capable of doing anything about them.

Poststructuralism (and deconstruction in particular) is then highly narcissistic and flirts with nihilism (though it by no means embraces it). It stands in a rather strange dimension where it is both a criticism and the source of its own criticism, the proverbial snake eating its tail. This is not an admission of fault; it is, rather, the only method by which this kind of discussion can take place. Once one grants that language is replete with instabilities and intrinsically self-referential, the necessity for being responsible to such limitations becomes manifest. Though the method by which these limitations are discussed appears at first unnecessarily complex and perhaps even paradoxical, it is actually perfectly adapted to its subject and the paradox is inescapable: language serves both as the genitor of criticism and the substance by which such criticism is constructed. This is a labored and incomplete birth, and any discussion of it necessarily reflects this fact.

Perspectives

Deconstruction then finds its niche in the notion of being responsible to a naturally complicated and contradictory discourse; it serves as a source of unrest, not in the sense that a peace is rudely disturbed, but in that no peace is permitted which survives on the suppression of protest. It is a necessary, if unnerving, criticism. But surely this idea is not alien to the sciences; physics is unfailingly defensive of its discourse, only permitting truths which have surpassed a variety of very high standards, and only when the act of surpassing them has been shown to be independent and without error. No new information is allowed to enter the canon which hasn't been proven by experiment after experiment, and even then it is accepted gingerly, like a child accepting candy from a stranger: intrigued, but wary.

Deconstruction and the standards of scientific research are parallel, though very different, responses to the same need to maintain a critical responsibility to the discipline. Physics approaches this obligation with rigorous experimental methods, replete with demands for repetition and corroboration. Literary and philosophical theories, however, are not privileged to the same kind of physical experiments; they do not have access to a system which exists independent of their ideas and can be used as a tool for comparison or evaluation. Any such system is necessarily viewed through the filter of philosophical ideas and thus does not serve as a sterile experimental field. As such, their response to the demand for critical responsibility has been met internally, the source for comparison being its own constituent parts. It is difficult to recognize such acts as methods of responsibility, but this is exactly what they are. Deconstructive ideals, which are constantly prodding and questioning existing philosophical assumptions, serve the same function in philosophy that skepticism and repeated experimentation accomplish in physics.

There are thus two ways to deal with poststructuralism, and deconstruction in particular: the first accepts its status as the potential fulfillment of a critical obligation. This is an admittedly hazardous status, and whether or not deconstruction succeeds in this regard is open to debate. But it certainly makes a valorous attempt, and there is as of yet little else doing the same. The second response to deconstruction is that which Gross and Sokal perpetuate: to dismiss it as tragic, or unintelligible, the bile of a currently vomiting discipline. Certainly this reaction is just as present in literary

circles as it is external to them, but it is useless on either side. Regardless of whether such a dismissal is valid, it serves only to widen the cultural gap and limit intellectual discussion. The virtues of deconstruction are admittedly unclear, but there can be no claim that it has nothing to teach us. To lump it in the pile with nihilism is not merely insulting, but defeating. There's more to be gleaned here, if only we're willing.

It would seem that the source for the debate on these issues is more the result of inter-cultural (and also intra-cultural) miscommunications; in the extreme case, miscommunications are superseded by the failure to communicate at all. Certainly this is a point to be bemoaned, but Gross and Sokal moan a little more than necessary: it's a bit like killing a mosquito with a nuclear warhead. The job is accomplished, but there's not much left afterwards. Sokal and Bricmont do spend a few pages trying to elucidate the sources of such miscommunications, but they do so largely by pointing to yet more warts on the body of the academic left; and they end *Fashionable Nonsense* on an entirely skeptical note, lamenting that likely the left will never pull itself together. They succeed in listing all sorts of troubles plaguing the literati, but Gross and Levitt accomplished that three years earlier and they weren't even the first to say it: Sokal and Bricmont manage only to reemphasize an already bored point.

In fact, Gross and Sokal commit many of the same crimes that they accuse their literati counterparts of committing. They express alarm over the fact that many of the academic left are attempting to write about science with little knowledge of their subject; but by the same token, they have themselves revealed insufficient background in discussions of literary theory. Gross and Levitt completely misunderstand Derrida, among others. Sokal claims not to understand him, but doesn't hesitate to make fun of him regardless. Granted, Derrida's writings are fairly difficult to grasp, but they are by no means impenetrable. To dismiss them either as nonsensical or antiscientific is to succumb to the same ignorance for which Gross and Sokal assault the literati.

Frighteningly, there is something even more deadly than ignorance lurking in the ridicule of Gross and Sokal. In their perpetual demand that only scientists be allowed to talk about science (while, of course, literary and philosophical theory is open to all), they confirm a dangerous scientific elitism which presents a greater threat to science than any potential nihilism on the part of the literati. It is certainly true that in some regard literary theory is going out of its way to be obscure and prove its own uselessness, but the elitism which Sokal (and more pointedly, Gross and Levitt) perpetuate is an equally self-destructive move on the part of the scientists. To claim, either implicitly or explicitly, that half of academia is incapable of understanding

physics is to declare physics unimportant. Physics is not going to retain the high status it has had for so long by convincing its peers that its work is too complex for them to understand. Unfortunately, this attitude is prevalent if not obvious in many scientific circles, and it infects the writings of Gross, Levitt, Sokal, and Bricmont.

What's been lost in these discussions since Snow's arrival forty years ago is the priority given to the *solution* of the problem, as opposed to its detailed identification and classification. Snow spent the better part of the "Two Cultures" lecture discussing education standards and their ability to both exacerbate and alleviate the problem. He pointed out that because science (and mathematics in particular) are not granted the same emphasis in primary education environments as literature and writing, a barrier against understanding physics is built which continues through a student's college education. The mathematical "intuition" that develops with frequent use of math isn't fostered, and so students enter university life with either a disinterested approach towards the sciences, or worse, active distaste and resistance towards learning science. This makes the teaching of science extraordinarily difficult, but it does not make it impossible, nor does it provide an excuse for not attempting to explain science to those who feel they will never grasp it.

Here's the rub: Gross and company are angered by the fact that the academic left repeatedly attempts to understand and write about science, but frequently misses the mark (or, in a few more embarrassing cases, aims in the wrong direction altogether). But this fact is as much an indictment of science's failure to explain its goals and accomplishments as it is of the literati's ignorance. If scientists want the rest of the world to know what they're talking about, they had better take it upon themselves to relay that information, and in a useful manner. This means no dumbed-down accounts of scientific research and no extraordinarily technical papers; the former merely muddies the field; the latter provides sufficient communication within the discipline, but take a fish out of water and it drowns quickly. What is needed is writing that is both intelligent and informative, while also accessible to the educated majority. Unfortunately, this kind of writing has received little or no attention within academic circles.

Partially responsible for the vacuum surrounding this writing is the myth that it simply can't be taught, or even really successfully accomplished. Occasionally, famous physicists manage to pull it off (Stephen Hawking, Richard Feynman), but such achievements are generally viewed as flukes, the result of an uncommon and genius-negotiated talent. This is a harmful idea, and it is decidedly untrue. It is not only

possible to write about physics such that the general public can understand, it is absolutely imperative. No field can survive without justifying itself to those external to it. The attitude that physics is either incapable of explaining itself or at the least under no obligation to do so is suicidal: it limits the number of people interested in physics (note the increasing difficulty with which graduate schools have in recruiting students, and the shortage of capable scientists to staff experiments), it limits the ability to raise funds to support research (a significant portion of physics research is funded through the Department of Energy, that is, through taxpayers' money), and it ultimately belittles physics overall. To say that it is unnecessary to inform people of your research is to silently confirm the notion that your research isn't really accomplishing anything. Clearly this is not an idea which needs to be perpetuated.

The root of this problem speaks more to the cultural divide than anything else: physics must learn how to communicate with the rest of the world, but the people to consult for such advice are the same ones that reside in the infamous and avoided academic left. If the field of physics is going to develop methods for explaining its discoveries to those outside it, then there's no other place to turn. The tools for elucidating science are the same ones used to discuss literature: each is somewhat specialized of course, but the constituent parts are identical. The best physics teachers are always the most well-read; any bright physics student would choose a professor with a developed, mature appreciation for *Hamlet* over a thousand who've never read Sonnet 116. Ultimately, the one with a knowledge of Shakespeare will be more useful as a teacher, regardless of the fact that his or her experience is a thousand times less than the other group. This is not to suggest that there lies some mysterious quality in Shakespeare that makes us better thinkers and teachers; it *is* to suggest that the skills necessary for explicating science and math are the same ones used in literary analysis, and thus far, the literati are doing a better job of teaching it. If physics disavows any contact with the academic left, it is not merely shooting itself in the foot: it's putting a silver bullet through its head.

By the same token, the literati ought to take better notice of the physicists' material. Continued tolerance of ignorant writings on science is unacceptable. Not only does it make the entire academic left look stupid (and this is no small problem) but it contributes to the atmosphere of disregard for the sciences' accomplishments. It is entirely hypocritical for literary intellectuals to publish papers and books on the triviality and insufficiency of scientific discourse, while driving to their university in a working vehicle and typing their ideas on a personal computer. Science has

accomplished quite a lot for us, and we ought to be slightly more grateful. Whatever our philosophical concerns regarding the epistemological foundations of scientific theory (and these are of course not trivial), there can be absolutely no doubt that the accomplishments of physics are great and multiple.

When Snow first coined the “two cultures,” he did so under the veil of an extraordinary optimism. He suggested that not only would the cultures gradually come together with merging objectives, but that such a union would result in the spread of the industrial revolution and the elimination of global poverty. Nice sentiments both, but too infected with naïve idealism for most of us to accept. And given that quite a lot of time has passed with little evidence of improvement, his optimism doesn't seem to have been vindicated. Attitudes prevalent on both sides continue to widen the gap, despite the fact that their philosophies are not necessarily at odds. It would seem that, for whatever reason, members of both sides are intent on finding issues which split the cultures rather than bring them together. The impetus behind such divisiveness is unclear: possibly the literati are reacting to the financial security that the physicists possess and they lack; possibly the physicists are reacting to the title of “intellectual” that the literati have usurped; or perhaps the general problem is that of post-WWII culture and its incessant desire to confuse, disrupt, and prove itself chaotic. Regardless of the reasons (and they are likely multiple and intertwined), the problem remains.

Epilogue

This project stems in large part from my personal academic experience. As a double-concentrator in Physics and English, I navigate the bridge between the two cultures on a daily basis. I have participated in two experimental physics fellowships at Thomas Jefferson National Accelerator Facility, while at the same time taking classes on Shakespeare, modern poetry, creative nonfiction, American noir, and literary theory, among others. My experience has shown that the state of affairs between the cultures is actually much less foreboding than Gross and Sokal depict, but no where near as positive as Snow would have hoped. Most of us pay no attention to the divide; those of us that do quickly learn that it is possible to remain loyal to the major tenets of both disciplines without succumbing to schizophrenia or physically partitioning our brains. There are certainly border skirmishes now and again, but by and large the ideals of both reside in relative harmony.

It would seem then that the sources of inter-cultural arguments are by nature political rather than philosophical. There exists no fundamental conflict which prevents both sides of the divide from accepting one another. The initial goal of this project was to explore one locus where the debate seemed strongest and least capable of resolution, in order to determine whether or not a convergence of ideas was even theoretically possible. My conclusion as to this regard is an emphatic yes: yes these ideas are compatible, yes it is possible to accept both of them, yes each side has something to teach the other. The conventional myth that it isn't feasible to be a literary intellectual and a scientist at the same time is just that: mythic. There are (I believe) rising numbers of us proving it wrong.

Of course the question remains: where does this leave us? Having granted that the divide is more a result of miscommunications and political backbiting than anything relating to doctrine, what remains to be done? At this point, it would seem that greater and more cooperative examinations of such debates are called for; Gross, Levitt, Sokal, and Bricmont begin this push, but they by no means exhaust it. I would argue that they haven't started things out as convivial as they should have, but presently that's water under the bridge. They've succeeded in bringing attention to the divide, and now opportunities exist for analyzing its existence, illuminating how various rifts developed, finding places where the path is easy to cross and others where

it's strenuous. There is a lot to be learned about both sides in such a process, and I am convinced that we will find no point where the space is impassable.

I would like to conclude this paper with what I believe should be the morning prayers of those who proceed to walk the cliffs. It will always be noted without debate that those of us who dedicate our lives to studying literature see things a little bit differently than those of us who study science. For the few in the middle, we frequently suffer from double-vision; occasionally, we are fortunate enough to experience moments where the images converge and we can briefly see with incredible depth. Over time, we notice more similarities than differences—the view comes into focus with increasing ease. To our thankful delight, the image is remarkably rich. It should not be missed.

Notes:

1. Gross 1994, 87.
2. Ibid., 76.
3. Sokal 1998, 213.
4. Eagleton 1996, 84.
5. Selden 1985, 73.
6. Ibid., 18.
7. Eagleton 1996, 84.
8. Ibid., 91.
9. Ibid., 122.
10. Derrida 1982, 11.
11. Derrida 1970, 249.
12. Derrida 1982, 11.
13. Ibid., 13.
14. Eagleton 1996, 128.
15. Ibid., 119.
16. Derrida 1982, 17.
17. Derrida 1970, 250.
18. Ibid., 252.
19. Ibid., 253.
20. Ibid.
21. Ibid., 254.
22. Derrida 1982, 27.
23. Derrida 1970, 271.
24. Gross 1994, 79; and Derrida 1970, 267.
25. Gross 1994, 7.
26. Ibid., 75.
27. Derrida 1970, 255.

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